

DOCKETED	
Docket Number:	21-BSTD-01
Project Title:	2022 Energy Code Update Rulemaking
TN #:	240693
Document Title:	Public Comments and Responses to the Proposed Revisions to 2022 Title 24, Part 1 and Part 6
Description:	N/A
Filer:	Javier Perez
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	11/22/2021 6:40:53 PM
Docketed Date:	11/22/2021

Comment Numbers	Commenter and/or Copy of Comment Language (mainly for Legal Office Use, will be removed from final submission)	Comment	The Commission's Response to the Comment	Date of Comment	Phase	Title or Other Description of Comment (link to docketed comment if possible)
237048.001	Sean McCarthy and Jatin Khanpara (Anden)	We believe the commission should reevaluate this section (Appendix X1 to Subpart B of 10 CFR Part 430) because Appendix X1's classification of units as either whole-home or portable dehumidifiers make their test methods seemingly incompatible with the CEH industry and the stated intent of the CASE Team.	"Stand-alone" was removed from definition of dehumidifiers to be consistent with the Fed definition of this equipment. All dehumidifiers will be subjected to the same testing procedures.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.002	Sean McCarthy and Jatin Khanpara (Anden)	Appendix X1 defines dehumidifiers as either "whole-home" or "portable" and use conditions different than those communicated to stakeholders during CASE Team stakeholder engagement sessions.	"Stand-alone" was removed from definition of dehumidifiers to be consistent with the Fed definition of this equipment. All dehumidifiers will be subjected to the same testing procedures.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.003	Sean McCarthy and Jatin Khanpara (Anden)	Appendix X1 testing under the 'whole-home' dehumidifier test method requires the use of a 10" duct and 0.2" of static pressure neither of which represent realistic or compatible testing methods for CEH stand-alone dehumidifiers.	"Stand-alone" was removed from definition of dehumidifiers to be consistent with the Fed definition of this equipment. All dehumidifiers will be subjected to the same testing procedures.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.004	Sean McCarthy and Jatin Khanpara (Anden)	Appendix X1 testing under the 'portable' dehumidifier test method is incompatible with the stated CASE team goals of not using AHAM 2017.	We appreciate the commenter pointing out how the test is incompatible with the CASE team's goals. However, upon evaluating the proposal and submitted comments, we decided to use Appendix X1 as the required testing procedure in order to be consistent with Federal requirements.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.005	Sean McCarthy and Jatin Khanpara (Anden)	Appendix X1 on the whole deviates away from the CASE Team's goal of aligning more closely with other locales.	We appreciate the commenter pointing out how the test is incompatible with the CASE team's goals. However, upon evaluating the proposal and submitted comments, we decided to use Appendix X1 as the required testing procedure in order to be consistent with Federal requirements.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.006	Sean McCarthy and Jatin Khanpara (Anden)	We propose that the commission: Revise the wording to incorporate Appendix X to Subpart B of 10 CFR Part 430 instead of Appendix X1.	The phrase Subpart B of 10CFR Part 430 is now included.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.007	Sean McCarthy and Jatin Khanpara (Anden)	We propose that the commission: Include additional language into the Energy Code to clarify the testing conditions from Appendix X1. These terms should at a minimum: (A) Specify testing conditions of 73° DB / 60% RH and 0" static pressure for all dehumidifiers. (B) Exclude any 10" Ducting required in Appendix X1; and (C) Clarify that all other conditions applicable to whole-home dehumidifiers are applicable even if the dehumidifier would otherwise meet the definition of "portable" under Appendix X1.	Thank you for the comment. We decline to modify Appendix X1 to Subpart B of 10CFR Part 430, as it is consistent with a federal test procedure.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.008	Sean McCarthy and Jatin Khanpara (Anden)	The 2022 terms define "stand-alone dehumidifiers" in a manner consistent with ANSI/AHAM DH-1 2008 but inconsistent with Appendix X1 which splits units into either "whole-home" or "portable" dehumidifiers and features two different test methods (See Section 4.1.1). Because the definitions do not match and the CASE report does not discuss which definition from Appendix X1 is more applicable for CEH dehumidifiers, the application of Appendix X1 is difficult and confusing.	"Stand-alone" was removed from definition of dehumidifiers to be consistent with the Fed definition of this equipment. All dehumidifiers will be subjected to the same testing procedures.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170
237048.009	Sean McCarthy and Jatin Khanpara (Anden)	Because of the lack of a clear definition and no definitive clues from the CEH CASE report, the Terms as written leave manufacturers, building code inspectors, test labs, and others guessing as to which definition is more applicable and how testing should be conducted.	Dehumidifiers are defined in Section 100.1.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238170

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237048.01	Sean McCarthy and Jatin Khanpara (Anden)	Appendix X1 Test Conditions are incompatible with communicated conditions during stakeholder engagement sessions. The test conditions in Appendix X1 are dissimilar to those presently used in the industry. Appendix X1 section 4.1.1 specifies the following: (A) 73° DB / 60% RH – whole-home dehumidifiers; or (B) 65° DB / 60% RH – portable dehumidifiers conditions (consistent with AHAM 2017) As opposed to: (C) 80° DB / 60% RH – All dehumidifiers AHAM 2008 and Appendix X.	Thank you for the comment. We decline to modify Appendix X1 to Subpart B of 10CFR Part 430, as it is consistent with a federal test procedure.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238170
237048.011	Sean McCarthy and Jatin Khanpara (Anden)	We note that on April 16, 2020, the CASE team stated its goal of setting a target IEF of 1.9 L/kWh at 80° F / 60% RH conditions in response to a question from another manufacturer. While the Final CASE Report explains why the commission chose to move away from the initial the 1.9 L/kWh target and create two different targets based on unit size, we find no explanation in the final report for the change in environmental test conditions or any related stakeholder input.	Thank you for the comment. We decline to modify Appendix X1 to Subpart B of 10CFR Part 430, as it is consistent with a federal test procedure.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238170
237048.012	Sean McCarthy and Jatin Khanpara (Anden)	The Whole-Home Units test method is incompatible with ductless units. For whole-home dehumidifiers, Appendix X1 requires 10" ducting and measurements at 0.2" of static pressure. This method seems wholly inappropriate for CEH dehumidifiers since many do not operate with any ducts or static pressure. Further, the 10" ducting alone would likely bring many units above the required 0.2" of static pressure; this is before any transitions or additional modifications manufacturers would need to make to install a 10" duct on very large units are considered.	Thank you for the comment. We decline to modify Appendix X1 to Subpart B of 10CFR Part 430, as it is consistent with a federal test procedure.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238170
237048.013	Sean McCarthy and Jatin Khanpara (Anden)	The Portable Units test method is incompatible with stated goals of the Final CEH Report. Section 2.2.4.4 of the Final CASE Report indicates that the CASE team wanted to align closely with ANSI/AHAM DH-1-2008 instead of AHAM DH-1 2017 because the 2017 edition "was designed only for portable dehumidifiers with low daily capacity". Yet, for portable units, Appendix X1 describes a test procedure similar to that found in AHAM 2017. (See Attachment A which compares the two methods). We therefore infer that using the portable test conditions of Appendix X1 would not be appropriate.	We appreciate the commenter pointing out how the test is incompatible with the CASE team's goals. However, upon evaluating the proposal and submitted comments, we decided to use Appendix X1 as the required testing procedure consistent with Federal requirements.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238170
237048.014	Sean McCarthy and Jatin Khanpara (Anden)	Using Appendix X1 deviates away from other locales. The CASE Team's report refers to existing City of Denver regulations which the Team originally sought to emulate and align with. The CASE Report notes that the city of Denver uses Appendix X of the CFR, yet Section 120.6(h) of the proposed code refers to Appendix X1.1 While we agree that divergence from the City of Denver was necessary for the different sizes of dehumidifiers, the adoption of a new testing method is unexplained throughout the Final Case Report.	Thank you for the comment. We decline to modify Appendix X1 to Subpart B of 10CFR Part 430, as it is consistent with a federal test procedure.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238170

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237048.015	Sean McCarthy and Jatin Khanpara (Anden)	We suggest that . . . the commission revises the wording to incorporate Appendix X instead of Appendix X1. Using Appendix X to Subpart B of 10 CFR 430 which incorporates AHAM 2008 by reference would unambiguously clarify the test conditions because Appendix X does not split units into whole-home or portable units. This also aligns the Terms with the current method of calculating IEF used in the industry and the conditions communicated to stakeholders during engagements.	Thank you for the comment. We decline to modify Appendix X1 to Subpart B of 10CFR Part 430, as it is consistent with a federal test procedure.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238170
237048.016	Sean McCarthy and Jatin Khanpara (Anden)	Alternatively, we propose that . . . the commission clarifies the testing conditions under a whole-home dehumidifier standard. We are not opposed to adopting the environmental conditions defined in Appendix X1 for whole-home dehumidifiers. However, we do ask that language around the exclusion of ducting and static pressure be included into the Energy Code to avoid confusion from testing agencies as these requirements are not applicable to unducted standalone dehumidifiers.	Thank you for the comment. We decline to modify Appendix X1 to Subpart B of 10CFR Part 430, as it is consistent with a federal test procedure.	6/10/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238170
237782.001	Bil Woodbridge	The CEC 2022 code does not go far enough towards requiring all-electric buildings. It needs to be much stronger to achieve the state's goals of carbon and methane reduction in our atmosphere	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/12/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=237782
237787.001	Sage Phoenix	Thank you for your attention to Title 24 Building Codes to go all electric for 2022! This is definitely a step in the right direction and will help to encourage others to follow the lead of all electric construction. However, the 2022 code does not go far enough to require all-electric buildings, as we've been advocating for over the past year. We need the CEC to issue a public statement to commit to an all-electric code for ALL new buildings in the upcoming 2025 code cycle. Thank you for your on going support in energizing our future with SMART leadership strategies and policies!	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/12/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=237787
237837.001	Bob Koslowsky	Most Californians have come to realize that the loss of electric power during hot summer days or red flag warning days isn't due to poor planning, but is a result of this reliance on solar and wind energy, which disappears as the sun sets or the winds calm. This has led to electric grid instability.	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEPR and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=237837
237837.002	Bob Koslowsky	Please repeal the 2019 Building Code making all-electric residential construction a mandate.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=237837
237837.003	Bob Koslowsky	All-electric mandates should not be made jointly with all-electric automobile (EV) mandates in order to force nighttime charging just to maintain the state's electric grid. Therefore, mandatory battery backup systems should not be included in the proposed 2022 Building Code.	The 2022 Energy Code does not contain an all-electric mandate. Natural gas appliances may still be installed via the performance pathway. Furthermore, the comment appears to discuss residential battery systems; the 2022 Energy Code does not require battery storage systems for residential buildings, only for nonresidential buildings.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=237837

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237837.004	Bob Koslowsky	Resiliency, choice, flexibility, and safety are best served by allowing residents to enjoy the services of natural gas, gasoline, and electric	Thank you for the comment. The adopted building standards do not mandate the use of any specific equipment, including heat pumps, or otherwise ban the installation or use of gas water heaters, furnaces, or boilers.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.005	Bob Koslowsky	It has become clear during the last few years that the increased penetration of solar and wind energy – called distributed energy resources or DERs – has destabilized the electric grid, even as reliable and centralized nuclear and natural gas electric production has been shuttered	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEPR and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.006	Bob Koslowsky	To offset this loss of continuous energy production capabilities, both utility-scale storage and soon-to-be-mandated building battery backup systems have to fill the breach. Impractical, high-capacity battery storage has become a requirement just to replace the buffer capacity provided by natural gas generators.	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEPR and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.007	Bob Koslowsky	All new construction must include an undersized rooftop solar system and, in the near future, all existing structures will be required to undergo costly six-figure upgrades to comply with the associated all-electric mandates.	Staff disagree with this comment. The PV requirement in the energy code require a PV system that exactly offset the anticipated kWh of the building. It is neither undersized or oversized. It is also relatively easy and inexpensive for the owner to add extra PV panels in the future. Also, contrary to the comment, there is not an all electric requirement for existing buildings.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.008	Bob Koslowsky	Soon, more garage space will be sacrificed under state mandates to include both an Electric Vehicle (EV) charger and a wall-mounted battery backup system, connected to the rooftop solar system with a custom-fit, elaborate energy management system	Contrary to the comment, there is no State requirement for the installation of EVSE or battery backup system in single family buildings	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.009	Bob Koslowsky	This added complexity (EV charges and wall-mounted battery backup systems) gives the state/utility provider the ability to remotely connect your mandated EV to the electric grid. All of a sudden your new EV, with its rechargeable battery, becomes a required element in the state's vehicle-to-grid (V2G) network. Your investment is no longer yours, since the degradation of the battery, as it goes through numerous discharges and recharges on a daily basis, is just part of keeping the electric grid stable to avoid brownouts and rotating blackouts.	Thank you for the comment. However, this comment regarding EV and V2G issues are outside the scope of this rulemaking.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.010	Bob Koslowsky	The added strain on an aging electric grid is exacerbated by the move to all-electric construction, the requirement for all-electric home appliances, the legalization of power-hungry (and water hungry) cannabis grows, and the two-direction requirement of sending power back and forth between all connected structures across smaller and smaller distributed networks.	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEPR and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.011	Bob Koslowsky	Efficiency gains are lost by shuttling power back and forth (wheeling) among distribution networks and long-distance electric networks.	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEPR and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.012	Bob Koslowsky	The grid is already beginning to creak as evidenced by outages both big and small (ones usually not even noticed by users, but detected by their electric appliances).	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEPR and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237837.013	Bob Koslowsky	What happens with California's misguided electrical strategy when it inevitably leads to a greater frequency of blackouts and brownouts, and further electric grid instability?	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEPR and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837

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237837.014	Bob Koslowsky	What will happen to the distribution grid when all 12 million homes in California and its 20+ million cars become all-electric?	Thank you for the general comment. However, the comment is outside the scope of this rulemaking. Please see the latest IEP and relevant CEC/CPUC proceedings to learn more about this topic.	5/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237837
237846.001	Aaron Phillips (Asphalt Roofing Manufacturers Association)	This concept was first introduced during this rulemaking cycle in the Pre-rulemaking Express Terms which were publicly released February 22, 2021. Late introduction of this concept during the rulemaking cycle limits opportunity for thoughtful and thorough vetting of this mandatory provision.	Process comment. Cross-linked in Peter's and Payam's comment logs. This was introduced prior to the 45-Day language, and was presented by staff at the 45-Day Lead Commissioner Hearing. Staff had been in contact with ARMA prior to the release of the 45-Day language.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.002	Aaron Phillips (Asphalt Roofing Manufacturers Association)	By using a U-factor to express the requirement, the proposed provision permits insulation to be located either above or beneath the roof deck. Placement in either of these locations is problematic. Roofing systems of all types are required to comply with requirements of the California building codes in addition to those of the building energy efficiency standards, including requirements related to proper product installation, wind resistance, and fire resistance. Mandating insulation at the roof deck may impact compliance with one or more of those existing provisions, creating conflicts for designers and installers.	The U-factor is derived from JA4, and the original proposal which called for R-4 above deck insulation was revised to R-4 below deck insulation specifically to address ARMA's concerns over asphalt shingles not being able to be install with above deck insulation. The use of U-factors allows for design flexibility. Not everyone will choose to install an asphalt shingle roof, and therefore may opt to install above deck insulation as opposed to below deck insulation.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.003	Aaron Phillips (Asphalt Roofing Manufacturers Association)	Asphalt shingles . . . are designed for installation to a rigid substrate, making insulation on top of a steep-slope roof deck an unsuitable option for an asphalt shingle system. Attempts to install asphalt shingles on a non-rigid substrate may lead to damage of the shingles.	The U-factor is derived from JA4, and the original proposal which called for R-4 above deck insulation was revised to R-4 below deck insulation specifically to address ARMA's concerns over asphalt shingles not being able to be install with above deck insulation. The use of U-factors allows for design flexibility. Not everyone will choose to install an asphalt shingle roof, and therefore may opt to install above deck insulation as opposed to below deck insulation.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.004	Aaron Phillips (Asphalt Roofing Manufacturers Association)	California building codes require asphalt shingle installation in accordance with manufacturer instructions, which prescribe application to a rigid deck. Therefore, the proposed new language creates a conflict with provisions of the existing building codes. Use of a U-factor to express the requirement creates opportunity for misinterpretation with unintended consequences such as those described herein.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.005	Aaron Phillips (Asphalt Roofing Manufacturers Association)	Installation of asphalt shingles onto insulation instead of a rigid substrate affects critical performance characteristics of the installed system. Additional study is advisable before mandating such a widespread design change.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.006	Aaron Phillips (Asphalt Roofing Manufacturers Association)	Wind resistance may be compromised (by installation of asphalt shingles onto insulation instead of a rigid substrate) due to inadequate nail holding ability when fasteners are driven into insulation instead of a proper deck sheathing material.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.007	Aaron Phillips (Asphalt Roofing Manufacturers Association)	There are potential adverse effects on the fire classification of the installed asphalt shingle roofing assembly when insulation is positioned between the roof deck and the asphalt shingles. Although there are prefabricated products that combine a rigid substrate with insulation, evaluation of such installations may be limited with respect to fire classification.	The proposal is based on below deck insulation, which would be protected by the roof deck, and conforms with the CA Fire Code regulations.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846

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237846.008	Aaron Phillips (Asphalt Roofing Manufacturers Association)	Placement of insulation on the underside of the roof deck interferes with continuous, free-flow ventilation beneath the roof deck surface, leading to higher exposure temperatures for the asphalt shingles and the potential for moisture buildup within the attic space, both of which may impact system durability and disadvantage consumers who select asphalt shingles as their preferred roof covering.	This is addressed in the Residential Compliance Manual. Requirements are in compliance with the CBC, Part 2, Volume 1 of 2, Chapter 12, Section 1202.2. There are also exceptions to the mandatory roof deck requirement if the ducts are located within the conditioned space.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.009	Aaron Phillips (Asphalt Roofing Manufacturers Association)	The new provision (Section 150.0(a)1) may alter the product selection paradigm for consumers and is expected to discourage some consumers from making the highest value choice for their roof covering material.	There are exceptions to the mandatory roof deck requirement if the ducts are located within the conditioned space.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.01	Aaron Phillips (Asphalt Roofing Manufacturers Association)	Regardless of the roof covering selected, the proposed new provision (Section 150.0(a)1) will cause building owners to absorb significantly higher construction costs attributable to the extra labor and materials associated with insulation installation at the roof deck level, which is a more complicated and challenging process than placement of insulation at the ceiling level. Whether these higher costs will be returned to owners via energy savings is uncertain.	High performance attics, which is based on R-13 or R-19 below deck insulation, were shown to be cost-effective to the homeowner over the life of the building.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.011	Aaron Phillips (Asphalt Roofing Manufacturers Association)	ARMA is not aware of any publicly available, peer-reviewed studies that consider the ability of the wide variety of attic designs permissible under the proposed language to properly dissipate moisture that enters the attic, either through exchange with the exterior via openings into the attic space or occupant-generated moisture that rises into the attic.	Study by Ian Walker and UC Berkley on ventilated vs. unventilated attics showed that below deck insulation in a ventilated attic does not change the moisture accumulation.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.012	Aaron Phillips (Asphalt Roofing Manufacturers Association)	The lack of substantiation that the proposed language will lead to attics that properly manage moisture constitutes an undefined, unnecessary, and unacceptable risk for California homeowners and building owners that must not be ignored, given the potential for adverse health and environmental consequences for building occupants if mold and mildew growth occurs. In extreme cases, moisture accumulation can lead to accelerated deterioration of building components, causing unwanted financial consequences for owners.	Study by Ian Walker and UC Berkley on ventilated vs. unventilated attics showed that below deck insulation in a ventilated attic does not change the moisture accumulation.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846
237846.013	Aaron Phillips (Asphalt Roofing Manufacturers Association)	Although ARMA recognizes and appreciates the efforts of the CEC staff and CASE team members to identify options that improve the energy efficiency of California buildings, we oppose the proposal to mandate roof deck insulation. Mandates such as this that do not appropriately and adequately consider all aspects of design and implementation shortsightedly remove flexibility and often have unintended, detrimental consequences, resulting in both short-term expenses for California homeowners and building owners that may not be offset by supposed benefits, and long-term expenses related to remediation of problems the provisions may create.	There are exceptions to the mandatory roof deck requirement if the ducts are located within the conditioned space.	5/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237846

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237876.001	Ruben Alvarado	I strongly caution you that any type of ban on natural gas for residential or commercial buildings will: 1) Increase energy bills for working families. 2) Kill union jobs. 3) Make our communities more vulnerable to disasters and extreme weather events.	Staff notes that, contrary to the comment, the adopted building standards do not mandate the use of any specific equipment, including heat pumps, or otherwise ban the installation or use of gas water heaters, furnaces, or boilers. The adopted standard does not ban natural gas. The performance path can be used to meet these budgets for mixed fuel homes using other measures. In addition: (1) The record indicates that the adopted standards are cost effective to consumers. (2) CEC staff strongly support the need for an orderly and just transition for pipefitters to make a living as society makes the decarbonization-related changes necessary to avoid and mitigate the catastrophic impacts of climate change, reduce pollution, and address environmental justice concerns. (3) All new gas equipment requires electricity to run. Staff disagree that electric equipment is any more vulnerable to disasters and extreme weather events, since this is not supported by data.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237876
237876.002	Ruben Alvarado	Instead of a reckless push for building electrification, has the Commission considered advocating for an appliance replacement program? The creation of an appliance replacement program, similar to "Cash for Clunkers" to replace outdated gas & electric appliances with environmentally friendly appliances with modern pilotless ignition will immediately reduce GHGs. This program can be completed by Customer Service Representatives who are Utility Worker Union Members and currently perform this work for the Southern California Gas Company. This program would immediately reduce GHGs, expand union jobs, and save tax payers money.	Thank you for the comment. While staff appreciates the comment's creativity, creating an appliance replacement program is well outside the scope of this rulemaking. Staff encourages stakeholders to continue their participation in the 2025 code cycle.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237876
237877.001	Marieantoniette Zapanta	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237877
237878.001	Veronica Amado	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237878
237879.001	Jose Monge	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237879
237880.001	Richard Reyes	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237880
237881.001	Carlos Portillo	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237881
237882.001	Michelle Foster	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237882
237883.001	Fumihito Itokazu	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237883
237884.001	Nathan Solano	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237884
237885.001	Hovhannes Beduryan	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237885
237887.001	Eoin Carroll	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237887
237888.001	Eoin Carroll	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237887.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237888
237889.001	Philip Stewart	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237889
237890.001	Frank Pavon	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237890
237891.001	Tony Duran	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237891

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237892.001	Alfred Mena	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237892
237893.001	Arturo Gallegos	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237893
237894.001	Nicole Winans	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237894
237895.001	Jared Grosskopf	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237895
237896.001	Richard Hernandez	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237896
237897.001	Matthew Arnett	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237897
237898.001	William Gilbertson	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237898
237899.001	Damian Mata	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237899
237900.001	Adam Gutierrez	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237900
237901.001	Robert Rodriguez	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237901
237902.001	Carlos Arreguin	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237902
237903.001	Alfred Mena	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237892.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237903
237904.001	Matthew Arnett	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237897.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237904
237905.001	William Gilbertson	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237898.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237905
237906.001	Veronica Amado	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237878.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237906
237907.001	Damian Mata	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237899.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237907
237908.001	Adam Gutierrez	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237900.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237908
237909.001	Carlos Arreguin	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237909.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237909
237910.001	Kendra Rieger	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237910
237911.001	Marieantoniette Zapanta	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237877.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237911
237912.001	Andrew Murphy	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237912
237913.001	Richard Reyes	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237880.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237913
237914.001	Jose Monge	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237879.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237914
237915.001	Carlos Portillo	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237881.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237915
237916.001	Fumihiko Itokazu	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237883.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237916
237917.001	Michelle Foster	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237882.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237917
237918.001	Nathan Solano	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237884.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237918
237919.001	Hovhannes Beduryan	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237885.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237919
237920.001	Philip Stewart	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237889.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237920
237921.001	Frank Pavon	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237890.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237921

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237922.001	Tony Duran	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237891.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237922
237923.001	Arturo Gallegos	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237893.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237923
237924.001	Duane Breor	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237924
237925.001	Jared Grosskopf	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237895.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237925
237926.001	Nicole Winans	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237894.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237926
237927.001	William Gilbertson	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237905.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237927
237928.001	Robert Rodriguez	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237901.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237928
237929.001	Richard Hernandez	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237896.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237929
237930.001	Ruben Alvarado	UWUA Local 132 form comment. See comments #237876.001 and .002. Duplicate of 237876.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237930
237931.001	Belinda Ward	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237931
237932.001	Stephen Wilson	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237932
237933.001	Areli Flores	UWUA Local 132 form comment. See comments #237876.001 and .002.	See response to comments #237876.001 and .002, above.	5/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237933
237934.001	Rhonda Plank-Richard	I can't believe there is still any debate on this matter. We guarantee ourselves a grim climate future if we don't transform our energy infrastructure now. New construction is the best and easiest place to start. Why isn't an all-electric code for new construction a done deal? Your decision is of monumental importance. Please think of our future generations when you vote.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/23/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237934
237935.001	Kathy Schaeffer	It is imperative that the CEC move towards all-electric buildings, rather than an incremental electric/gas option in the 2022 code cycle.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237935
237935.002	Kathy Schaeffer	Moving our state to 100% renewable energy would reduce greenhouse gases significantly.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237935
237935.003	Kathy Schaeffer	Moving our state to 100% renewable energy would also be a significant cost savings to consumers. Significant savings could be realized for builders and consumers if gas infrastructure in new construction is not required. Construction costs could be less expensive, and moving forward, utility bills would be significantly lower.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237935
237935.004	Kathy Schaeffer	Reduction of greenhouse gases is an urgent matter. We have suffered severe droughts, wildfires and other extreme weather events which will only worsen if we do not see a significant decrease in the use of fossil fuels.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237935
237935.005	Kathy Schaeffer	State and local municipalities have proposed or mandated strict reductions in greenhouse gas emissions and these efforts should be reinforced with building codes that are consistent with these goals.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237935

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237936.001	Kathy Schaeffer	Duplicate of 237935.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237936
237937.001	Sunrise Movement Orange County	We must have an all-electric building code. Our communities, especially communities of color are being poisoned by fossil fuels. An all-electric building code would create thousands of good-paying clean energy jobs and improve the health of millions of Californians. Do the right thing, ensure that all building codes are all-electric	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237937
237938.001	Haley Brown	We need an all-electric building code. Our communities, especially communities of color and marginalised communities are being poisoned by fossil fuels. We must decarbonize because our climate is in crisis. An all-electric building code would create thousands of good-paying clean energy jobs and improve the health of millions of Californians. Do the right thing, ensure that all building codes are all-electric.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237938
237939.001	Alex Berk	We must have an all-electric building code to reduce our greenhouse gasses. The building industry is extremely slow to innovate. California's most marginalized communities can't wait that long-- policy is vital to make sure these urgent needs are met. Just like seismic codes prevent earthquake damages, electrification codes will prevent public health crises.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237939
237940.001	Victoria Friesen	Hello. I am writing to ask you to create an all-electric building code. Our state, especially in communities of color and other marginalized communities, are being poisoned by fossil fuels. We must decarbonize as fast as possible to address the climate crisis. An all-electric building code would create thousands of good-paying clean energy jobs and improve the health of millions of Californians. Let's leave fossil fuels in the past. Please consider an all-electric building code.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237940
237942.001	Michelle Lewis	See 237937, 237938 and 237940.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237942
237943.001	Bruce Hodge	The CEC should require all-electric buildings in the 2022 code cycle. Numerous analyses, studies and papers show that we can no longer afford to bring new fossil-fueled infrastructure online and stay below the 1.5° threshold, which increasingly is not looking like much of a safe horizon.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237943
237943.002	Bruce Hodge	Less than a week ago, the International Energy Administration issued a report that explains that new development of fossil fuel has to cease now for the world to have any chance of the meeting the Paris accord targets.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=237943

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237943.003	Bruce Hodge	There are no cogent arguments that support the idea of building new fossil infrastructure. Building all-electric is cheaper and the operational costs are comparable if not cheaper. Allowing new fossil-fossil fueled infrastructure will leave a lot of stranded assets, which is an economic burden that we can easily avoid.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237943
237943.004	Bruce Hodge	Requiring all-electric buildings in the 2022 code is a no-brainer. We can no longer afford to delay on this important decision.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237943
237945.001	Kar Selm	The CEC should move towards all-electric buildings in the 2022 code cycle. Partial electrification does not go far enough in addressing the climate crisis we find ourselves in. Please require all-electric buildings for new construction in the 2022 code cycle.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237945
237945.002	Kar Selm	It also puts us out of step with the state and the nation. The Biden campaign has pledged to cut building sector emissions in half by 2035 and to eliminate all power sector emissions by the same year. Fellow state level agencies like the California Air Resources Board and Bay Area Air Quality Management District have submitted letters and made oral statements that the CEC should move to all-electric buildings in 2022.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237945
237945.003	Kar Selm	Your own building decarbonization assessment says newly constructed buildings have the lowest decarbonization costs" and that accelerating efficient electrification of building end uses in both new and existing buildings represents the most predictable pathway to achieve deep reductions in building emissions. Perhaps the most important point to me, as I live in Thousand Oaks which is currently working on a land use map update that incorporated several RHNA cycles worth of housing allocations, is a point also made in your decarb assessment. Building decarbonization efforts should work in harmony with the state's response to the housing crisis. It makes no sense to invest in costly gas infrastructure that will soon be out of step with the way the world is going. I do not want to see new construction locking into a costly and outdated form of energy.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237945
237945.004	Kar Selm	Perhaps the most important point to me, as I live in Thousand Oaks which is currently working on a land use map update that incorporated several RHNA cycles worth of housing allocations, is a point also made in your decarb assessment. Building decarbonization efforts should work in harmony with the state's response to the housing crisis. It makes no sense to invest in costly gas infrastructure that will soon be out of step with the way the world is going. I do not want to see new construction locking into a costly and outdated form of energy.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237945
237946.001	Clint Furtz	See 237943.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237946

Comment Numbers	Commenter and/or Copy of Comment Language (mainly for Legal Office Use, will be removed from final submission)	Comment	The Commission's Response to the Comment	Date of Comment	Phase	Title or Other Description of Comment (link to docketed comment if possible)
237947.001	Rose Ann Witt	A comprehensive May 2020 report authored by the International Energy Agency, a traditionally conservative, fossil fuel-focused, global energy policy body, warns that the world MUST STOP new fossil fuel investment THIS YEAR to limit global temperature rise to the critical, not-to-be-exceeded 1.5 degrees Celsius limit. IEA further explained that doing so result in tremendous benefits by creating 30 million new jobs, preventing 2.5 million deaths every year, and ADDING 0.4% to annual, global GDP growth.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237947
237947.002	Rose Ann Witt	CEC's 2022 draft building code FAILS to protect California's climate, health and economy by INCREASING fossil gas infrastructure investment. By allowing the continued incorporation of obsolete fossil fuel infrastructure, just as California is mandating significantly increased housing construction statewide, CEC ensures millions more homes will be saddled with stranded assets and costly retrofits.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237947
237947.003	Rose Ann Witt	Californians already face escalating extreme heat; we can expect a long list of costly crises including another mega-drought, shrinking water supplies, intensifying wildfire risk, worsening air quality, more respiratory illness, health and crop damaging pests, reduced chill hours for fruit and nut trees, lower farm and livestock yields, diminished wine-grape quality, and increasing demands on an already strained grid.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237947
237947.004	Rose Ann Witt	Fossil gas-powered buildings alone contributed over a QUARTER of California's Global Heating emissions in 2016; and, as the IEA has announced, there's NO reasonable path to meeting our climate goals while continuing to burn gas in our buildings because pound for pound, the methane composing fossil gas is 84 times MORE POTENT as a greenhouse gas than carbon. California MUST rapidly phase out this toxic power source in favor of 100% clean, renewable energy.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237947
237947.005	Rose Ann Witt	CEC must heed the advice of the C.A.R.B and the Bay Area A.Q.M.D. NOW and shift its rhetorical climate leadership into real action by REPLACING fossil gas connections with ALL ELECTRIC connection requirements in the 2022 building code cycle.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237947
237947.006	Rose Ann Witt	Given your positions at the CEC, you must know that the most significant, unspoken environmental justice issue in our state is hiding in plain sight. Turning on our kitchen ranges, furnaces, water heaters and dryers, and burning fossil gas creates dangerous levels of health-destroying pollutants (including nitrogen dioxide, formaldehyde, carbon monoxide and particulate matter) INSIDE California homes that would be illegal OUTDOORS. Children of families with gas stoves are 42% more likely to experience asthma symptoms; and like the injustices of most forms of pollution, the most vulnerable kids, especially minority children residing in smaller, crowded living spaces without effective range hoods have the most exposure, with the most debilitating health impacts.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle. CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions. This long-term transition towards heat pump technologies directly addresses and should resolve these concerns, but will require time. Staff appreciates the commenter's participation and encourages further participation in the 2025 code cycle.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237947

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237947.007	Rose Ann Witt	The single-most effective strategy CEC can take to slash climate-destabilizing emissions, protect our children's health, reduce construction and utility costs (to actually enable the otherwise elusive affordable housing our state so desperately needs), increase building safety, and preserve our state's economic vitality is to require all new construction be built ALL-ELECTRIC NOW and STOP installing fossil gas in any new buildings.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237947
237948.001	Mark Roest	Have you considered building-integrated thin film PV? One non-framed, flexible (conformable) PV was announced this week. And we will be introducing a thin film printed directly on a building's sheathing materials, which converts efficiently at wide angles and from reflected and scattered light, making it ideal for building walls as well as roofs, which opens a path for high-rise buildings to be fully-solar-powered. A 23%-efficiency solar thin film was recently announced, and we intend to produce thin film that is close to or equal to 48% efficient. That will initiate a revolution in solar production on buildings. The companion to the rooftop is solar canopies over parking, driveways, and wherever shade and / or rain/snow protection is desired.	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237948
237948.002	Mark Roest	We also ask you to stretch to include building-integrated solar (and stationary battery storage) as required where needed to meet typical demand of both building and all associated vehicles under most conditions. We expect you would specify that it be cost-effective (as you appear to may already be doing with widely-used technologies today). But could you please specify that as new technologies (such as our and other companies) reach the market with higher performance-to-price ratios, they must be considered (as 'best available technology') when there is a shortfall under usual conditions, compared to the total required for both the building and the vehicles associated with it?	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237948
237948.003	Mark Roest	Our technologies are designed for high-volume manufacturing using existing, mature fabricating technologies. We are planning volume production of the battery in 2H2022, and the solar thin film by 2023. We want to be a strongly considered option when the code takes effect; it would be harmful to wait to 2025 or 2026 before our level of performance is recognized or included in best available technology language. We look for the market to be pushed to the 'best available technology' starting with this revision of the regulations.	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237948
237949.001	Stephanie Morris (Mothers Out Front)	You have today one powerful change you can make to help us avoid the worst impacts of the climate crisis. I urge you to adopt an ALL-ELECTRIC requirement for all building types in the 2022 building code. Please act with the urgency this moment requires, setting the standard for California and motivating other states to take action. The 2022 building code MUST require all-electric buildings.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949

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237949.002	Stephanie Morris (Mothers Out Front)	I know we cannot wait until the 2025 code update to phase out gas because this would lock us into 8 more years of NEW gas appliances and infrastructure, until 2029, due to the lag in completing construction after permitting for large projects. The result? Millions of dollars in additional infrastructure costs and up to 3 million tons of additional emissions by 2030. This is incompatible with the science and with the climate reality we are now experiencing.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.003	Stephanie Morris (Mothers Out Front)	Multiple studies confirm building all-electric is less expensive than building with gas in both residential and commercial construction.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.004	Stephanie Morris (Mothers Out Front)	In California 95 percent of homes still use gas heating. We lag behind the rest of the country in converting to more efficient heat pump technology.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.005	Stephanie Morris (Mothers Out Front)	We still allow new gas stoves to be installed, knowing they contribute to toxic indoor air quality.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.006	Stephanie Morris (Mothers Out Front)	Fossil gas extraction and transport continues, releasing tons of methane, a super potent greenhouse gas which heats the planet up way faster than carbon dioxide.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.007	Stephanie Morris (Mothers Out Front)	We need building codes to set the standards, so that market conditions reflect our climate reality. According to RMI reports, cost-effective electrification is possible for residential new buildings even in the coldest climates. Contractors and technology will continue to adjust based on code requirements, and it is this process that will allow us to phase out gas infrastructure.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.008	Stephanie Morris (Mothers Out Front)	We won't achieve the climate gains of electrification until we phase out the gas infrastructure. Establish an all electric code, with temporary exceptions only as needed for any current gaps in technology. This is an emergency and we cannot take an incremental approach anymore.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.009	Stephanie Morris (Mothers Out Front)	State Level agencies like the California Air Resources Board and Bay Area Air Quality Management District have submitted letters and made oral statements that the CEC should move to all-electric buildings in 2022.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949

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237949.010	Stephanie Morris (Mothers Out Front)	The code as written now will result in a dire future for millions of children. Mothers Out Front is asking the CEC to step up now at this critical time. It is your responsibility to protect public health and climate stability. It makes no sense to continue to build new buildings with outdated and unhealthy gas infrastructure.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237949.011	Stephanie Morris (Mothers Out Front)	This past year, I've spent hours of volunteer time with my team working with multiple cities in Silicon Valley one by one to pass electric reach codes. Let's stop asking city councils and citizens to become experts on the intricacies of building electrification, creating an ineffective patchwork of partial building electrification.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237949
237950.001	Helena Birecki	In light of California's goals to be a net zero state by 2045 we cannot afford to add gas to new buildings. In light of the climate emergency, it is imperative that the CEC be allowed to consider the life-cycle Greenhouse gas emissions and costs its decisions create "not just within the building" but also upstream and downstream (gas well and pipeline leaks, stranded assets). In light of Governor Newsom's acknowledgment of the Climate Emergency, now is the time for you, Commissioners, to ask for the Governor to fix these shortcomings in your authority. Ask to be granted, because of the urgency of the climate emergency, the authority to consider the full emissions and costs of your decisions and do what's needed. We need a single all-electric baseline in the 2022 building code.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237950
237964.001	Mary Freed	We have a housing crisis in California. Here in Thousand Oaks the State of Ca. is requiring the City to make zoning changes to allow for new housing units. New housing in the state of Ca. should be required to be all electric. No more gas hookups.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237964
237966.001	Gordon Clint	We must stop adding to our climate crisis with new fossil gas infrastructure. A first step that the CEC can take is to require all-electric buildings for new construction in the 2022 code cycle. Please take that step.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237966
237970.001	Faith Grant	I support all-electric buildings in the 2022 code cycle. Agencies like CARB and BARQMD have submitted letters that the CEC move to all-electric buildings in 2022. CARB adopted a resolution limiting emissions from gas appliances in buildings. The resolution commits CARB to support the CEC to adopt standards in the 2022 code cycle that will result in electrification of appliances for all new buildings. Biden has pledged to cut building emissions 50% by 2035. The IEA released a report that there should be no new fossil fuel home heaters sold after 2025. Gas home heating is a major source of carbon emissions in many countries, responsible for around 20% of CO2 in the US and the UK. CEC put this code into effect!	CEC staff has determined that the adopted standards are the best approach to achieve the State's and Federal Government's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237970
237971.001	Robert Gould	We support rapid electrification of our infrastructure provided by renewable and sustainable, non-nuclear sources, as replacement for natural gas, in support of climate, respiratory and cardiovascular health.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237971

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237971.002	Robert Gould	We urge that the CEC should immediately move towards all-electric buildings in the 2022 code cycle, a recommendation consistent with positions of the California Air Resources Board and Bay Area Air Quality Management District.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237971
237971.003	Robert Gould	We also know that African-American and Hispanic children with asthma are disproportionately burdened by indoor air pollution from gas stoves, as they are more likely living in housing with smaller unit size and greater occupant density, and often inadequate stovetop ventilation that contribute to elevated concentrations of NO2 in lower-income, multifamily buildings. And of course, we need to consider the disproportionate impacts of outdoor air pollution suffered by these same multiburdened communities.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237971
237971.004	Robert Gould	A 2013 meta-analysis found that children in homes with gas stoves have a 42% increased risk of experiencing asthma symptoms (current asthma), a 24% increased risk of ever being diagnosed with asthma by a doctor (lifetime asthma), and an overall 32% increased risk of both current and lifetime asthma. Reinforcing this, a 2018 study published in the Medical Journal of Australia indicated that for 12.3% of asthma sufferers aged 14 or younger in Australia, the condition was triggered or worsened by exposure to gas stoves.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237971
237971.005	Robert Gould	All-electric buildings are cheaper to build and operate, are better for public health, and a critical pathway to protect us from our climate crisis.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237971
237978.001	Dan Johnson	Do the ventilation requirements in 120.X and 150.0(o) supersede the California Mechanical Code completely, or shall designers calculate the airflow rate for each code, then use the airflow rate that is the greater of the two codes (the most stringent)?	This comment are outside the scope of this rulemaking. The appropriate docket is 21-BSTD-03, and can be found here: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239562&DocumentContentId=72995 . Please see the Building Standards Commission for questions regarding the California Mechanical Code.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237978
237978.002	Dan Johnson	CMC 402.1 Occupiable Spaces: Is this just a courtesy note informing the designer that more than one code applies, or does this note mean that CEnC supersedes CMC for ventilation air requirements, even when the CMC is more stringent?	This comment are outside the scope of this rulemaking. The appropriate docket is 21-BSTD-03, and can be found here: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239562&DocumentContentId=72995 . Please see the Building Standards Commission for questions regarding the California Mechanical Code.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237978
237978.002	Dan Johnson, CEA	Please clarify: Is this just a courtesy note informing the designer that more than one code applies, or does this note mean that CEnC supersedes CMC for ventilation air requirements, even when the CMC is more stringent?	This comment are outside the scope of this rulemaking. The appropriate docket is 21-BSTD-03, and can be found here: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239562&DocumentContentId=72995 . Please see the Building Standards Commission for questions regarding the California Mechanical Code.	5/25/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237978&DocumentContentId=71221

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237978.003	Dan Johnson	Does "authority" mean CEnC airflow rates always govern, even when CMC is more stringent?	This comment are outside the scope of this rulemaking. The appropriate docket is 21-BSTD-03, and can be found here: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239562&DocumentContentId=72995 . Please see the Building Standards Commission for questions regarding the California Mechanical Code.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237978
237978.003	Dan Johnson, CEA	CEnC interprets this CMC 402.1 note in the commentary document 2019 Nonresidential Compliance Manual, page 4-67: Title 24, Part 4, states; "Ventilation air supply requirements for occupancies regulated by the California Energy Commission are found in the California Energy Code." Thus, it refers to Title 24, Part 6 as the authority on ventilation. Does "authority" mean CEnC airflow rates always govern, even when CMC is more stringent? See this screenshot from Form NRCC-MCH-E below, which references UMC. (Please correct: UMC is a model code that is not adopted in CA; the amended CMC is adopted) This says "the most stringent code requirement takes precedence":	The Energy Code ventilation requirements take precedent for spaces identified in the Energy Code, even if the space is also identified in the Mechanical Code. This was clarified in proposed language to the Mechanical Code. This comment will be considered as NRCC-MCH-E are updated for 2022.	5/25/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=237978&DocumentContentId=71221
237978.004	Dan Johnson	If CMC governs all occupancy ventilation rates whenever CMC is more stringent, then why is only Healthcare noted repeatedly in CEnC? 2019 NonRes Compliance Manual section 4.3 regarding 120.1 says "Ventilation requirements for healthcare facilities should conform to the requirements in Chapter 4" of the CMC, implying that other occupancies are NOT regulated by the CMC?	This comment are outside the scope of this rulemaking. The appropriate docket is 21-BSTD-03, and can be found here: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239562&DocumentContentId=72995 .	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237978
237978.005	Dan Johnson, CEA	If the more stringent code governs, then Residential Dwelling Unit occupancies will all be governed by CMC, which requires 5 CFM/person + 0.06CFM/SF. For example, a 1200 SF, 2- bedroom home, CFM = 87 CFM. A designer will also compute the air using CEnC (ASHRAE 62.2) at 7.5 CFM/person + 0.03CFM/SF = 59 CFM, and find that CMC governs. CMC makes the lower airflow rates in ASHRAE 62.2 irrelevant. Compliance software CBECC-COM and -RES use ASHRAE 62.2 airflow calculations for homes. A designer who inputs the more stringent CMC airflow design rates will take a penalty in CBECC for over-ventilating. The CEC recently discussed revisions to the Res ACM such that a ventilation rate exceeding 110% of ASHRAE 62.2 takes an explicit penalty. In the example above, the CMC airflow exceeds by 47%. Therefore the compliance software implies that the more stringent code DOES NOT govern, that all occupancies regulated by CEnC must be designed to CEnC airflow rates or be penalized by the Performance Calculation. Please clarify the policy rules for engineers statewide, and please align the compliance software with Compliance Manuals, NRCC-MCH-E footnotes, and italic notes in CMC 402.1 as necessary.	Staff has proposed more specific language for the California Mechanical Code to clarify that the Energy Code takes precedent in spaces listed in the Energy Code. This will better align with what is represented in compliance software.	5/25/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=237978&DocumentContentId=71221

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237978.006	Dan Johnson	Compliance software CBECC-COM and -RES use ASHRAE 62.2 airflow calculations for homes. A designer who inputs the more stringent CMC airflow design rates will take a penalty in CBECC for over-ventilating. The CEC recently discussed revisions to the Res ACM such that a ventilation rate exceeding 110% of ASHRAE 62.2 takes an explicit penalty. Therefore the compliance software implies that the more stringent code DOES NOT govern, that all occupancies regulated by CEnC must be designed to CEnC airflow rates or be penalized by the Performance Calculation.	Staff has proposed language for the California Mechanical Code to clarify this language. The Energy Code is to take precedent over the Mechanical Code for spaces identified in the Energy Code. The Energy Commission will be providing guidance documents and other support, such as software, at a later time.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237978
237978.007	Dan Johnson	Please clarify the policy rules for engineers statewide, and please align the compliance software with Compliance Manuals, NRCC-MCH-E footnotes, and italic notes in CMC 402.1 as necessary.	Staff has proposed language for the California Mechanical Code to clarify this language. The Energy Code is to take precedent over the Mechanical Code for spaces identified in the Energy Code. The Energy Commission will be providing guidance documents and other support, such as software, at a later time.	5/24/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237978
237979.001	Stephanie Tong	We must have an all-electric building code. Globally, we are in a climate crisis, action needs to be taken now. Empathetically, you have the power to stop poisoning people in their own homes. Progressively, fossil fuels are a barbaric technology and we need to move forward with current technology. Economically, an all-electric building code would create thousands of good-paying clean energy jobs and make Californians healthier and more productive. Do the right thing, ensure that all building codes are all-electric.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	5/25/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=237979
238054.001	Jon McHugh	The added exception 4 to Section 130.2(c) and exception 4 to Section 160.5(c)2C, have not been carefully vetted through several stakeholder meetings and pre-rulemaking workshops, with multiple public opportunities to comment and suggest revisions.	Staff have received comments with different takes about the added/proposed Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C - about outdoor motion sensing controls. Since no data is available about the subject other than dated studies and reports, staff recommends not to include Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C in the 15-day language for 2022. This subject would be advisable to be visited in the 2025 Code Development.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054
238054.002	Jon McHugh	Neither the ISOR, nor the information presented at the May 24th Staff Presentation, included detailed informaton on the cost of the motion controls or their life cycle savings.	There are considerations beyond the costs and savings for the proposed Exception 4 about outdoor motion sensing controls. Staff have also received comments with different takes about the added/proposed Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C - about outdoor motion sensing controls. Since no data is available about the subject other than dated studies and reports, staff recommends not to include Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C in the 15-day language for 2022. This subject would be advisable to be visited in the 2025 Code Development.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054

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238054.003	Jon McHugh	The CASE team evaluated whether Exception 3 to Section 130.2(c)3 could be simplified by collapsing the threshold to a single greater than 30 watt threshold wattage and found that for all outdoor parking lot applications, motion controls were cost effective for all parking lot luminaires with a wattage rating greater than 30 watts. Commission staff reviewed the proposal and adjusted the threshold upwards to 40 watts. There is a significant amount of information in the public record that indicates that the current 40-watt threshold is cost-effective and could even be lowered slightly to benefit from additional statewide energy savings. The statewide energy savings associated with decreasing the wattage of exempted lighting from those luminaires less than 75 watts to luminaires less than 30 watts was 12 GWH/yr for each year's new construction and retrofits. In reversing the 40-watt threshold requirement, and increasing even further to 78 watts, I am expecting that around 12 GWH/yr increased energy consumption would result.	The comment refers to a previous CASE proposal (2016) change which is outside the proposed change in this code change rulemaking. Also staff disagrees with the comment for suggestion to consider dated proposal and information. As there are no up-to-date cost and associated savings that are yet available and considering more data is needed to support the proposed change, staff recommends not to adopt any changes in this code cycle for the motion sensing controls - not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054
238054.004	Jon McHugh	There are benefits to aligning with national model codes (such as ANSI/ASHRAE/IES 90.1-2019 and the 2021 version of IECC) when it brings additional energy savings and simplifies code requirements across state borders. However, in this case, where energy consumption would increase, I am not aware of any mandate in the Warren-Alquist Act or other state regulation that asks the Energy Commission to decrease stringency of California building codes to align with other codes.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054
238054.005	Jon McHugh	California's electricity rates are up to two times higher than the average US electricity rates that the ASHRAE 90.1 committee uses for evaluating the cost-effectiveness of code change proposals. What might be cost-effective in California might not be cost-effective for the ASHRAE model code.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054
238054.006	Jon McHugh	Additionally, it is worth noting that California's bi-level motion-controlled lighting requirements preceded those in ASHRAE 90.1 and the ASHRAE 90.1 committee did not feel a similar compunction to align with California's standard	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054
238054.007	Jon McHugh	HID use in outdoor lighting has been effectively phased out by LEDs and advancing energy codes. Adjusting California's Energy Code to align with a requirement that was adjusted to include a legacy technology in a transitional time in the lighting industry does not seem well justified. Outdoor lighting is contributing to California's increase in demand for non-renewable generation occurring after sunset. California's energy costs and economic evaluation criteria diverges widely from ASHRAE's.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054
238054.008	Jon McHugh	I recommend deleting the following when the 15-day Express terms for 2022 Energy Code are published: The newly added Exception 4 to Section 130.2(c)3, and Exception 4 to Section 160.5(c)2C.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238054

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238060.001	California Lighting Technology Center	The newly proposed exception to Section 130.2(c)3 for parking lot lighting that eliminates occupancy-based controls requirements should be removed.	There are comments with different takes about the added Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C. It is evidential that more data is needed for the subject other than outdated studies and reports, Staff recommends not to include Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C in the 15-day language for 2022. This subject may be advisable to be revisited in the 2025 Code Development. (Same subject as in line item # 63, 71, 118, 149 and 162)		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060
238060.002	California Lighting Technology Center	The proposed increased wattage allowance on parking lot, single-pole lighting of 78 watts each [or less] is a step backwards. California needs to be moving in the opposite direction towards occupancy-based control requirements for reduced wattage luminaires and luminaires mounted at 24' or more. This exception would essentially eliminate the use of sensors for all new and retrofitted parking lots in California.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060
238060.003	California Lighting Technology Center	The proposed threshold increase will result in a significant increase in nighttime energy use and light pollution with related circadian disruption.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060
238060.004	California Lighting Technology Center	Today most single-pole (less than 24 feet) parking lot luminaires use wattages of 80W or less, which makes 78W threshold completely unrealistic in terms of generating energy savings.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060
238060.005	California Lighting Technology Center	Nearly 10 years ago, 30 W was demonstrated to be cost-effective and documented as such in the docketed IOU CASE report prepared to support the 2013 Energy Standards update. At that time, sensors and controls were much more expensive. Today, even with reduced outdoor power allowances, the cost of controls is so inexpensive that the costeffectiveness of the occupancy control measure remains valid. Additionally, work completed by the CEC in collaboration with CLTC for the 2019 Energy Standards code cycle, demonstrated that this threshold remained valid.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060
238060.006	California Lighting Technology Center	For the 2019 Energy Standards update, the CEC reduced the wattage exception to 40W. Now the Energy Commission is reversing this good work and sacrificing energy savings, community's night skies, citizen health and public safety. There's no reason that any typical wattage parking luminaire should be left on at 100 percent in an empty parking lot. Relying on scheduling controls only that may or may not be activated/maintained would resent serious safety and liability issues.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060
238060.007	California Lighting Technology Center	At a minimum, the existing 40 watt exception for Section 130.2(c)3 should be maintained.	There are no proposed changes to the 40 watt exception for Section 130.2(c)3. Thank you for providing comments to CEC for this rulemaking effort.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060

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238060.008	California Lighting Technology Center	At best, California needs to lead efforts to further reduce the threshold to 30 watts or even remove the exception all together. Occupancy-based controls, and fixture-integrated occupancy controls in particular, are widely available, inexpensive, and will deliver increased savings to the state of California, while also reducing light pollution and circadian disruption.	Thank you for providing comments to CEC for this rulemaking effort. The 2022 rulemaking do not have the 40 watt exception in the rulemaking scope. This subject could be considered in future code update.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238060
238087.001	Codes and Standards Enhancement (CASE) Team	The Statewide CASE Team recommends these new exceptions (EXCEPTION 4 to Section 130.2(c)3 and EXCEPTION 4 to Section 160.5(c)2C) be removed because it represents a decrease in stringency and will increase electricity consumption. This exception would increase statewide electricity use by approximately 12 GWh in 2023, the first year the 2022 code is in effect. Electricity use would increase an additional approximately 12 GWh and increase carbon emissions by approximately 2,880 Tons of CO2e per year, per year for every subsequent year.	There are comments with different takes about the added Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C. Since no data is available about the subject other than dated studies and reports, Staff recommends not to include Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C in the 15-day language for 2022. This subject may be advisable to be revisited in the 2025 Code Development. (Same subject as in line item # 63, 71, 118, 149 and 162)		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238087
238087.002	Codes and Standards Enhancement (CASE) Team	The "2019 CASE Report: Nonresidential Outdoor Lighting Controls – Final Report" documented that motion controls for parking lot lighting for were cost effective with a 30-watt threshold for all outdoor applications evaluated.3 Increasing the wattage threshold to 78 watts lacks costeffectiveness justification and represents a roll-back of the stringency of Title 24, Part 6.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238087
238087.003	Codes and Standards Enhancement (CASE) Team	No new publicly available evidence has been provided to demonstrate the assertion in the Initial Statement of Reasons that the current requirements are not cost effective. (pdf pages 5-6 discuss CASE Report cost effectiveness)	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238087
238087.004	Codes and Standards Enhancement (CASE) Team	Scheduling controls are also required for outdoor lighting, but they may not provide the energy savings offered by occupancy-based controls	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238087
238087.005	Codes and Standards Enhancement (CASE) Team	The average night-time (sunset to sunrise) duration is around 12 hours, with parking lots being occupied a relatively short fraction of this time. For most of these hours, occupancy sensors can turn off or dim the lights. This reduces sky glow, visual trespass, and associated impact on the natural environment and circadian disruption.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238087
238087.006	Codes and Standards Enhancement (CASE) Team	Recommended language changes pdf page 8.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238087

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238138.001	Linda Hutchins-Knowles (Mothers Out Front)	I'm disappointed that the proposed code does not match the urgency necessary to stabilize the climate nor protect people's health from the degraded air quality caused by the use of gas appliances, especially stoves.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138
238138.002	Linda Hutchins-Knowles (Mothers Out Front)	I urge you to . . . adopt an all-electric code for new construction beginning in the 2022 code cycle.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138
238138.003	Linda Hutchins-Knowles (Mothers Out Front)	An incremental approach is completely inadequate to address the public health and climate crises. We need you to act swiftly to protect our health, safety, and climate and promote equity by ensuring that new buildings do not perpetuate the use of fossil gas infrastructure. "Winning slowly is the same as losing." Don't fail our children by punting this necessary change to future code cycles. Take action now to initiate a just transition to all-electric new buildings so our children can have a healthy environment today and a livable climate tomorrow.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138
238138.004	Linda Hutchins-Knowles (Mothers Out Front)	The use of gas appliances, particularly gas stoves, degrades indoor air quality and harms health. Children living in homes with gas stoves are 42% more likely to experience symptoms of asthma.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138
238138.005	Linda Hutchins-Knowles (Mothers Out Front)	Gas is a leading cause of structure fires, burns, and carbon monoxide poisoning, causing half of all fires post earthquakes.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138
238138.006	Linda Hutchins-Knowles (Mothers Out Front)	Fracked gas releases methane at every step of the production cycle, making "natural" gas more destabilizing to the climate than coal.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138
238138.007	Linda Hutchins-Knowles (Mothers Out Front)	Communities of color and low-income communities are disproportionately harmed by the extraction and storage of gas as well as the combustion of gas in the home, leading to inequitable health outcomes and increased mortality from COVID-19.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle. Addressing natural gas extraction in local communities is beyond the scope of this rulemaking.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138
238138.008	Linda Hutchins-Knowles (Mothers Out Front)	There is no justification for continuing to build with dangerous and destabilizing gas when affordable and highly efficient electric appliances are readily available, including induction cooktops and heat pumps. The market is ready, it just needs a clear signal from the CEC.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238138

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238139.001	Pierre Delforge et al. (NRDC et al.)	Using methane (a.k.a. natural gas) to provide heat and hot water in (newly constructed residential) buildings would lock their residents into rapidly increasing energy bills and harmful indoor air pollution for decades, would cost Californians \$1 billion in unnecessary gas infrastructure, and cause 3 million tons additional carbon emissions by 2030.	Staff appreciates the comment	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.002	Pierre Delforge et al. (NRDC et al.)	As concluded in a recent United Nations report, "expansion of natural gas infrastructure and usage is incompatible with keeping warming to 1.5° C." It is therefore critical the 2022 Building Code be as effective as possible in reducing California's dependency on fossil fuels.	Staff appreciates the comment	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.003	Pierre Delforge et al. (NRDC et al.)	Because California is a national and global leader in building efficiency standards and with new construction globally expected to add the equivalent of one New York City's worth of new buildings every month for the next 40 years, a strong building code will help influence other jurisdictions looking to California's leadership in setting advanced building energy standards.	Staff appreciates the comment	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.004	Pierre Delforge et al. (NRDC et al.)	We appreciate the CEC's continued efforts to shift the market toward clean and efficient all-electric new construction through code changes such as strengthened electric-ready requirements and the inclusion of heat pump space or water heating in standard designs for most building types. These efforts are critical to accelerating building decarbonization and helping achieve a clean-air and carbon-neutral economy in California.	Staff appreciates the comment of support.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.005	Pierre Delforge et al. (NRDC et al.)	Make heat pump water heaters (HPWH) the baseline for single family in climate zone 10, as proposed by staff at the 5/24/2021 workshop. (CZ10) is one of the highest new home construction climate zones in the state with nearly 15 percent of all new single-family housing units expected in 2023. Express Terms currently set electric HVAC (heating ventilation and air conditioning) as the baseline. this would fail to provide a strong incentive for electric heating because a gas furnace could easily comply. This could set up this high-construction area for three more years of gas-fueled buildings and gas infrastructure.	Staff agrees with the comment and the adopted language reflected this change	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.006	Pierre Delforge et al. (NRDC et al.)	Provide a prescriptive compliance pathway for all-electric heat pumps in non-residential and multifamily in climate zones 1 and 16, as is currently allowed under the 2019 code. Express Terms set the prescriptive space heating baseline to a dual-fuel heat pump, which has the effect of prohibiting electric heat pumps for buildings that comply using the prescriptive path in these climate zones. This would be a step backwards from today's code, which allows for any minimum efficiency heat pump to comply prescriptively, including ductless, ducted, water-source, and packaged terminal heat pumps. All of these options would be eliminated under the prescriptive path as proposed and would require gas infrastructure for buildings in these climate zones when complying prescriptively.	As part of the 2022 analysis for the HP baseline, it was determined that dual fuel HP or HP uses more TDV energy than AC plus furnace for climate zones 1 and 16,. Therefore It will not be appropriate to set HPSH as the prescriptive standard for CZ1 and 16. Higher performing HP can be used in the performance compliance method to comply.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139

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238139.007	Pierre Delforge et al. (NRDC et al.)	While we understand that a minimum efficiency split heat pump has a higher Time Dependent Valuation score in climate zones 1 and 16 than a dual fuel heat pump and therefore cannot be used to set the performance baseline, we urge the commission to continue to allow all heat pump options prescriptively, as in the current code.	See responses to item 6 (238139.006)	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.008	Pierre Delforge et al. (NRDC et al.)	The prescriptive path is used extensively in multifamily and non-residential buildings. Excluding heat pumps from the prescriptive path would slow the adoption of heat pumps in those buildings and lead to continued gas infrastructure development, in spite of the availability of alternatives, such as cold climate heat pumps, that perform well in these climate zones	See responses to item 6 (238139.006)	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.009	Pierre Delforge et al. (NRDC et al.)	We urge the CEC to include an alternative compliance option in the prescriptive path that would allow for heat pumps to comply in all climate zones. Not doing so would create obstacles to electrification for non-residential and multi-family construction in climate zones 1 and 16.	See responses to item 6 (238139.006)	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.010	Pierre Delforge et al. (NRDC et al.)	To ensure good heat pump performance in these colder climates, we recommend that this compliance option include minimum specifications for cold climate performance for equipment installed in climate zones 1 and 16. For residential equipment used in multifamily buildings, we recommend the alternative compliance option requirements in these climate zones align with the Northeast Energy Efficiency Partnership's cold climate specification that requires a coefficient of performance (COP) greater than 1.75 at 5°F (at maximum capacity), use a variable speed compressor, and have a heating seasonal performance factor (HSPF) greater than 9.	We are developing the modeling capability for cold climate heat pump and it was not ready for evaluating prescriptive options for this rulemaking. We will consider this option for the 2025 cycle	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.011	Pierre Delforge et al. (NRDC et al.)	To ensure good heat pump performance in these colder climates, we recommend that this compliance option include minimum specifications for cold climate performance for equipment installed in climate zones 1 and 16. For commercial equipment, we recommend that the CEC set minimum COP and capacity requirements at 17°F, which are typically reported by manufacturers, and a variable speed compressor.	See response to item 10 (TN238139)	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.012	Pierre Delforge et al. (NRDC et al.)	Expand the compliance incentive to system types most commonly used in large buildings. Expanding incentives to all system types is needed to shift all new construction to clean electric, so there is no need to build new gas infrastructure that will become stranded before the end of its life. As a first step, we recommend that the CEC expand the electric baseline systems to all packaged units, such as rooftop units, including those that serve multizone systems.	This is outside the scope of this rulemaking. The Energy Commission will continue to develop modeling capability for additional compliance options in the compliance software	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139

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238139.013	Pierre Delforge et al. (NRDC et al.)	Express Terms propose robust compliance incentives (notwithstanding climate zone 10, 1, and 16 as discussed above) for individual HVAC and water heating systems used in single-family homes, as well as for single-zone heat pumps commonly used in multifamily units and smaller non-residential buildings like small offices and schools. However, large non-residential buildings often use multi-zone, packaged, or central HVAC and HPWH systems, and there is currently no compliance incentive for the electric heat pump versions of these systems in the Express Terms	This is outside the scope of this rulemaking. The Energy Commission will continue to develop modeling capability for additional compliance options in the compliance software	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.014	Pierre Delforge et al. (NRDC et al.)	The following key advance in the draft Express Terms that must remain in adoption of the final code: The incentive-based approach that encourages efficient electric space and water heating through compliance incentives.	Staff appreciates the comment of support.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.015	Pierre Delforge et al. (NRDC et al.)	The following key advance in the draft Express Terms that must remain in adoption of the final code: The strengthened and expanded electric-ready requirements for water heating, space heating, cooking, and drying will ensure that new homes fueled by gas will be able to affordably upgrade to electric appliances in the future.	Staff appreciates the comment of support.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.017	Pierre Delforge et al. (NRDC et al.)	The following key advance in the draft Express Terms that must remain in adoption of the final code: The new standalone multifamily chapter. The new multifamily chapter will clarify and streamline requirements for multifamily projects which are a critical housing type to reduce housing costs, and allow people to live closer to their workplaces, reducing sprawl and transportation energy use and emissions.	Staff appreciates supportive comment.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.018	Pierre Delforge et al. (NRDC et al.)	The following key advance in the draft Express Terms that must remain in adoption of the final code: The updated fan efficiency requirements which will require both a mandatory minimum fan energy index and prescriptive fan power limits lead to significant energy savings in one of the major energy-using systems in nonresidential buildings.	Staff appreciates supportive comment.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238139.019	Pierre Delforge et al. (NRDC et al.)	The CEC should continue to enhance the compliance software to be able to model HVAC systems not currently supported, including systems commonly used in large buildings, and advanced heat pumps used in all types of buildings. The California code compliance software (CBECC) cannot currently model, or does not appropriately model, system types that are less common but nonetheless essential to cost-effective building decarbonization. These include multi-pass central HPWH, air-to-water heat pumps for space heating, heat recovery chillers, and thermal storage. The commission has made great progress on these issues over the past few years, continued and rapid progress is essential to fully transition new construction off fossil fuels.	Software evaluation will continue as an ongoing project.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238140.001	William Allen (ConSol)	Increasing the usability of air distribution systems with uninsulated ducts would lead to an increase in the use of ducts in conditioned space, which would in turn lead to statewide energy savings. The proposed changes to the Energy Code (Section 150.0(m)1B) would reduce these savings.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139

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238140.002	William Allen (ConSol)	It is ConSol's position that these changes are overly restrictive for the following reason: It is true that there will be more heat exchange between air inside and outside the duct if the duct is uninsulated than there would be if it were insulated. This attenuation would not, however, lead to any additional energy use as the conditioning would be delivered to the conditioned space and not lost to outside or unconditioned space. The issue of distant rooms being underserved due to this attenuation should not be seen as a reason to restrict the use of uninsulated ducts: all duct systems will suffer losses due to attenuation and this can, and should, be accounted for by proper design and balancing.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238140.003	William Allen (ConSol)	It is ConSol's position that these changes are overly restrictive for the following reason: Condensation will occur on surfaces that are below the dew point of the surrounding air. The issue is whether the quantity of liquid condensed on a surface will be sufficient to become a problem. The Western Cooling Efficiency Center (WCEC) at UC Davis analyzed the potential for condensation (see PDF page 4). ConSol believes that it is reasonable to conclude from this analysis that condensation on uninsulated ducts in conditioned space is not an issue that needs regulation by the Energy Commission. The level of condensation that can be expected is no more than might be seen on, for example, cold water pipes, which are not required to be insulated. The thickness of the layer of condensation that could be expected in the worst-case scenario for this analysis is 0.2 thousandths of an inch. This thickness is too low to allow for beading and there is therefore no possibility of the condensation pooling to create moisture damage.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238140.004	William Allen (ConSol)	It is ConSol's position that these changes are overly restrictive for the following reason: Any duct material is required to meet the standards of UL 181 which covers resistance to mold growth.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238140.005	William Allen (ConSol)	It is ConSol's position that these changes are overly restrictive for the following reason: Insulating ductwork has a cost in both materials and labor. Requiring insulation which provides no energy benefits is contrary to the Warren-Alquist Act.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238140.006	William Allen (ConSol)	It is ConSol's position that these changes are overly restrictive for the following reason: The use of uninsulated ducts in cavities in conditioned space is allowed under the International Residential Code (section N1103.3.1), the International Energy Conservation Code (R403.3.1), and every state building code in the United States, including the current California Code.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139

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238140.007	William Allen (ConSol)	It is ConSol's position that these changes are overly restrictive for the following reason: (Imposing) tighter restrictions on their use in the 2022 Energy Code without evidence of likely harm is damaging to the State's energy efficiency goals	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238140.008	William Allen (ConSol)	To allow the use of uninsulated ducts while minimizing the concerns surrounding condensation, it would be logical to amend the current code to ensure that any cavity containing an uninsulated duct should be reasonably well sealed, by amending the current language to allow ducts in cavities and require a visual inspection of any penetrations into such cavities. See recommended language on PDF page 5.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238139
238141.001	Marilynn Smith (Mothers Out Front)	See Comment 238138.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238141
238143.001	John Davenport (Energy Focus)	The impact of (the negative effects associated with flicker) have been largely mitigated by California's modest requirement to limit flicker to less than thirty percent. We urge the Energy Commission to not deregulate a market that is largely hitting the mark when it comes to meeting California's flicker requirement. Removing the JA8.4.6 standard on flicker would allow for a flood of poorly-made, high-flicker, and potentially health compromising lamps to enter the marketplace – and rob California of its role as a thought leader in the world of building efficiency and human-centric design.	There is no proposed changes or removal of the JA8.4.6 standard for the flicker reduction testing in JA8, and the comment is incorrect about the removal of the JA8.4.6 standard.	6/7/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238143
238155.001	Kevin Ma (Mothers Out Front)	See Comment 238138. NOTE: This is a minor variation on that comment letter.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238155
238158.001	CASE Team	Recommended change to DOAS provisions. The DOAS pathway utilizing the economizer exception listed under Section 140.4(p)1B in the 45-Day Express Terms was consolidated into Exception 6 to 140.4(e) through the following change: DOAS unit sizing requirements of at least 0.3 CFM/square foot (Section 140.4(p) 1Bi in 45-Day Express Terms) were moved to subsection B to Exception 6 of Section 140.4(e). [See language pdf pages 6-18]	Staff appreciates work done to simplify code language and outreach to stakeholders and have accepted these changes.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238158
238158.002	CASE Team	Recommended change to DOAS provisions. The DOAS pathway utilizing the economizer exception listed under Section 140.4(p)1B in the 45-Day Express Terms was consolidated into Exception 6 to 140.4(e) through the following change: Exhaust air heat recovery ratio requirements (Section 140.4(p)1Bii in 45-day Express Terms) were moved to subsection A to Exception 6 of Section 140.4(e). [See language pdf pages 6-18]	Staff appreciates the simplification of the standards and have accepted the changes.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238158

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238158.003	CASE Team	Recommended change to DOAS provisions. The DOAS pathway utilizing the economizer exception listed under Section 140.4(p)1B in the 45-Day Express Terms was consolidated into Exception 6 to 140.4(e) through the following change: Exhaust air heat recovery bypass control requirements (Section 140.4(p)1Biii in 45-Day Express Terms) were moved to subsection A to Exception 6 of Section 140.4(e). [See language pdf pages 6-18]	Staff appreciates the simplification of the standards and have accepted the changes.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238158
238158.004	CASE Team	Recommended change to DOAS provisions. The DOAS pathway utilizing the economizer exception listed under Section 140.4(p)1B in the 45-Day Express Terms was consolidated into Exception 6 to 140.4(e) through the following change: Section 140.4(p)1 in the 45-Day Express Terms was deleted through this consolidation. [See language pdf pages 6-18]	Staff appreciates the simplification of the standards and have accepted the changes.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238158
238158.005	CASE Team	Recommended change to DOAS provisions. The DOAS pathway utilizing the economizer exception listed under Section 140.4(p)1B in the 45-Day Express Terms was consolidated into Exception 6 to 140.4(e) through the following change: Subsections under 140.4(p) were renumbered. [See language pdf pages 6-18]	Staff appreciates the simplification of the standards and have accepted the changes.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238158
238158.006	CASE Team	Recommended change to DOAS provisions. The DOAS requirements under Section 140.4(p)3 & 140.4(p)4 of the 45-Day Express Terms were consolidated and clarified into one subsection: Section 140.4(p)3. These changes addressed configurations such as floor-by-floor air handler designs which were unclear in the 45-Day Express Terms. [See language pdf pages 6-18]	Staff appreciates the simplification of the standards and have accepted the changes.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238158
238158.007	CASE Team	Recommended change to DOAS provisions. Minor changes were made to the Exhaust Air Heat Recovery requirements listed under Section 140.4(q) of the 45-Day Express Terms. Section 140.4(q)3 was deleted along with now outdated references in Table 140.4-G and Table 140.4-H. These changes were related to the deleted pathway from 140.4(p)1A of the 45-Day Express Terms. [See language pdf pages 6-18]	Staff appreciates the simplification of the standards and have accepted the changes.	6/8/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238158
238186.001	Hope Salzer	I urge you, beg you in fact, to summon the courage to support building energy codes that reflect the stringency required of current climate circumstances. In other words, prohibit the installation or replacement of natural gas appliances of any kind, interior or exterior, require installation of EV chargers with home upgrades over \$3K, and require full electrification by 2030 for any income-producing property (residential or commercial) in order for that property to retain its Prop 13 subsidy (those that don't want to electrify completely can have their property value reassessed to market-rate and pay property tax on that new valuation. This is another area where Californians subsidize the burning of fossil fuels by subsidizing rental properties which burn fossil fuels and foist the externalized costs onto the public. Thank you for considering these ideas and for reducing fossil fuel emissions as rapidly as possible. This will likely be inconvenient to many but it is very necessary and long, long overdue.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/11/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238186

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238196.001	Jeff Stein (Taylor Engineering)	Please restore section 140.9(a)1 to the version in the Submeasure Summary dated 3/16/2020. [language pdf page 3]	NOTE: The next 12 comments are arguments made in support of the proposal. In general, the reason that the proposal was not accepted as presented is that this would require a larger jump in temperature thresholds for water economizers than for air economizers. To ensure that one economizer technology is not affected more stringently than another, the technologies of air and water economizer were kept separate and raised by a similar temperature threshold.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.002	Jeff Stein (Taylor Engineering)	The version in the Submeasure Summary will impact designs and result in real, cost-effective energy savings. The current proposed version will not result in real savings. Raising the air economizer DB from 55F to 65F will have minimal real savings. Per the definition of air economizer, any system directly supplying outside air to eliminate mechanical cooling will have no trouble meeting the load if the OADB is 65 since SAT >=70F is standard practice for data centers. Any air economizer system that meets the 55F threshold also meets the 65F threshold.	The 70F supply air temperature is currently not a requirement. This may result in some air economizer designs that may have higher approach temperatures. So we cannot assume that all facilities are using 70F supply air temperatures. Note that supply air temperature requirements are included in the proposed language but still would not require 70F supply.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.003	Jeff Stein (Taylor Engineering)	Raising the water economizer DB threshold from 40F to 50F has no value since a water economizer, by definition, uses water evaporation to offset mechanical cooling, and water evaporation depends only on the wetbulb, not the drybulb. The current proposed version raises the water economizer WB from 35F to 45F, but this is still well below the 50F value that was shown to be cost effective in the CASE report.	The reason that the temperature threshold was raised by 10F was to mirror the temperature threshold increase for air side economizers from 55F to 65F. Raising the temperature threshold for water economizers would be a larger incremental increase than for air economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.004	Jeff Stein (Taylor Engineering)	So the air and water economizer sections are largely unchanged but now there are several new options and exceptions that dramatically weaken the standard, most notably the pumped refrigerant economizer with a threshold of 50F, or 40F if using exception 3.	The air and water economizer sections were updated with new temperature threshold requirements. Note that Exception 3 was removed. Note that prescriptive options for pumped refrigerant economizers were not adopted due to additional analysis needed to show equivalent performance for refrigerant pump economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.005	Jeff Stein (Taylor Engineering)	A pumped refrigerant economizer meeting 50F DB (and certainly at 40F DB) will not come close to matching the energy efficiency of an air economizer meeting the load at 55F DB or a water economizer meeting the load at 50F WB or even 45F WB.	Note that prescriptive options for pumped refrigerant economizers were not adopted due to additional analysis needed to show equivalent performance for refrigerant pump economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.006	Jeff Stein (Taylor Engineering)	There is no need for a separate pumped refrigerant economizer prescriptive option. A single prescriptive economizer requirement at 65F DB / 50 WB provides all the flexibility needed. There are air economizer, water economizer and pumped refrigerant economizer options that meet 65DB/50WB. Note that if water reliability is a concern and the data center is too many stories to use air-economizing then air-cooled chillers with fluid coolers, or evaporative pre-coolers can be used (rather than dry coolers).	Using a single temperature threshold would affect water economizers more than air economizers and may be seen as pushing air economizers. To ensure a more equal change in air and water economizers the two were kept separate. Note that prescriptive options for pumped refrigerant economizers were not adopted due to additional analysis needed to show equivalent performance for refrigerant pump economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196

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238196.007	Jeff Stein (Taylor Engineering)	The computer room economizer requirements were put into Title 24 in 2013 (delayed from 2011) and were the first time Title 24 had any computer room requirements. As such they were a conservative, first step to get a foot in the door. The original version of the water economizer requirement for the 2013 version was 40F. This analysis was done in 2008 and was based on the fact that containment was not common and that computer room supply air temperatures of 55-60F were common. Since 2008 great strides have been made in improving computer room efficiency (driven in no small part by Title 24 and 90.1). Now containment is ubiquitous and supply air temperatures of 70-80F are the norm. The CASE Report shows that water economizers can easily and cost-effectively be sized to meet 100% of the load at 50F WB. Leaving the WB threshold at 35F is a shame. It means a designer can use undersized cooling towers (e.g. 15F approach vs 6F approach) and put in a tiny heat exchanger (e.g. 10F approach) that will have a fraction of the energy savings of a reasonably sized HX (e.g. 3F approach).	The wet bulb temperature for water economizer requirements were revised upward. The reason that the temperature threshold was raised by 10F was to mirror the temperature threshold increase for air side economizers from 55F to 65F. Raising the temperature threshold for water economizers would be a larger incremental increase than for air economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hc=238196
238196.008	Jeff Stein (Taylor Engineering)	One of the many faults with the most common pumped refrigerant economizer on the market is that it is not fully integrated. It has 2 refrigerant circuits that can either be on compressor or economizer pump. If a circuit switches to economizer pump the economizer may only be able to achieve a small fraction of the load so the controls must wait until the DB is low enough for the economizer to meet enough of the load to make up for the loss of the compressor. So at best this product is half way between integrated and non-integrated. Unfortunately, "integrated" is not defined in the standard.	Note that prescriptive options for pumped refrigerant economizers were not adopted due to insufficient additional analysis showing equivalent performance for refrigerant pump economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hc=238196
238196.009	Jeff Stein (Taylor Engineering)	My direct experience with this pumped refrigerant economizer on real data centers is that it does not come close to achieving the PUE of data centers with air or even water economizers, when compared on an apples-to-apples basis (similar climate, load ratio, etc.). Hopefully the CEC will not make a decision based only on glossy marketing and biased energy models put forth by the refrigerant economizer manufacturer, but instead will insist on real data from real projects showing similar or better efficiency than air or water economizer systems.	Note that prescriptive options for pumped refrigerant economizers were not adopted due to insufficient additional analysis showing equivalent performance for refrigerant pump economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hc=238196
238196.01	Jeff Stein (Taylor Engineering)	One of the reasons the Submeasure Summary got rid of air and water and simply refers to "economizer" is because many data center economizer systems do not meet the definitions of air or water economizer. For example an air-cooled chiller with an integrated dry cooler (ACC-IDC) is not an air economizer because it is not "a ducting arrangement, including dampers, linkages, and an automatic control system that allows a cooling supply fan system to supply outside air to reduce or eliminate the need for mechanical cooling." It also does not meet the water economizer definition: "...the supply air of a cooling system is cooled directly or indirectly by evaporation of water, or other appropriate fluid..." And it is clearly not a refrigerant economizer.	The definitions for air economizer and water economizers are included in the building code. If the economizer system does not meet these requirements than that system would need to follow the performance pathway rather than the prescriptive path. Additional clarification was made for water economizers due to apparent confusion of the water economizer definition.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hc=238196

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238196.011	Jeff Stein (Taylor Engineering)	An air-cooled chiller with a dry-cooler is clearly an economizer. So the user gets to decide which type it is. The user will of course choose water economizer because it lists the lower drybulb of 50F. (why else would the water economizer list a drybulb, they will argue). Users will also claim they meet Exception 3 and/or Exception 4 to get away with a 40F drybulb. This is also a shame because an air-cooled chiller with a dry-cooler is not an efficient design, even at 50F, and especially at 40F. An air-cooled chiller with a dry-cooler will not meet the PUE requirement in ASHRAE 90.4-2019, as shown in the table below. Taylor Engineering serves on 90.4. We performed the analyses below that were used to raise the bar in 90.4-2019. [table on pdf page 5]	There are specific requirements for air economizers and water economizers per the definitions in the energy code. If a design does not meet these definitions than the system would need to go through the performance option. Clarification to the water economizer language was added due to confusion of the water economizer definition.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238196
238196.012	Jeff Stein (Taylor Engineering)	So while ASHRAE and the rest of the country is moving forward with data center efficiency standards, California is clearly moving backwards, lowering the bar for data center efficiency standards. For comparison, the same analysis we performed for 90.4 showed a PUE of 1.055 for an air-cooled chiller with air-economizer in zone 3C (including disabling the air economizer outside the TC9.9 humidity envelope). So the system with the dry cooler uses 3 times as much energy as the system with the air economizer.	Prescriptive requirements for air, water and proposed refrigerant economizers apply to specifically identified systems based on the definition of the economizer type. To address misinterpretations of what is allowable some educational outreach may be required. Outside of these defined systems prescriptive requirements cannot be applied to those economizer systems. Note that prescriptive options for pumped refrigerant economizers were not adopted due to insufficient additional analysis showing equivalent performance for refrigerant pump economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238196
238196.013	Jeff Stein (Taylor Engineering)	After T24-2013 went into effect . . . some (data center) designs were botched, resulting in reliability issues and colo SLA violations. (We know because we have been hired to fix several botched economizers at data centers in CA). These botched designs, combined with aggressive marketing by the (DSE) refrigerant economizer and air-cooled chiller with integrated drycooler (ACC-IDC) vendors, convinced some data center owners to switch to DSE or ACC-IDC for recent designs, particularly outside California, where these systems meet code (90.4-2019 is not in effect yet in most of the country). I would argue that DSE and ACC-IDC do not meet the prescriptive code in CA but vendors of DSE and ACC-IDC have successfully argued otherwise in many cases. After no improvements in the Title 24 computer room economizer requirements for 9 years, the 2022 CASE team demonstrated that significant improvements were cost effective, as shown in the Submeasure Summary and CASE report. When the DSE and ACC-IDC vendors got wind of the changes they rallied their recent customers and trade association to lobby the CEC and Statewide Team, which appears to have capitulated on improving the standard and gone one further by weakening it. The solution to botched design, of course, is proper engineering, construction and commissioning. Just like DSE and ACC-IDC, air/water economizers can be reliable, or not, depending on the quality of the design and installation.	The air and water economizer requirements were revised to increase the temperature threshold when full economizing is required.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238196

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238196.014	Jeff Stein (Taylor Engineering)	Revise Exceptions 3 to 140.9(a)1 as follows: If the local water authority does not allow cooling towers the cooling system shall include an integrated economizer capable of providing 100 percent of the expected system cooling load at 65°F to 80.6°F supply air temperature at outside air temperatures of 55°F dry-bulb and below or 50°F wet-bulb and below, and be equipped with a fault detection and diagnostic system as specified by section 120.2(j).	Note that prescriptive options for pumped refrigerant economizers were not adopted due to additional analysis required to show equivalent performance for refrigerant economizers and Exception 3 to 140.9(a)1 was removed because the inclusion or absence of cooling towers would not affect air economizers or refrigerant economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.015	Jeff Stein (Taylor Engineering)	There is already at least one truly integrated pumped refrigerant economizer whose system is capable of meeting 100% of the load at 65F DB and likely others that can meet the load at 55F DB.	Note that Exception 3 to 140.9(a)1 was removed because the inclusion or absence of cooling towers would not affect air economizers or refrigerant economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.016	Jeff Stein (Taylor Engineering)	From our research, there are multiple aircooled chiller with integrated drycooler vendors whose products can meet 100% of the load at 55F DB. Note: our analyses were based on 90% load on the chiller. Redundancy between 10% and 50% is standard in data centers and can be counted towards prescriptive compliance.	Note that Exception 3 to 140.9(a)1 was removed because the inclusion or absence of cooling towers would not affect air economizers or refrigerant economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.017	Jeff Stein (Taylor Engineering)	Restore the Heater Recovery proposal in the CASE Report.	This measure was not pursued as part of the Energy Code update. This was due to some additional considerations that the Energy Commission would like to consider around the installation of the space required for heat recovery equipment. Based on the technology used, this space requirement may be significant.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.018	Jeff Stein (Taylor Engineering)	Per the CASE report, computer room heat recovery is cost effective. The CASE report proposal is conservative and only covers a small fraction of computer rooms. It is almost certainly cost effective in many more cases not covered by the proposal.	This measure was not pursued as part of the Energy Code update. This was due to some additional considerations that the Energy Commission would like to consider around the installation of the space required for heat recovery equipment. Based on the technology used, this space requirement may be significant.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.019	Jeff Stein (Taylor Engineering)	Electrification and reducing natural gas use is a major focus in California. As such there are many new requirements in Title 24-2022 that require heat pumps for space and water heating, such as schools, office buildings and libraries. Many of these new requirements have negative cost-effectiveness. Heat pumps are higher first cost, higher maintenance, and higher energy cost than gas heating. But it makes sense from a societal perspective based on climate change.	This measure was not pursued as part of the Energy Code update. This was due to some additional considerations that the Energy Commission would like to consider around the installation of the space required for heat recovery equipment. Based on the technology used, this space requirement may be significant.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.02	Jeff Stein (Taylor Engineering)	An air-source heat pump for a school or office has a heating COP of around 2.0. Computer room heat recovery can have a heating COP anywhere from 4.0 (heat recovery chiller) to 10.0 (direct air transfer). And this does not include the free cooling!	This measure was not pursued as part of the Energy Code update. This was due to some additional considerations that the Energy Commission would like to consider around the installation of the space required for heat recovery equipment. Based on the technology used, this space requirement may be significant.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.021	Jeff Stein (Taylor Engineering)	If we are serious about electrification, then we should start with the low hanging fruit. Computer room heat recovery is about as low hanging as it gets.	This measure was not pursued as part of the Energy Code update. This was due to some additional considerations that the Energy Commission would like to consider around the installation of the space required for heat recovery equipment. Based on the technology used, this space requirement may be significant.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196

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238196.022	Jeff Stein (Taylor Engineering)	Data center heat recovery is extremely low risk and increasingly accepted. We know of at least three tech companies in the Fortune 50 that routinely recover heat from their data centers for space heating.	This measure was not pursued as part of the Energy Code update. This was due to some additional considerations that the Energy Commission would like to consider around the installation of the space required for heat recovery equipment. Based on the technology used, this space requirement may be significant.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.023	Jeff Stein (Taylor Engineering)	Restore the PUE Monitoring proposal in the CASE Report.	The PUE monitoring proposal was not identified to be pursued because there is not a direct savings between monitoring and energy savings. Although PUE monitoring could identify potential issues there are still additional steps that need to be taken in regards to identifying a problem and fixing it.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.024	Jeff Stein (Taylor Engineering)	This is a no cost requirement with a huge upside. All large data centers, to which this applies, already collect this data. The requirement simply standardizes the calculation of PUE. Most importantly, this paves the way for a California Data Center Energy Benchmarking Program, similar to the California Building Energy Benchmarking Program, which allows anyone to see the site EUI of the thousands of benchmarked buildings in CA.	The PUE monitoring proposal was not adopted because there is not a direct savings between monitoring and energy savings. Although PUE monitoring could identify potential issues there are still additional steps that need to be taken in regards to identifying a problem and fixing it.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.025	Jeff Stein (Taylor Engineering)	EUI is not a particularly interesting or useful metric because it gives little insight into the energy efficiency of a building and thus little incentive to change behavior. This is because EUI varies greatly based on building program, occupancy, whether the building includes computer rooms, labs, a call center, runs 24/7, etc. PUE of a large data center, on the other hand, is a very accurate measurement of energy efficiency. This is because the load is almost entirely IT (e.g. almost no envelope or people loads) and PUE is normalized to the IT load.	The PUE monitoring proposal was not adopted because there is not a direct savings between monitoring and energy savings. Although PUE monitoring could identify potential issues there are still additional steps that need to be taken in regards to identifying a problem and fixing it.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.026	Jeff Stein (Taylor Engineering)	There is no consensus of what a good EUI is for an office building and thus no embarrassment by a high EUI. In contrast, everyone in the data center business knows a good or bad PUE. Owners of poorly performing data centers will be highly incentivized to design and operate their data centers to improve PUE. The actual efficiency of their data centers is of little interest to many data center owners and operators because no one can see it. The folks running the data centers on a daily basis are rarely incentivized by efficiency. They are incentivized by uptime. Consequently, it is common for operators to disable economizers and otherwise undermine efficiency to keep it simple. What would happen if the New York Times ran an article comparing the efficiency of data centers in CA owned by high profile companies? The incentive to save energy would be massive.	The PUE monitoring proposal was not adopted because there is not a direct savings between monitoring and energy savings. Although PUE monitoring could identify potential issues there are still additional steps that need to be taken in regards to identifying a problem and fixing it.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.027	Jeff Stein (Taylor Engineering)	Revise Exception 2 part ii to "The economizer system has the ability to deliver either the computer room ITE design load or 5 tons."	This exception was revised. The original language that was originally struck out was reinstated. This is because the original language is easier to follow and enforce.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196

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238196.028	Jeff Stein (Taylor Engineering)	This exception has been narrowed down to just rooms <20 tons. And the "25% of economizer capacity" only applies to rooms over 5 tons. The intent in the Submeasure Summary of limiting it to "available economizer capacity on the same floor and within 30 feet" is because it may not always be cost effective (or possible) to oversize the ductwork to the computer room. Deleting "available economizer capacity" and replacing it with "25% of the economizer system capacity" does not address this problem because the house air system with the economizer is often quite large (e.g. over 75 tons), serving multiple floors and large floor areas. So changing it to "25% of the economizer capacity" effectively requires the economizer system to meet the full computer room load. Capping it at 5 tons will not result in a significant loss of energy savings for the handful of rooms between 5 and 20 tons, in part because they still have to put in at least 5 tons. Computer rooms are rarely fully loaded so 5 tons may be the whole load most of the time, anyway. And the ones that can reasonably be designed to meet the design load (e.g. 10 tons) will probably do so anyway because the incremental cost is small and the benefit in energy and/or reliability could be significant.	This exception was revised. The original language that was originally struck out was reinstated. This is because the original language is easier to follow and enforce.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.029	Jeff Stein (Taylor Engineering)	Revise 141.1(b).1 to match 140.9(a)1 per Comment 1. [comment #238196.001]	The requirements for air and water economizer were kept separate. This was to ensure that one technology type was not revised more stringently than another. Note that the pumped refrigerant economizer prescriptive options were not adopted due to additional analysis needed to show equivalent performance for refrigerant pump economizers.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238196.03	Jeff Stein (Taylor Engineering)	Add a definition of an integrated economizer, specific to computer rooms. The definition should make it clear that the economizer should be capable of meeting any fraction of the load (between 1% and 100%), while the refrigerant compressor meets the remaining load fraction (between 99% and 0%).	Clarification language for integrated economizers were added into code language in 140.9(a)1 and 141.1(b)1. This does not match exactly the definition here.	6/14/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238196
238197.002	Codes and Standards Enhancement (CASE) Team	2. (Occupancy Sensing Control Requirements) Section 130.1(c)5 has been updated for simplification but also results in a reduction in stringency as non-general lighting in the specified areas are no longer required to install occupancy sensors. Additional simplification, without reducing stringency, can be achieved by requiring the control of all lighting in small offices, multipurpose rooms, classrooms, conference rooms, and restrooms instead of general lighting, and by the use of exceptions to clarify when a simple on/off occupancy sensor can be used. Also, the commenter suggested to delete Section 130.1(c)1D of "Separate controls for general, display, ornamental, and display case lighting".	In response to stakeholder's comment, deleted this requirement instead of the proposed general lighting occupancy sensing control requirements. In response to stakeholder's comment, deleted Section 130.1(c)1D of "Separate controls for general, display, ornamental, and display case lighting".		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238197
238197.003	Codes and Standards Enhancement (CASE) Team	3. (Automatic Daylighting Control Requirements) Exceptions 4 and 5 to Section 130.1(d) can be interpreted to mean all daylighting controls in all daylight zones are exempted, but these exceptions are intended to apply only to the secondary sidelit daylight zones.	In response to stakeholder's comment, revised Exception 4 and 5 to Section 130.1(d) that they are exceptions to the daylighting controls in secondary sidelit daylight zones to the 15-day language.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238197

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238197.004	Codes and Standards Enhancement (CASE) Team	4. (Area Category Method) Table 140.6-C have been updated but formatting has made some LPDs ambiguous in terms of which area they apply to. The additional allowance LPD for Lobby and Main Entry area was also not updated to the value proposed by the Statewide CASE Team in the Nonresidential Indoor Lighting CASE Report. Lastly, the Statewide CASE Team is recommending increasing the LPD slightly for the Barber, Beauty Salon, Spa Area to support a greater range of applications.	In response to stakeholder's comment, updated the formatting of Table 140.6-C for Concourse and Atria Area and Concourse and Atria Area. Updated additional decorative/display lighting power allowance of cafeteria/fast food under the dining area category. Updated additional decorative/display lighting power allowance of Lobby/Main Entry.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238197
238197.005	Codes and Standards Enhancement (CASE) Team	5. Proposed Code Language This is the commenter's version of the Code language in their perspective for the commented items #2 thru #4 aforementioned.	Staff appreciates the commenter's version of the Code language.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238197
238206.001	National Lighting Contractors Association of America	NLCAA's understanding of this code section is as follows: 1.All NRCAs must be submitted to the data registry approved by the Commission, except NRCAs recorded by an ATTCP. For example, an NRCA generated for an elevator test will be submitted to the data registry approved by the Commission. 2.ATTCPs will not submit NRCAs to the data registry approved by the Commission. 3.Can the CEC clarify if NLCAA's understanding is correct?	1. NRCA that must be completed by a certified ATT (NRCA for lighting controls (130.4) and mechanical system (120.5) acceptance testing) and recorded by an ATTCP are exempt from the registration requirements and submittal to a data registry. 2. The person responsible for completing the form will submit any required documentation to an approved registry. ATTCPs do not submit forms to a data registry. 3. Responses to 1 and 2 clarify the intent of these requirements. Staff will consider clarifying regulatory language in the 2025 code update.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238206
238206.002	National Lighting Contractors Association of America	Can 10-102 provide a definition for: 1. Electronic Database System - 10-103.1(c)3(H). 2. Electronic Document Repository - 10-103.1(c)3(I)(ii).	1. The term "electronic database system", where used in existing and proposed code language, has its ordinary meaning consistent with a common understanding of the term. No specific definition for this term is required for understanding or execution of the associated code provisions. 2. The definition is located in Reference Joint Appendix JA7.2. See JA7.2 definition "Commission Compliance Document Repository (also known as an electronic document repository)."		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238206
238206.003	National Lighting Contractors Association of America	Section 10-103.1(c)3(I)(i). 1. Clarify how an ATTCP is to record NRCC and the NRCCs and/or in what format (e.g., XML, JPG, PNG, PDF, picture, electronic, etc.). 2. After review of 10-103(a)1, 10-103(a)3, 10-103(a)4 and 10-103.1(c)3(I) NLCAA is unclear if there will be a requirement for the ATTCPs to submit any compliance documents other than the NRCAs (NRCC, NRCC, etc.) to a data registry approved by the Commission or the Electronic Document Repository. 3. Can the CEC clarify what the ATTCPs are required to do with the compliance documents (excluding the NRCA)?	1. The NRCC and NRCC can be recorded in PDF format, however other methods can be used to record these documents. 2. ATTCPs are not required to submit compliance documents to a data registry. The responsible person signing the form is required to submit applicable compliance documents to a data registry. ATTCPs are required to submit NRCC, NRCC and NRCA forms and/or data to an approved document repository. 3. The intent of the requirement to record NRCC and NRCC is to allow the ATTCP to utilize these documents for conducting QA and also to allow the CEC to access these documents through		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238206

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238206.004	National Lighting Contractors Association of America	4.Section 100.1(b) Lighting definitions NLCAA recommends removing all indented and sub-definitions (of lighting definitions). Or if indenting remains, lighting control devices are found under the lighting definition or found in alphabetical order of Section 100.1 This is inconsistent and confusing when searching for device definitions.	<p>I. The indent of some of the lighting definitions can be removed when the removal of indentation may help the reading of the text.</p> <p>II. The NLCAA comment may be true to the new code users. On the other end of the spectrum, those who has used the Code for sometimes or for a long time, they may very well know where to look for the lighting definition (all in one location with the staring phrase "lighting definition").</p> <p>The NLCAA suggested change may actually hurt this group of code users as a result of the suggested change. It appears the NLCAA comment is the only comment expressed during this comment period for about requesting changes to the lighting definitions in this Code Cycle.</p> <p>The lighting definitions have been updated in alphabetical order in this Code Cycle based on inputs from stakeholders and this change should have help in reading the code.</p> <p>Based on the above consideration, staff does not recommend any further revision changes to the lighting definition as requested by this comment. Staff suggests to re-order the lighting definitions so that they follow alphabetical order. (Watch list for 2025 Code Development)</p>	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238206
238206.005	National Lighting Contractors Association of America	Section 110.12(a)A and B are not clearly explaining the differences between each other and how they must be applied. This code is understood, misapplied, and argued in the field consistently. 1. There is added confusion when you review NA7.6.3.1 Construction Inspection codes and the NRCA-LTI-04-A procedures. 2. Please provide a clear explanation in the Blueprint Newsletter, many entities do not accept Compliance Manual clarifications. 3. Please ensure that the Compliance Manual has a clear explanation of this code section and how it is to be applied to the various scenarios.	Staff have reached out to this stakeholder for additional information and suggestions for how to improve the code language. As most of the stakeholder's concerns deal with guidance documents such as the Blueprint Newsletter and Compliance Manuals, staff will ensure that this issue is addressed in both.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238206
238212.001	Jim Petersen (Lennar Corporation)	We are therefore disappointed to see that the Express Terms include language that would reduce our options for conditioned air distribution by effectively banning the use of uninsulated ducts in conditioned space. Section 150.0(m)1B, covering duct insulation requirements, would only allow uninsulated ducts in fully exposed locations, which is not a realistic option for obvious aesthetic reasons.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238212
238212.002	Jim Petersen (Lennar Corporation)	The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238212

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238212.003	Jim Petersen (Lennar Corporation)	There is no requirement for insulation on ducts in conditioned space in either the IRC or the IECC, and no US state requires ducts in conditioned space to be insulated. As a national builder, the need to change designs for the California market will impact our overall costs and our ability to deliver efficient houses to California customers.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238212
238212.004	Jim Petersen (Lennar Corporation)	While we understand the Commissions caution regarding potential condensation issues, uninsulated metal ducts have been used in the Midwest for decades. Many Midwest States experience higher humidity levels than California and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238212
238212.005	Jim Petersen (Lennar Corporation)	We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be amended to allow the unrestricted use of uninsulated ducts in the building's conditioned space. This can be simply achieved by amending Section 150.0(m)1B to read: "Portions of supply-air and return-air ducts and plenums of a space heating or cooling system outside of the buildings conditioned space shall be insulated to a minimum installed level of R-6.0"	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238212
238217.001	Pierre Delforge (National Resources Defense Council)	NRDC supports the updated fan efficiency requirements both as proposed in the IOU's CASE report and in the 45-day language.	Staff appreciates the supportive comment, and understands the commenter's concern.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238212
238217.002	Pierre Delforge (National Resources Defense Council)	While we support the adjustments made in the 45-day language, we would oppose any further weakening of the fan requirements, in particular as they relate to packaged systems.	Staff appreciates the comment supporting the proposed amendments. Some identified areas within the fan requirements for additions and alterations were reduced to allow replacements for cases that would not be a new duct design.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238212
238217.003	Pierre Delforge (National Resources Defense Council)	It is notable that fan energy use of these packaged systems is not currently captured in the federal test procedure or standard and therefore the only current way to address this fan energy use is through how these units are applied as allowed by building codes. While there was an agreement to amend test procedures for these units by 2019 to include fan energy use, DOE has not taken any action on this test procedure. Given the lack of federal action to reduce fan energy use in packaged units, addressing this energy use through how these units are applied under code as proposed is reasonable and will result in significant energy savings.	Staff appreciates the comment supporting the proposed amendments.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238212
238217.004	Pierre Delforge (National Resources Defense Council)	1. We do not support the newly added exception 4 to Sections 130.2(c)3 and 160.5(c)2C which would exempt parking lot luminaires less than 78 watts from motion sensing control requirements. We recommend that these luminaires continue to be required to comply with motion sensing control requirements. 2. We also recommend that the acceptance test for automatic scheduling controls for outdoor lighting proposed in the draft express terms be reinstated.	1. The change was introduced in the 45-day Express Term as an alignment to the parking lot luminaires exception in 2021 IECC. Comments submitted in docket all oppose the the newly added exception 4 to Sections 130.2(c)3 and 160.5(c)2C. The Commission considers the comment not supporting the newly added exception; after consideration staff has reverted the language to the existing 2019 Standards language.. 2.The acceptance test for automatic scheduling is still there in nonresidential appendices - NA7.8.5.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238212

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238217.005	Pierre Delforge (National Resources Defense Council)	We support the language originally proposed in the draft express terms which would have required roof decks (i.e. the sheathing layer on top of a roof's structural members) of newly constructed attic systems to be insulated to a U-factor of 0.178. The 45-day language weakens this proposed requirement by increasing the U-factor allowed to 0.184, exempting climate zones 1-3 and 5-7, and exempting buildings with ducts and air handlers in conditioned space. We do not support this weakening and recommend that the CEC revert back to the language proposed in the draft express terms.	In response to stakeholder concerns over basing the U-factor on above deck insulation, the proposal was revised to assume R-4 below deck insulation.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238217
238217.007	Pierre Delforge (National Resources Defense Council)	We support the strengthening of Exception 2 to Section 150.0(k)2F, which reduces the threshold for an exemption from the dimming control requirements from 50 watts to 20 watts. This threshold makes sense given the low wattage and increased efficacy of LED fixtures. For example, a central bedroom light fixture could easily fall under the 50-watt threshold (and may still fall under the 20-watt threshold) but dimming controls would likely save energy in this application.	The Commission appreciates the comment supporting the proposed amendment.	6/15/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238217
238224.001	Jeanne Brown	Our children will thank us if they see that we are taking real steps towards a regenerative energy future. "Natural" gas should not be part of that future. I have an electric car and 27 solar panels. I am trying to do my part. I hope that I can eventually get rid of my natural gas but for new buildings, don't force people to have to convert later. Do it for them now. Please! Your children will thank you.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238224
238227.001	J Wang	Thank you for the important work that you do. The importance of your work is no more relevant today, when we face a climate crisis. Building decarbonization is key to achieving a zero-carbon future. Because of the longevity of buildings, to have any hope of taming our global temperature, we must NOT continue to build structures that emit carbon. Granted, any change to the status quo is difficult. But it'll be even more difficult to adapt to an increasingly unpleasant climate. Let's stop it now. So please mandate all-electric construction in this Title 24 update.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238227
238229.001	Robert Wilcox	We are in the midst of a climate emergency, and cannot afford to allow more carbonproducing infrastructure to be installed. This infrastructure will become a stranded asset in the coming years and require replacement with all-electric alternatives long before the end of their useful lives, which will cost much more in the long term. For the good of the planet, and the good of our future budget, we should require all electric construction as soon as possible.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238229

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238230.001	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Requiring Economizers on VRF is Neither Cost-Effective Nor Efficient. DOAS system attempting to increase VRF system efficiency by operating with direct outside air cooling under evening partial load conditions is attempting to improve VRF efficiencies when they are likely to be idling at their highest system efficiencies. One can compare the power demand of a compressor running at low-load times to the high fan power required to run an economizer during the same conditions and conclude they are at best a wash.	Staff notes that the prescriptive requirement in 140.4(e) are broadly applicable to air handlers and chilled water systems, irrespective of their use of variable refrigerant flow (VRF) components - the materials in the documents relied upon show that this requirement can be complied with using cost effective equipment. To the extent that a designer would prefer to forego economizing on a system that includes VRF components, the performance compliance approach is available to accommodate these designs via an overall assessment of energy efficiency in cases where system performance can be modeled as achieving efficiency targets without inclusion of economizing.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.002	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Requiring Economizers on VRF is Neither Cost-Effective Nor Efficient. To meet the .3cfm/sq.ft. economizer requirement, there must be a significant increase in fan energy for most applications as the result of shifting from predominantly recirculated air and fractional outside air to high outside air flows required to "economize". In essence, there's an energy trade-off between compressor energy and fan energy and it may amount to a zero sum gain in terms of energy consumption in many applications. This is even more likely to weigh against economizers now that MERV 13 filtration is required for DOAS systems, which can easily result in higher fan watt-draw. Actual efficiency of this fan versus compressor power trade-off will vary with several factors such as total length of ventilation ductwork, number of bends in the ducting, filter area, type of fans used in the ERV/HRV/DOAS, etc.	Staff notes that the prescriptive requirement in 140.4(e) are broadly applicable to air handlers and chilled water systems, irrespective of their use of VRF components - the materials in the documents relied upon show that this requirement can be complied with using cost effective equipment. To the extent that a designer would prefer to forego economizing on a system that includes VRF components, the performance compliance approach is available to accommodate these designs via an overall assessment of energy efficiency. The commenter asserts that fan energy use increases will be greater than compressor energy decreases for VRF systems, but does not provide any data supporting the assertion. Staff therefore finds that economizing is reasonably expected to be cost effective and energy saving for the majority of HVAC system designs, consistent with the intent of a prescriptive compliance option, and that situations for which economizing would not be preferred by the designer are accounted for via the performance option.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.003	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Requiring Economizers on VRF is Neither Cost-Effective Nor Efficient. Despite modeling performed on VRF-coupled economizers, they may not prove to be either efficient or cost-effective for most commercial applications (office, hotel, retail, multifamily residential, religious centers, etc.) since this requirement will result in a ventilation system which adds complexity, with marginal and variable efficiency gains. Oversizing the ventilation system by a factor of two above ASHRAE 62.1 requirements will inherently result in a system with lower operating efficiency for all run hours except the small subset of run hours where it is economizing. Inevitably, it will add unreasonable cost to VRF projects.	Staff notes that the prescriptive requirement in 140.4(e) are broadly applicable to air handlers and chilled water systems, irrespective of their use of VRF components - the materials in the documents relied upon show that this requirement can be complied with using cost effective equipment. To the extent that a designer would prefer to forego economizing on a system that includes VRF components, the performance compliance approach is available to accommodate these designs via an overall assessment of energy efficiency. The commenter asserts that economizers "may not prove to be either efficient or cost effective", but provides no specific data relating to situations where this may or may not be the case. Staff finds that economizing is reasonably expected to be cost effective and energy saving for the majority of HVAC system designs, consistent with the intent of a prescriptive compliance option in providing simplified requirements applicable to a majority of building designs, and that situations for which economizing would not be preferred by the designer for cost or performance reasons are accounted for via the performance option.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230

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238230.004	Doug Tucker and Bruce Severance (Mitsubishi Electric)	<p>VRF without Economizers Are More Efficient Than Roof Top Units with Them. VRF systems without economizers are far more efficient than code compliant RTU's with economizers. VRF systems with heat recovery are even more efficient in low-load conditions adding another 20% efficiency due to their ability to move waste BTUs from one zone to another without the refrigerant cycling through the compressor, resulting in a significant savings in compressor energy. VRF systems offer more diverse zone control and the ability to fully shut off unoccupied zones. This is not an option with central RTU type systems. These features lead us to question the desire to require economizers for VRF systems.</p>	<p>Staff notes that the prescriptive requirement in 140.4(e) are broadly applicable to air handlers and chilled water systems, irrespective of their use of VRF components - the materials in the documents relied upon show that this requirement can be complied with using cost effective equipment. To the extent that a designer would prefer to forego economizing on a system that includes VRF components, the performance compliance approach is available to accommodate these designs via an overall assessment of energy efficiency.</p> <p>The commenter asserts that VRF units without economizers are more efficient than rooftop units with economizers, however this is tangential to the question of whether VRF units benefit from economizing. Staff finds that economizing is reasonably expected to be cost effective and energy saving for the majority of HVAC system designs, consistent with the intent of a prescriptive compliance option in providing simplified requirements applicable to a majority of building designs, and that situations for which VRF would consume less energy than the standard design (which presumes minimal prescriptive compliance) can proceed via the performance compliance approach.</p>	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.005	Doug Tucker and Bruce Severance (Mitsubishi Electric)	<p>VRF without Economizers Are More Efficient Than Roof Top Units with Them. We suggest modeling this comparison of RTUs with economizers versus VRF and factoring all such variables, with and without refrigerant heat recovery (not to be confused with ERV heat recovery) in any commercial energy modeling program (eQUEST, EnergyPro, Energy Plus, Trane Trace, Carrier HAP, etc.). Our engineering team is confident, that VRF would win in this head to head comparison. We feel there is cause to question the modeling and cost trade-off analysis that found economizers on VRF systems to be "cost-beneficial".</p>	<p>Staff notes that the prescriptive requirement in 140.4(e) are broadly applicable to air handlers and chilled water systems, irrespective of their use of VRF components - the materials in the documents relied upon show that this requirement can be complied with using cost effective equipment. To the extent that a designer would prefer to forego economizing on a system that includes VRF components, the performance compliance approach is available to accommodate these designs via an overall assessment of energy efficiency.</p> <p>Staff finds that the information in the rulemaking record supports the adoption of the economizing provisions as proposed. To the extent that the commenter is confident that additional modeling of specific circumstances would support inclusion of an exception for VRF equipment, staff would invite the commenter to conduct this modeling and submit a complete code change proposal that includes this data in order for their proposed change to be considered in the next regular rulemaking proceeding.</p>	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230

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238230.006	Doug Tucker and Bruce Severance (Mitsubishi Electric)	VRF without Economizers Are More Efficient Than Roof Top Units with Them. Before making any changes in the terminal unit size for which economizers are required, we should consider revisiting the existing energy modeling data to see if different conclusions are reached based upon this comparison of system types. It is our engineering team's belief that VRF warrants an exemption based upon superior energy performance without economizers complicating the design.	<p>Staff notes that the prescriptive requirement in 140.4(e) are broadly applicable to air handlers and chilled water systems, irrespective of their use of VRF components - the materials in the documents relied upon show that this requirement can be complied with using cost effective equipment. To the extent that a designer would prefer to forego economizing on a system that includes VRF components, the performance compliance approach is available to accommodate these designs via an overall assessment of energy efficiency.</p> <p>The commenter asserts that fan energy use increases will be greater than compressor energy decreases for VRF systems, but does not provide any data supporting the assertion. Staff therefore finds that economizing is reasonably expected to be cost effective and energy saving for the majority of HVAC system designs, consistent with the intent of a prescriptive compliance option, and that situations for which economizing would not be preferred by the designer are accounted for via the performance option. Staff does not find that adding an exception for this equipment would be appropriate given the absence of related data in the rulemaking record - the commenter is invited to submit a complete code change proposal that includes this data in order for their proposed change to be considered in the next regular rulemaking proceeding.</p>	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?Ho=238230
238230.007	Doug Tucker and Bruce Severance (Mitsubishi Electric)	The Code Should Allow for VRF plus Decoupled DOAS System Configurations. This new requirement also provides an exception for VRF systems to allow decoupled DOAS systems (including ERVs & HRVs) instead of economizers in order to "prevent unintended impacts on the growing variable refrigerant flow (VRF) market segment and other large indoor units". However, the new economizer requirement and the exclusion of a "coupled DOAS" configuration from the exception, are very likely to have unintended impacts on the VRF market due to inherently higher cost without notable efficiency advantages. Both coupled and decoupled DOAS configurations should be allowed under the exception.	Staff notes that VRF with coupled Dedicated Outdoor Air System (DOAS) configurations have an exception if fans meet an efficiency metric. There is also the economizer tradeoff table and performance pathway for compliance. While staff has amended the language in this section for clarity, staff does not find that there is sufficient data in the rulemaking record for consideration of the additional modification requested by the commenter.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?Ho=238230
238230.008	Doug Tucker and Bruce Severance (Mitsubishi Electric)	The Code Should Allow for VRF plus Decoupled DOAS System Configurations. The Energy Code should include specific definitions for coupled and decoupled DOAS systems with explicit reference to which zones and install conditions ERVs or other DOAS are required to have a bypass duct. We would argue that bypass ducts and economizer functionality combined with VRF systems will yield marginal energy savings if any, and that if all VRF system operating modes and efficiencies are modeled, there is no clear justification for requiring either decoupled DOAS or economizer functionality given the additional system complexity and cost.	Staff finds that the rulemaking record does not contain data that would serve as the basis for differing requirements for coupled versus decoupled configurations in the manner suggested by the commenter. Staff would invite the commenter to submit a complete code change proposal with draft definitions and supporting data for the next triennial code cycle.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?Ho=238230
238230.009	Doug Tucker and Bruce Severance (Mitsubishi Electric)	VRF with Heat Recovery Should be Given Greater Compliance Credit. The exceptions that are built into a lower economizer requirement on central systems should recognize the inherent superior efficiencies achieved by VRF zone control especially when they include heat recovery systems.	Staff welcomes analysis to support heat recovery energy savings, but was not provided any analysis or data that would serve to support inclusion of an exception for these added features. Therefore, no change was made in response to this comment.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?Ho=238230

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238230.01	Doug Tucker and Bruce Severance (Mitsubishi Electric)	VRF with Heat Recovery Should be Given Greater Compliance Credit. Although Table 140.4-D (below) offers some economizer exemptions for the improved efficiency of any system with 30% to 70% higher IEER (or COP), it doesn't specifically acknowledge the additional efficiency of VRF with heat recovery estimated to add an additional 20% to 30% system efficiency depending upon climate zone and load conditions.	Staff acknowledges this comment, but this proposal was not part of the scope for this rulemaking, so no change was made in response to this comment. However, Staff welcomes stakeholders to provide a code change proposal and analysis to support heat recovery energy savings for the economizer trade-off table in the future.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.011	Doug Tucker and Bruce Severance (Mitsubishi Electric)	VRF with Heat Recovery Should be Given Greater Compliance Credit. These (VRF) system efficiencies tend to be highest when loads are moderate, and not on very hot or cold days when all zones are more likely to call for heating or cooling rather than a mix. Notably, these are similar or overlapping conditions for when economizers may be operating, and it is unlikely that the efficiencies are cumulative. That is why it is so important to recognize VRF heat recovery in the requirements, otherwise the overlay of requirements create conditions wherein the overlay of system features cancels the measurable efficiency in the field. It does not appear that the modeling that was performed for the CASE Report has factored in the cross canceling of these variables.	Staff acknowledges this comment, but this proposal was not part of the scope for this rulemaking, so no change was made in response to this comment. However, Staff welcomes stakeholders to provide a code change proposal and analysis to support heat recovery energy savings for the economizer trade-off table in the future.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.012	Doug Tucker and Bruce Severance (Mitsubishi Electric)	VRF with Heat Recovery Should be Given Greater Compliance Credit. Furthermore, economizers or DOAS systems are not designed to optimize delivery for many zones simultaneously calling for heating and cooling as is often the case in larger structures with a great deal of glazing and high interior temperature differentials. An overlay of economizer requirements or DOAS may in fact lower the overall operational efficiency of a VRF system under such conditions.	Staff acknowledges this comment, but this proposal was not part of the scope for this rulemaking, so no change was made in response to this comment. However, Staff welcomes stakeholders to provide a code change proposal and analysis to support heat recovery energy savings for the economizer trade-off table in the future.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.013	Doug Tucker and Bruce Severance (Mitsubishi Electric)	VRF with Heat Recovery Should be Given Greater Compliance Credit. We had previously suggested that a graduated phase in of the economizer-DOAS requirements over a period of years may allow industry to develop design solutions. However, it is also not clear that a compromise phase-in of a new VRF plus economizer or DOAS requirements over time would actually yield the engineered solutions to this design challenge. The additional time it would afford to design solutions that would produce more cumulative efficiencies in a cost-effective manner may not result in marketable solutions. Anything other than an economizer exception for VRF under 54kbtu threatens to kill a critical, innovative solution that already incorporates greater product advantages and efficiencies than the code seems to recognize.	Staff acknowledges this comment, but this proposal was not part of the scope for this rulemaking, so no change was made in response to this comment. However, Staff welcomes stakeholders to provide a code change proposal and analysis to support heat recovery energy savings for the economizer trade-off table in the future. The primary pathway for this proposal is for a RTU. VRF and other equipment are able to utilize the economizer trade off table or comply via the performance pathway.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230

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238230.014	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Non-Continuous Fan Operation of Coupled and Decoupled ERV or DOAS Systems. We agree with and appreciate the inclusion of the exception that to 140.4(p)3 that allows fans to continuously operate at .12W/cfm at deadband temperatures to assist in destratification and mixing. If this is allowed, all the more reason to also allow coupled DOAS configurations. There is little energy benefit to forcing the fans to off while a decoupled system continues to run, as compared to coupling VRF with an ERV, and setting the lowest fan coil fan speed to run above minimum ventilation requirements. (Note: This assertion is supported by fan affinity laws where power input is proportional to the cube of shaft speed.)	The CASE analysis had not found coupled DOAS to be energy efficient. Staff welcomes stakeholders to provide analysis and a code change proposal to include these configurations for future code updates.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.015	Doug Tucker and Bruce Severance (Mitsubishi Electric)	DOAS Air Supply Location. Mitsubishi recommends that a coupled DOAS deliver air upstream of the terminal unit fan coil as this provides for a more controlled and comfortable environment with better mixing. Please explain the technical reason and justification for (the Section 140.4(p)4 requirement.	The CASE analysis had not found coupled DOAS to be energy efficient. Staff welcomes stakeholders to provide analysis and a code change proposal to include these configurations for future code updates.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.016	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prescriptive Requirements for Space Conditioning Systems by Climate Zone. For office, library and financial buildings, the requirement for systems under 65kbtu has been changed from a furnace plus AC to allow also a dual fuel system (although the word "or" appears to be missing and clarification is needed). Given the state's decarbonization mandates, we feel that this compromise does not go far enough. Dual-fuel HP systems should be required and conventional furnaces plus AC should not be allowed.	The rationale for the heat pump (HP) baseline is set forth in the report "Heat Pump Baseline for Non-residential and High-Rise Residential Buildings" TN 238849. The goal for this rulemaking is to set either heat pump water heater (HPWH) or HP space heater as the baseline performance standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.017	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prescriptive Requirements for Space Conditioning Systems by Climate Zone. Although we have submitted comments requesting that you include cold-climate heat pumps as an option for such applications and this has not been considered, it is our hope that you would include them for such applications in this code cycle.	Staff determined that the regulations allow for installation of cold climate heat pumps: staff notes that cold climate heat pumps are available in the market and have previously considered similar comments. Such heat pumps may be used under the performance compliance method, and staff encourages their use where appropriate as an efficient option.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.018	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prescriptive Requirements for Space Conditioning Systems by Climate Zone. It is important to note that many manufacturers that produce furnace plus AC systems also have dual fuel heat pump products and such technology is well established and within the capabilities of the market. There is no reason to settle for non-optimized solutions in this category.	See responses to item 16 (238230.016)	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.019	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prescriptive Requirements for Space Conditioning Systems by Climate Zone. Whereas the 45-day language for Section 140.4 (a) 2E-F has been revised to allow dual-fuel heat pumps, Section 140.4 (a) 2B continues to impose a seemingly arbitrary furnace plus AC requirement and doesn't allow dual-fuel HPs for grocery stores in climate zone 1 and 16. At very least, the same compromise that was made in Section 140.4 (a) 2E-F should be applied to grocery stores.	The rationale for the heat pump baseline is laid out in the report "Heat Pump Baseline for Non-residential and High-Rise Residential Buildings" TN 238849. The goal for this rulemaking is to set either HPWH or HP space heater as the baseline performance standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230

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238230.02	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prescriptive Requirements for Space Conditioning Systems by Climate Zone. We continue to recommend adding language specifically allowing cold-climate HPs to comply using the performance method in climate zones 1 and 16 across all commercial applications either above or below the 65kbtu capacity threshold. Any climate that sees temperatures below -20 F. should have dual fuel systems with cold climate compressors, so the temperature at which the furnace is set to go on can be adjusted to 10 F.	Cold-climate heat pumps can be used under the performance standard under the proposed language. No additional language or changes are needed.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.021	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Partial Electric Baselines as Applied to Specific Climate Zones. We are deeply appreciative that Section 150.1(c)7, sets partial electric baselines with compliance credit (EDR) to highly motivate the specification of either a heat pump hot water heater (HPWH) or an air-source heat pump for HVAC applications.	Staff appreciate the support	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.022	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Partial Electric Baselines as Applied to Specific Climate Zones. our team doesn't understand the logic of the climate zones that have been chosen for single family dwellings. It appears that the CEC has set a very low bar for how well they expect the ASHP systems to perform. Section 150.1 (c)7 currently calls for HP space heating (ASHPs) in climate zones 3, 4, 10, 13 and 14. These climate zones were chosen based on cost effectiveness of the systems, but wholesale gas versus ASHP equipment costs posted to the docket by NRDC indicate that ASHP equipment is 15% to 30% cheaper than similar central furnace plus AC systems of the same brand and efficiency. This fact alone would dictate that ASHPs should be required in all jurisdictions that now require ultra-low NOx furnaces and where AC is generally installed in new homes (30% more expensive than ASHPs) which includes the San Joaquin AQMD and SCAQMD jurisdictions (CZs 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15. However, ASHPs are far more effective in cold climates than many commonly acknowledge, and they are well suited and economical for all climates.	The rationale for the heat pump baseline is laid out in the staff report "Residential Electric Baseline" TN 238850. The goal for this rulemaking is to set either HPWH or HP space heater as the performance baseline for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. Staff acknowledge that cold climate heat pump are available. They can be used under the performance compliance method	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.023	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Partial Electric Baselines as Applied to Specific Climate Zones. Therefore we recommend that central ASHPs be encouraged in climate zones 3,4,5,6,7,8,9,10,12,13,14,15 and that dual fuel ASHPs be required in climate zones 1, 2, 11 and 16. However, we also specifically request that the CEC add language allowing the use of cold-climate heat pump systems in these more extreme climate zones under the performance method. The technology is capable of providing heat efficiently down to -15F. Cold-climate heat pumps are even more cost effective when the cost of gas-line connection can be eliminated.	Staff acknowledge that cold climate heat pump are available. They can be used under the performance compliance method	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.024	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prohibit Integrated HPWH Units in Indoor Closets Due to Comfort and Efficiency Impacts. Although some advocates hold that this type of install (integrated HPWH units located in 3' x 4' sized closets inside the house with a simple louver door on the closet) is acceptable, we strongly recommend that the code be modified to prohibit this type of indoor installation of a compressor because it is both a comfort and efficiency compromise unless the compressor units are ducted to the outside.	Staff acknowledge that there are potential issues with locating HPWH in interior spaces, however the air inlet and outlet for these HPWH can be ducted and will mitigate all the performance issues raised by the commenter. The performance software also accounts for the interactive effect the HPWH has with the interior spaces. Furthermore this type of installation is rare, most newly constructed single family homes in California have water heaters in the garage.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230

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238230.025	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prohibit Integrated HPWH Units in Indoor Closets Due to Comfort and Efficiency Impacts. A system configured with an indoor compressor that extracts heat from conditions space will cause severe uneven temperatures in the interior and excessive dehumidification which can cause discomfort and eye irritation. Actively cooling the interior of a home during cold weather by locating an HPWH in a closet is simply a poor application of the technology and is extremely difficult to address after the fact with a different system integration solution.	See response to item 24	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.026	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prohibit Integrated HPWH Units in Indoor Closets Due to Comfort and Efficiency Impacts. With the introduction of more flammable low-GWP refrigerants in the coming years, there will also be restrictions on containment of the unit in a tight indoor closet. The code should anticipate such future requirements and restrict this application in the meantime.	See response to item 24	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.027	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prohibit Integrated HPWH Units in Indoor Closets Due to Comfort and Efficiency Impacts. Sound levels are also an issue. Section 150.0 (o) 1Gvi references an ASHRAE standard for no more than 3 zones for exhaust fans (ASHRAE Section 7.2.2). Why then is it acceptable to have a compressor in the living space that is many times as loud (up to 40 decibels)?	See response to item 24	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.028	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Prohibit Integrated HPWH Units in Indoor Closets Due to Comfort and Efficiency Impacts. At very least, the CEC should conduct field testing on interior HPWH compressor impact on interior temperature balance and obtain consumer feedback before allowing or encouraging interior compressors. Allowing interior compressors in advance of such consumer feedback poses a high risk of stranded assets and consumer opposition to electrification as a whole. It is very difficult to retrofit buildings with central water heating after the fact, and there are no products on the market that allow a retrofit alternative to interior HPWH compressor configurations should residents be unhappy with the poor temperature control and noise levels this option imposes. This appears to be an obvious problem, and it should be prohibited in this code cycle pending further research	See response to item 24	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.029	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Mitsubishi Electric is very concerned that rushing to implement economizer requirements on all VRF indoor units under 54kbtu fails to recognize the efficiencies and advantages of VRF systems in their various configurations. Economizer requirements should be limited to packaged systems for which economizers are designed, and it is inherently disadvantageous to overlay this requirement onto VRF multi-split systems. An overlay of additional stringent requirements puts these inherently more efficient systems at an even greater cost disadvantage. These rules should be applied carefully and with consideration.	Staff does not find that uniform application of an existing requirement would create an inherent disadvantage based solely on applying the requirement to a smaller category of system design. To the extent that some VRF systems can achieve performance levels on par with prescriptive systems without incorporating economizing, said systems would be able to take advantage of performance-based compliance. Staff does not find that lowering the stringency of the proposed requirements to be necessary to address this circumstance.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230

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238230.03	Doug Tucker and Bruce Severance (Mitsubishi Electric)	We specifically ask for an economizer exemption on equipment below 54kbtu to remain and not to impose this requirement on indoor equipment down to the 33kbtu economizer threshold. There are few existing ERV or DOAS systems with the economizer functionality and bypass required to meet the 140.4(p)1B requirements.	Staff finds that the reduced threshold is justified based on the data and information in the documents relied upon for the rulemaking. It is not clear from commenter's statements the reason why ERV or DOAS systems cannot be designed to incorporate economizing and bypass consistent with 140.4(p)1B, given that some systems already do - to the extent that some systems would not be able to meet this specification by its effective date, the performance compliance approach allows for such designs to comply with the Energy Code on a performance basis.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238230.031	Doug Tucker and Bruce Severance (Mitsubishi Electric)	Proceeding with the 33kbtu requirement as the CEC appears to be doing will very likely reduce the installation and use of these inherently more efficient VRF products in the state, contrary to the intent of this new version of Title 24, Part 6.	Staff finds that the flexibility provided by the performance approach and the available options for prescriptive compliance make it unlikely that installation of VRF equipment will be significantly reduced as a result of the noted requirement.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238230
238231.001	California Building Industry Association	Without question, CBIA would have preferred the CEC refrain from changing the prescriptive measures to begin a transition to electric space and water heating during this update of the standards and instead, promote increased market penetration of this technology via financial and regulatory incentives. For example, the market penetration of heat pump water heaters in new residential construction is currently 2%. Using the CEC's solar mandate as an example, the industry would have preferred to work with the CEC and stakeholders to see that market penetration increase to 25%-30% before a change was made to the prescriptive measures.	Staff appreciates the comment	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.002	California Building Industry Association	CBIA understands significant pressure has been placed on the CEC during the past six months to move forward with an all-electric mandate now. While we would question whether the CEC has the legal authority to mandate allelectric construction, CBIA does recognize the CEC is taking a significant step towards decarbonizing new residential construction by requiring the compliance budget of the dwelling to be calculated using either electric space or water heating technology. While a builder can still choose to install gas space and water heating, the CEC will require substantial efficiency measures to offset the carbon associated with continued gas use for both of those appliances.	Staff appreciates the comment	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.003	California Building Industry Association	CBIA strongly supports the CEC's proposed compliance credit for those builders who choose to install heat pump technology for both space and water heating.	Staff appreciates the comment of support.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.004	California Building Industry Association	CBIA is working with other stakeholders to support financial incentives to help reduce the up-front cost of decarbonization and energy storage technology. The combination of these efforts will serve to increase the market penetration of these technologies in new construction.	Staff appreciate the comment	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231

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238231.005	California Building Industry Association	While CBIA supports the "opt-out" language being added in 10-115(a)(4), we strongly oppose the proposed addition of a new mandate for the builder to offer as a design option the installation of rooftop solar for those projects planning to use the community solar (CS) compliance option. If the homebuyer (of a home receiving CS) wants rooftop PV, proposed amendments to 10-115(a)(4) will allow for rooftop PV installation as soon as they take possession of the home or at some later point down the road. Homeowners should have the ability to modify their homes after purchase, providing they still meet the code in effect when the house was initially built.	Thank you for the comment of support	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.006	California Building Industry Association	The language proposed in 10-115(a)(8) is unprecedented for a state building code and will be largely unworkable in the field for the following reason: Depending on the market, the home may be completed and energized before there is a buyer. This raises the question: at what point in time does the builder no longer have to offer rooftop PV?	Staff agrees and the adopted language reflects this change. (Staff deleted the Original Building Purchaser Choice provision).	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.007	California Building Industry Association	The language proposed in 10-115(a)(8) is unprecedented for a state building code and will be largely unworkable in the field for the following reason: What happens to the cost of the rooftop PV system when it becomes a mandated "design option" for the builder who would prefer to use CS? A last-minute change from the standard design will always come at a higher cost, and this will undoubtedly be the case for rooftop solar as the builder will need to deal with the last-minute logistics of arranging for the purchase, installation, and interconnection of a single rooftop solar system in a project where other homes are receiving renewable energy from a community solar resource.	Staff agrees and the adopted language reflects this change. (Staff deleted the Original Building Purchaser Choice provision).	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.008	California Building Industry Association	The language proposed in 10-115(a)(8) is unprecedented for a state building code and will be largely unworkable in the field for the following reason: The Public Utilities Commission is conducting a proceeding to update the Net-Energy-Metering rates for Investor Owned Utilities. It is highly likely that some level of reduction in the economic benefits attributed to rooftop solar will be adopted and apply to newly constructed homes with solar. A home receiving community solar bypasses this source of future economic uncertainty. Also, a home receiving community solar will not need to absorb the up-front additional cost associated with a rooftop solar system. This can be very attractive to a potential homebuyer who is struggling to qualify for a new home.	Staff agrees and the adopted language reflects this change. (Staff deleted the Original Building Purchaser Choice provision).	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231

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238231.009	California Building Industry Association	The language proposed in 10-115(a)(8) is unprecedented for a state building code and will be largely unworkable in the field for the following reason: Regarding the small or medium size CS provider, which may or may not be a utility, this proposal will hurt the economic viability of the proposed CS system if there is a level of uncertainty regarding whether the community solar resource will receive the level of use intended. With that level of uncertainty, why would someone want to take the financial risk of becoming a CS provider or someone who would fund CS projects? In contrast, the larger, utility-scale CS provider can weather this proposed change to the administrative regulations, which probably is not the intent of the CEC.	Staff agrees and the adopted language reflects this change. (Staff deleted the Original Building Purchaser Choice provision).	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.01	California Building Industry Association	The language proposed in 10-115(a)(8) is unprecedented for a state building code and will be largely unworkable in the field for the following reason: It creates a system that favors rooftop solar over CS as the same regulation does not require a builder who plans to install rooftop PV to offer CS to the buyer.	Staff agrees and the adopted language reflects this change. (Staff deleted the Original Building Purchaser Choice provision).	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.011	California Building Industry Association	Lastly, as we have already seen in the Sacramento region, where CS is readily available as a compliance option, the lion's share of builders is still going with rooftop solar. The concerns we heard 14 months ago that CS was going to kill rooftop solar in the SMUD region never materialized.	Thank you for the comment	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.012	California Building Industry Association	The amendments proposed by the CEC in the language reprinted above will further reduce the options for installing ducts in conditioned space by effectively banning the use of uninsulated ducts in conditioned space. The language above would only allow uninsulated ducts in fully exposed locations, which is not a realistic design option for aesthetic reasons. Also, don't insulation requirements need to be cost-effective?	After discussion with stakeholders, staff has revised the language in Section 150.0(m)1Bii to accommodate uninsulated ducts in conditioned space.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.013	California Building Industry Association	The realistic option for uninsulated ductwork is to run it in cavities within the building's thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. However, once the ducts are located within the building's thermal envelope, we would question the need for any level of required duct insulation. After all, what's the point of requiring duct insulation when the duct is already within the building's thermal envelope?	See comment above, TN#238231.012	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.014	California Building Industry Association	Regarding condensation concerns, we have heard from builder members who construct homes in states with higher humidity levels than those found in California, and they have not encountered condensation problems. Based on this experience, we are confident that uninsulated ducts can be used in California without issue.	See comment above, TN#238231.012	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238231.015	California Building Industry Association	CBIA would respectfully request the language in the Express Terms be amended to allow for the unrestricted use of uninsulated ducts in the building's conditioned space. This can be achieved by amending Section 150.0(m)1B. [proposed language pdf page 5]	Staff appreciates the comment. The Commission adopted language reflecting this suggestion.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231

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238231.016	California Building Industry Association	The Asphalt Roofing Manufacturing Association (ARMA) has submitted comments to the CEC voicing concern over a possible conflict in the proposed amendments (See Docket 19-BSTD-03, TN 236877 and TN 237717). CBIA would respectfully request the CEC investigate this concern and determine if a change should be made to the standards or if an explanation in the Energy Conservation Manual would suffice in addressing any potential conflict.	See comments above, TN #237846.001	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238231
238232.001	David Wilds Patton (David Wilds Patton Lighting Design)	150.0(k)1B I am convinced that this section ((k)1B) should be left out. It is self-referential to Table 150.0-A. I would caution staff to not duplicate information in more than one section or Table. Simple is better and duplicating the same thing in multiple places is confusing and introduces the opportunity for conflicting information. I would caution against this practice. It's simply unnecessary.	Staff appreciates the comment about Section 150.0(k)1B - about screw based luminaires. Section 150.0(k)1B is reverted to the 2019 language.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238232
238232.002	David Wilds Patton (David Wilds Patton Lighting Design)	150.0(k)1Ci I am confused about the deletion of the requirement here (in section (k)1Ci) for IC rated luminaires. I didn't find that requirement anywhere if this is actually struck out. Although an Airtite requirement is still in the code, without this section, IC would not be required. There is an exception at the end of this section regarding recessed luminaires for fire-rated and non-IC rated luminaires, so I believe we need to keep the struck-out part above.	Staff removed reference to IC rating for harmonization with a newly added reference to California Electrical Code Section 410.116. Installation requirements for IC-rated luminaires are now present in this section of the California Electrical Code (2022), as part of a comprehensive set of requirements addressing clearance and installation for and about recessed luminaires.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238232
238232.003	David Wilds Patton (David Wilds Patton Lighting Design)	150.0(k)1Civ I believe that since this requirement (in section (k)1Civ) has nothing to do with energy efficiency, that it should not be added to the Standards. If it is still determined critical, for whatever reason, you should also refer to the National Electrical Code Section 410.16 for clothes closets. I would phrase it like this: "Meet the clearance and installation requirements of the clothes closet sections of the National Electric Code Section 410.16 and the California Electrical Code Section 410.116." Adding the words clothes closets at least lets the reader know what we are referencing. I had to Google that section to find out what this requirement was about.	Staff determined that pointers to requirements present in other portions of the Building Standards Code that are applicable to a system or unit of equipment are useful to readers and implementers of these codes, noting that the public comments for the addition of similar pointers in Parts 2 through 5 as a part of a separate, parallel rulemaking garnered significant positive commentary. Staff therefore determined that inclusion of such pointers is appropriate and likely to increase compliance and decrease confusion. Separately, staff does not believe that adding qualifiers to this pointer to the Electrical Code (i.e., clothes closet) is appropriate given that the intent is to identify without unnecessary commentary the related Electrical Code provisions.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238232

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238233.001	Codes and Standards Enhancement	Based on our review of the energy models presented in the Integrated Pumped Refrigerant Economizer for Computer Rooms Building Energy Efficiency Measure Proposal, it appears that a full-load cooling COP of 3.92 was used in the energy analysis to demonstrate equivalent energy performance of a pumped refrigerant economizer CRAC to a water-cooled chiller plant with water economizing using evaporative cooling towers, with a baseline chiller COP of 5.17. The model includes 10 CRACs operating in parallel for a total cooling capacity of 4,560,479 Btu/hr (or about 456,000 Btu/hr per CRAC). The ASHRAE 90.1-2019 minimum efficiency for this size CRAC is 2.36 COP (including supply fans), which is expected to be adopted by the U.S. Department of Energy later this year. After subtracting out a 140.9(a)2 correlation for fan energy using Equation 3, this equates to a cooling COP of 3.01, which is significantly lower than the value of 3.92 used.	Based on feedback from stakeholders, including these comments, the Energy Commission declined to adopt the proposed pumped refrigerant economizer standards this standards cycle.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238233
238233.002	Codes and Standards Enhancement	Because a pumped refrigerant economizer requires a COP better than code minimum to be energy equivalent to 2019 Title 24, Part 6 Section 140.9(a)1 equipment, the Statewide CASE Team urges the Energy Commission to include language in section 140.9(a)1C that establishes a minimum equipment efficiency requirement for pumped refrigerant economizers.	Based on feedback from stakeholders, including these comments, the Energy Commission declined to adopt the proposed pumped refrigerant economizer standards this standards cycle.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238233
238233.003	Codes and Standards Enhancement	A minimum full-load cooling COP was calculated for each climate zone in order for the proposed pumped refrigerant economizer cooling energy to be equal to the energy use for a code-baseline water-cooled chiller plant with water economizing using evaporative cooling towers (chiller cooling + pumps + cooling tower energy). To compare energy, chiller cooling, pumps, and heat rejection fans in the baseline case are compared to CRAC compressor, pump, and heat rejection fan energy in the refrigerant economizer case. A pumped refrigerant economizer with a minimum cooling COP of 4.0 and with full economizing at 50°F outdoor dry-bulb provides equivalent energy use to a water-cooled chiller and water economizer system under 2019 Title 24, Part 6 economizer thresholds for all climate zones, when comparing annual TDV kBtu energy use. A cooling COP of 4.0 equates to a total CRAC net sensible COP of 2.9 when including 140.9(a)2 minimally compliant supply fan energy. [Table 1 PDF page 8]	Based on feedback from stakeholders, including these comments, the Energy Commission declined to adopt the proposed pumped refrigerant economizer standards this standards cycle.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238233
238233.004	Codes and Standards Enhancement	A minimum full-load COP was calculated for each climate zone in order for the proposed pumped refrigerant economizer cooling energy to be equal to the 2022 45-Day Language energy use for a code-baseline water-cooled chiller plant with water economizing using evaporative cooling towers (chiller cooling + pumps + cooling tower energy). A pumped refrigerant economizer with a minimum cooling COP of 11.0 and with full economizing at 50°F outdoor dry-bulb provides equivalent energy use to a water-cooled chiller and water economizer system under 2022 Title 24, Part 6 economizer thresholds for all climate zones, when comparing annual TDV kBtu energy use. A cooling COP of 11.0 equates to a total CRAC net sensible COP of 5.5. [Table 2 PDF page 10]	Based on feedback from stakeholders, including these comments, the Energy Commission declined to adopt the proposed pumped refrigerant economizer standards this standards cycle.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238233

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238233.005	Codes and Standards Enhancement	PDF page 10 contains proposed language.	Based on feedback from stakeholders, including these comments, the Energy Commission declined to adopt the proposed pumped refrigerant economizer standards this standards cycle.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238233
238233.006	Codes and Standards Enhancement	Additional analysis was performed to determine the minimum CRAC cooling COP and NSensCOP required for a pumped refrigerant economizer with different full economizing outdoor temperatures to have equivalent annual TDV energy consumption as a 2022 baseline water-cooled chiller with evaporative cooling tower system. We started at 50°F to match 2022 45-day language (presented in section 5) and ran iterations at 5°F increments to show the different impact on minimum COPs required for equivalent energy use. [See Tables 3-5 PDF pages 12-13]	Based on feedback from stakeholders, including these comments, the Energy Commission declined to adopt the proposed pumped refrigerant economizer standards this standards cycle.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238233
238237.001	Shelah Ott	We are in a climate emergency, and yet the CEC is taking an incremental approach to building electrification. The indoor air pollution produced from gas stoves is hazardous to our health, and is associated with increased asthma, cardiovascular disease and other health risks, especially in children. Waiting three more years for the 2025 update would cost Californians \$1 billion in unnecessary gas infrastructure, and lock them into 3 million tons additional carbon emissions by 2030. Electric appliances are readily available to meet the needs of all-electric buildings and all-electric new construction should be required in the 2022 Energy Code Update. Thank you.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238237
238239.001	Jim Moore (Beazer Homes)	we are trerore disappointed to see that the Express Terms include language that would reduce our options for conditioned air distribution by effectively banning the use of uninsulated ducts in conditioned space. Section 150.0(m)1B, covering duct insulation requirements, would only allow uninsulated ducts in fully exposed locations, which is not a realistic option for obvious aesthetic reasons. The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome. There is no requirement for insulation on ducts in conditioned space in either the IRC or the IECC, and no US state requires ducts in conditioned space to be insulated. As a national builder, the need to change designs for the California market will impact our overall costs and our ability to deliver efficient houses to California customers. While we understand the Commissions caution regarding potential condensation issues, uninsulated metal ducts have been used in the Midwest for decades. Many Midwest States experience higher humidity levels than California and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue. We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/16/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238239

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238257.001	Frank Morrison	The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome.	CEC Staff agrees with commenter and have included test procedure for dry coolers in section 110.2.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238257
238258.001	David Cunningham (Taylor Morrison)	we are tnerore disappointed to see that the express terms include language that would reduce our options for conditioned air distribution by effectively banning the use of uninsulated ducts in conditioned space. Section 150.0(m)1B, covering duct insulation requirements, would only allow uninsulated ducts in fully exposed locations, which is not a realistic option for obvious aesthetic reasons. The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome. There is no requirement for insulation on ducts in conditioned space in either the IRC or the IECC, and no US state requires ducts in conditioned space to be insulated. As a national builder, the need to change designs for the California market will impact our overall costs and our ability to deliver efficient houses to California customers. While we understand the Commissions caution regarding potential condensation issues, uninsulated metal ducts have been used in the Midwest for decades. Many Midwest States experience higher humidity levels than California and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue. We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238258
238259.001	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	While we understand the Commissions caution regarding potential condensation issues, uninsulated metal ducts have been used in the Midwest for decades. Many Midwest States experience higher humidity levels than California and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue.	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238259
238259.002	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be amended to allow the unrestricted use of uninsulated ducts in the building's conditioned space. This can be simply achieved by amending Section 150.0(m)1B to read: "Portions of supply-air and return-air ducts and plenums of a space heating or cooling system outside of the buildings conditioned space shall be insulated to a minimum installed level of R-6.0"	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238259
238259.003	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	Modifying and/or Limiting Exceptions: Like the R-value changes, this change will also bring California more in line with national standards where exceptions are more limited. Having fewer, well defined exceptions will also help improve compliance. The number and relative complexity of the exceptions under the 2019 Standards make it very difficult, if not impossible, to monitor or enforce these requirements.	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238259

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238259.004	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	Roof Recover Requirement: This is an effective and technically sound policy for accelerating the needed improvement in envelope efficiency across a larger universe of buildings. The option to recover an existing roof is an attractive and comparatively less expensive option to a full roof replacement in part because recovers do not currently have any requirements under the California's Standards or the national model energy codes to increase building energy efficiency (i.e., typical roof recovers maintain the status quo in terms of energy usage). This proposal would help create parity between the two reroofing options of recover or replacement, and ensure both reroofing practices contribute toward improved energy efficiency.	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238259
238259.005	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	Exception Backstop: The one major exception retained under the proposed 2022 Standards is for base flashing that is limited by the presence of equipment when that equipment is not going to otherwise be moved or lifted during the project. The retained exception would also be modified with a "backstop" that requires some insulation to be installed even if the flashing heights and roof-top equipment prevent the full R-17 or R-23 from being installed. Requiring a backstop like this prevents abuse of the exception and is another change under the CEC's proposal that will ultimately lead to better compliance.	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238259
238259.006	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	Above-Deck Continuous Insulation: The addition of above-deck roof insulation will help mitigate condensation issues that can occur in existing buildings where original roof membranes are replaced with reflective (i.e., "cool") roofs. The wood-deck, single-rafter roof assemblies common in California that contain below deck insulation that has been damaged, displaced or otherwise deteriorated over time are particularly prone to condensation problems. Similarly, other assembly types, such as steel decks, are adversely affected by condensation. Condensation in the roof assembly affects not only the structural safety of the assembly (e.g., rust, rot), but it also impacts energy use by weakening the thermal value of the insulation that was installed below the deck and that comes into contact with the condensation. Adding continuous insulation above the roof deck when work is already underway to replace (or recover) the roof system is very cost effective and will help preserve the roof's thermal performance for a longer time period. Because of the difficulty in verifying the amount and condition of insulation below deck, this requirement will also lead to improved compliance.	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238259
238259.007	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	Roof Area Affected Threshold for Multifamily Buildings: It appears that the intent of section 180.2(b)1Bii is to require minimum insulation for low-slope roof replacements or recovers where the affected roof area is greater than 50 percent of the roof or 2,000 square feet, whichever is less. This minimum-area-affected stipulation is the same for roof alterations in nonresidential buildings, under proposed section 141.0(b)2B (and is the same threshold used in prior versions of the Standard). [suggested language PDF page 5]	Staff removed the redundant language in order to allow the preceding language in section 180.2(b)1A to be controlling, consistent with the commenter's comment.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238259

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238259.008	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	Although we believe that many of the CEC's proposed changes will indirectly address the noncompliance issue, PIMA urges the CEC to consider improvements to the mechanisms for compliance and enforcement during the next code update cycle (i.e., for the 2025 Standard).	Staff are committed to further improving compliance and enforcement both in the context of future rulemaking actions and regular interactions with local enforcement agencies.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238259
238259.009	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	The current compliance process relies on a contractor properly filling out and submitting Form NRCC-ENV-E, which covers all of the envelope requirements for new construction, additions, and alterations. The form is difficult to understand and use, which may contribute to its ineffectiveness and the reported level of noncompliance within California.	Staff will be working with Outreach & Education, Standards Compliance Office, as well as Energy Code Ace to provide training prior to implementation of the 2022 Standards on January 1, 2023. Staff will also look at revisions to the forms themselves to enhance clarity.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238259
238259.01	Justin Koscher (Polyisocyanurate Insulation Manufacturer's Association)	Plan reviews and/or inspections related to roof alterations are extremely rare. As a result, there is no verification of the roof R-values or the exceptions that may be claimed to avoid the R-value requirements, which creates an uneven playing field for the marketplace.	Staff are committed to further improving compliance and enforcement both in the context of future rulemaking actions and regular interactions with local enforcement agencies.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238259
238260.001	Hammond Climate Solutions	We are in a climate emergency and we need bold action to mandate building electrification. We need to move towards 100% electric buildings in order to meet our climate goals. Continuing to use gas appliances not only means increased emissions but it also means increase health emergencies, as gas stoves are associated with increased asthma, cardiovascular disease and other health risks. If we do not act boldly now, we will continue to need to rely on harmful fossil fuels, and additional and unnecessary gas infrastructure will continue to be built, costing California upwards of \$1 billion. Please, do more than just encourage electric buildings for new construction and make them a requirement, to secure a safe and livable future for our children.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238260
238261.001	Brad Conlon (DR Horton)	we are tnerore disappoineteo to see tnat tne express terms include language that would reduce our options for conditioned air distribution by effectively banning the use of uninsulated ducts in conditioned space. Section 150.0(m)1B, covering duct insulation requirements, would only allow uninsulated ducts in fully exposed locations, which is not a realistic option for obvious aesthetic reasons. The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome. There is no requirement for insulation on ducts in conditioned space in either the IRC or the IECC, and no US state requires ducts in conditioned space to be insulated. As a national builder, the need to change designs for the California market will impact our overall costs and our ability to deliver efficient houses to California customers. While we understand the Commissions caution regarding potential condensation issues, uninsulated metal ducts have been used in the Midwest for decades. Many Midwest States experience higher humidity levels than California and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue. We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238261

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238261.002	Brad Conlon (DR Horton)	While we understand the Commissions caution regarding potential condensation issues, we have used uninsulated ducts in houses in climates with higher humidity levels than California, including NJ, MD, VI, PA, OH, IL, IN, MN, WA, OR, FL, TX, LA, AL, GA and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238261
238263.001	Chuck Chippero (Pulte Group)	we are tnerore disappointed to see that the express terms include language that would reduce our options for conditioned air distribution by effectively banning the use of uninsulated ducts in conditioned space. Section 150.0(m)1B, covering duct insulation requirements, would only allow uninsulated ducts in fully exposed locations, which is not a realistic option for obvious aesthetic reasons. The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome. There is no requirement for insulation on ducts in conditioned space in either the IRC or the IECC, and no US state requires ducts in conditioned space to be insulated. As a national builder, the need to change designs for the California market will impact our overall costs and our ability to deliver efficient houses to California customers. While we understand the Commissions caution regarding potential condensation issues, uninsulated metal ducts have been used in the Midwest for decades. Many Midwest States experience higher humidity levels than California and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue. We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238263
238264.001	Jim Mahler (AFT Guild, Local 1931)	Our labor unions commend the California Energy Commission's ("Commission" or "CEC") for being responsive to stakeholder concerns so far in the code process. We urge you to support a strong building electrification code and commit to an all-electric code in the 2022 Building Code update	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264
238264.002	Jim Mahler (AFT Guild, Local 1931)	Strong climate action is a must if California is not to be a hindrance to the Biden administration's goal of cutting greenhouse gas emissions 50% by 2030.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264
238264.003	Jim Mahler (AFT Guild, Local 1931)	Governor Gavin Newsom recognized that "across the entire spectrum, our goals are inadequate."	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264
238264.004	Jim Mahler (AFT Guild, Local 1931)	A recent analysis by Energy Innovation found that California is not on track to meet its 2030 GHG reduction requirements and recommended accelerated building electrification among the suite of policies to achieve needed additional emissions reductions. The moment to act is now.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264

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238264.005	Jim Mahler (AFT Guild, Local 1931)	Workers, women, communities of color and low-income people suffer disproportionately from environmental degradation and climate change; and climate change is already harming working families and vulnerable populations through extreme hurricanes, wildfire, drought and flooding, increased stress on the agricultural sector, health impacts like heat stroke and the spread of infectious diseases. Continuing to install fossil fuels in buildings will only worsen these issues for workers and families.	Staff appreciates the comment. The Commission is aware of and sensitive to the environmental justice concerns addressed in this comment. CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264
238264.006	Jim Mahler (AFT Guild, Local 1931)	We are encouraged by just transition policies adopted in San Francisco ^{3,4} to simultaneously ban fossil fuels in new buildings, while requiring buildings to install grey water and recycled water pipes. We encourage the California Energy Commission to work with other agencies to create a similar policy.	Thank you for the comment. CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264
238264.007	Jim Mahler (AFT Guild, Local 1931)	As Californians scramble to prepare for yet another coming fire season—this time while the State is entering another emergency drought—the number of residents living in trepidation is growing, we urge you to adopt a strong electric building code and reignite California's climate leadership.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264
238264.008	Jim Mahler (AFT Guild, Local 1931)	All-electric new construction is a low-hanging climate mitigation strategy that California should adopt now to realize the significant public health, air quality and climate benefits of all-electric buildings and allow the Commission and local governments to singularly focus its resources on equitable electrification of the existing built environment.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238264
238265.001	Rob Starr and Russell King (CHEERS and CalCERTS)	In . . . discussions the Providers learned that Commission Staff intend to add language defining "Compliance Registration Packages" to the 2022 BEES. Both Providers support this proposed definition.	The definition has been added to 10-102 in the 15-day language. This definition is also included in JA7.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238265
238265.002	Rob Starr and Russell King (CHEERS and CalCERTS)	Commission Staff also indicated that new language will be introduced at the 15-day language that will allow Commission Staff to request both compliance documents and Compliance Registration Packages, required to be maintained by the Providers. Both Providers support this proposed definition, with some limitations.	This language has been added in the 15-day language sections 10-103 and 10-109 and JA7.4.8.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238265
238265.003	Rob Starr and Russell King (CHEERS and CalCERTS)	We appreciate Commission Staff assurances that these new requirements will apply to the 2022 BEES going forward and will not be applied retroactively.	Staff appreciates the comment of support.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238265
238265.004	Rob Starr and Russell King (CHEERS and CalCERTS)	We also appreciate Commission Staff assurances that requests for compliance documents and Compliance Registration Packages will not be required to be delineated by specific searchable features, such as jurisdiction or form, as examples.	Staff appreciates the comment of support.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238265
238265.005	Rob Starr and Russell King (CHEERS and CalCERTS)	We request the Commission to add some language to the proposed 15-day language that limits Commission Staff requests to reasonable requests with respect to size and scope. For example, the HERS Regulations under Title 20 provides that the Commission may make requests from Providers "but not more frequently than annually." (See 20 CCR 1673(g).)	Staff has deleted this proposed requirement in the 15-day code.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238265

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238265.006	Rob Starr and Russell King (CHEERS and CalCERTS)	With the Commission's proposed changes to JA.7.4.8 please incorporate language that reasonably limits the requests so that the Providers can deliver the necessary documents to the Commission but also reasonably control operation costs. The regulations need to contain some protection from unreasonably large and/or cost-prohibitive data demands. [proposed language PDF page 4]	Staff has deleted this proposed requirement in the 15-day code.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238265
238267.001	John Mangano (Toll Brothers)	we are tnerore disappointed to see that the express terms include language that would reduce our options for conditioned air distribution by effectively banning the use of uninsulated ducts in conditioned space. Section 150.0(m)1B, covering duct insulation requirements, would only allow uninsulated ducts in fully exposed locations, which is not a realistic option for obvious aesthetic reasons. The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome. There is no requirement for insulation on ducts in conditioned space in either the IRC or the IECC, and no US state requires ducts in conditioned space to be insulated. As a national builder, the need to change designs for the California market will impact our overall costs and our ability to deliver efficient houses to California customers. While we understand the Commissions caution regarding potential condensation issues, uninsulated metal ducts have been used in the Midwest for decades. Many Midwest States experience higher humidity levels than California and have not had any problems related to condensation. Based on this experience, we are confident that uninsulated ducts can be used in California without issue. We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238267
238269	Charles Knuffke (Wattstopper)	If the new sections will be drawing from the previous sections, why weren't the new sections formatted so the numbering of their subsection requirements could be easily deduced based on the previous nonresidential and residential sections?	The new Multifamily sections and chapters are developed based on many of the requirements from the nonresidential sections and the single family sections - but some requirements of the nonresidential sections and the single family sections are not appropriate or applicable to multifamily buildings. In addition multifamily buildings have dwelling spaces, support and service spaces and other spaces and requirements for them, it is necessary for the Multifamily sections to be numbered based on the multifamily requirements.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.001	Charles Knuffke (Wattstopper)	our suggestion is to remove all the new multifamily language, or at the very least refer to the previous code sections instead of carrying all the previous code verbiage into the new sections so that differences in the code can be clearly called out as exceptions	Staff disagree with the comment for the following reason. Multifamily buildings have dwelling spaces, support and service spaces and other spaces and requirements for them, it is necessary for the Multifamily sections to be numbered based on the multifamily requirements - rather than based on non-multifamily code requirements.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563

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238269.002	Charles Knuffke (Wattstopper)	Example 5: Example of earlier language not being properly updated §160.5(b)4Cvi.b Despite the excessively long section number, we wanted to include this error. The requirement is in one of the new multifamily Code sections, yet the below exception refers to a section in the nonresidential portion of the code – 130.1(c)6D.	Thank you for the comment and the reference section is going to be corrected. §160.5(b)4Cvi.b is the subsection about occupant sensing controls for offices greater than 250 square feet.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.003	Charles Knuffke (Wattstopper)	Example 4: We found several difference between §150.0(k)3A and §160.5(a)3A. in the top residential language, line ii requires a photocell and a motion sensor, but in the bottom multifamily example, line ii just requires a photocell. This represents a significant difference in the required hardware, one that must have been deleted deliberately from the multifamily requirements. We do not understand why the multifamily text allows significantly less efficient hardware than the residential text requires.	Staff appreciates the comment. The reasons for Section 160.5(a)3A are as follows. Section 160.5(a)3A is about outdoor lighting mounted outside the multifamily dwelling units for dwelling unit occupants could be some balcony lighting - the quantity is minimal and the wattage could be small. The outdoor lighting for single family home buildings could be very different and could be wall-mounted outdoor luminaires, porch lighting, courtyard lighting and doorway lighting.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.004	Charles Knuffke (Wattstopper)	Example 3: Error updating multifamily language when a change is made in previous section Table 141.0-F – Control Requirements for Indoor Lighting System Alterations – 3rd column header states: Projects complying with Sections 141.0(b)2lii or 141.0(b)2liiii However, Table 180.2-D – Control Requirements for Indoor Lighting System Alterations for Common Services Areas – 3rd column header states: Projects complying with Sections 180.2(b)4Bivb and 180.2(b)4Bivc	In response to stakeholder's comment, corrected Table 180.2-E (was Table 180.2-D) and corrected a word the 3rd column header of Table 180.2-D from "and" to "or".	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.005	Charles Knuffke (Wattstopper)	Example 2: We found several difference between Section 130.2(c) 2B and Section 160.5(c)2Bii. Why does multifamily require a 50-90% reduction, but the earlier section has a 60- 90% reduction?	There is an error in the CASE document - documented in docket 19-BSTD-03 document TN234598. Both multifamily and nonresidential requirement for the outdoor lighting controls is a 50-90% outdoor lighting power reduction capability. In response to stakeholder's comment, staff corrected the reduction values in the multifamily Section 160.5(c)2Bii.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.006	Charles Knuffke (Wattstopper)	Example 1: We found several difference between Table 140.7-A and Table 170.2-R. (Example 1)	Both Table 140.7-A and Table 170.2-M are correct and the reasons for Table 170.2-M are as follows. The multifamily buildings are proposed to have a two-factor outdoor lighting allowance provisions and this have been documented in docket 19-BSTD-03 document TN234598. This has also been presented in the pre-draft Staff Workshop and the 45-Day Hearing Workshop.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563

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238269.007	Charles Knuffke (Wattstopper)	<p>§160.0: Not once in all the training presentations on Title 24 we've led has anyone suggest that what the code needed was over a hundred pages of additional text for multifamily buildings. New language came about because of no more than a few paragraphs for outdoor lighting; We question whether these small areas of code concern justify the massive addition of the new multifamily Sections.</p> <p>Most of the rest of the language is a repetition of the earlier code language. We think the multifamily code language further diverges future code cycles that designers will have a difficult time to remember the difference in the code for areas in a multifamily building vs those in a nonresidential buildings.</p>	The new multifamily chapters, including Section 160.0, were created in response to stakeholder requests for a new code specifically for multifamily buildings, in lieu of relying on combinations of both single family and nonresidential code. Staff determined that organizing the regulations to create dedicated chapters for this specific class of building both fits the intent of the original separation of residential and nonresidential provisions, and is likely to enhance usability given that users can identify applicable chapters based on the type of space being designed.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.008	Charles Knuffke (Wattstopper)	Table 150.0-A: Item #2 of Table 150.0-A could be read in two different ways. We believe this one is correct - "(Inseparable Solid State Lighting (SSL) luminaires and colored light sources) that are (installed to provide decorative, accent, display, utility, undercabinet or special effect lighting" It may need to be edited to provide clarify.	Staff appreciates the comment, and staff could see how the proposed language could read in more than one way. Item #2 has been reverted back to the 2019 language.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.009	Charles Knuffke (Wattstopper)	§150.0(k)3A: It removes the very item that ensured outdoor lights would be off during daytime hours. There's no way a standard timeclock controlling outdoor lighting – which is usually set and forgotten about – wouldn't be on during daylight hours for a good part of the year.	Staff appreciates the comment. The language of Section 150.0(k)3A has been reverted back to the 2019 language.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.01	Charles Knuffke (Wattstopper)	§150.0(k)2F: We believe the wattage threshold of 20 watts - better represents a proper balance between the cost of running individual circuits and the cost of additional dimming controls.	Staff thank the comment supporting the proposed amendment.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.011	Charles Knuffke (Wattstopper)	§140.6(a)2K: This PAF should apply to all lighting, not just General Lighting. This PAF language should also be edited in Table 140.6-A.	The demand responsive lighting controls requirements are based on reduction of general lighting power for achieving demand management, and the PAF for demand responsive control of Section 140.6(a)2K is also based on reduction of general lighting power. Based on the above, staff do not find it reasonable to make the change as suggested from the comment.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.012	Charles Knuffke (Wattstopper)	Exception 4 to §130.2(c)3: We've believed that this was being done solely to align with ASHRAE, but this makes little sense. ASHRAE's cost effectiveness is based on a single average cost of electricity that is less than what CA uses in its ROI calculations. For that reason alone, T24 should not seek to constantly align with 90.1.	There are comments with different takes about the added Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C. Since no comprehensive data set is available about the subject other than dated studies and reports, Staff recommends not to include Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C in the 15-day language for 2022. This subject may be advisable to be revisited in the 2025 Code Development. (Same subject as in line item # 63, 71, 118, 149 and 162)	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563

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238269.013	Charles Knuffke (Wattstopper)	Exception 1 to §130.2(c)3: We believe a mistake was made when this exception's language in the previous 2016 code was changed in 2019 to provide a single wattage of 40W for all exterior lighting types versus separate wattages for pole lights, non-pole lights, and a W/ft for linear lighting. We strongly advocate that linear lighting should be returned to the previous 2016 code's max based on W/ft rather than a total wattage per luminaire.	The change in this exception's language was made during the 2019 proceeding, changing from the 2016 code. The change in the 2019 proceeding was not a mistake; it was developed for simplification of compliance with one compliance threshold for motion sensing controls of Section 130.2(c)3 - a 40W threshold for all outdoor luminaires instead of three compliance thresholds (for three different types of outdoor luminaires). We also note that discussing changes in the 2019 code is outside the scope of this rulemaking, which concerns the 2022 code update.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.014	Charles Knuffke (Wattstopper)	§130.1(f)7: it contradicts what is in the new Section 130.1(c)6D, which allows the occupancy sensors in offices greater than 250ft2 to bring the lights to full on when their individual zones are occupied. Our recommendation is that the requirement concerning partial on levels should be left in place in Section 130.1(c)5 (where it then won't contradict the allowed full on option for offices greater than 250 ft2 in Section 130.1(c)6D) and delete it from here.	In order to accommodate the new Section 130.1(c)6D and also to meet the multilevel requirement, the requirement about partial-on levels of Section 130.1(c)5 are left as-is.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238269.015	Charles Knuffke (Wattstopper)	Exception 3,4,5 to §130.1(d)1: 1.We have found it difficult for designers to understand this code language. It's not clear if the word "and" is being used to indicate a list of areas in the code or is being used as "added to" in the mathematical sense. 2.Additionally - Exception 5 to Section 130.1(d)1 makes little sense since it can cancel out control requirements in a primary zone greater than 120W (or in a secondary zone that's greater than 120W) when the other zone is less than 120W. We believe it would be easier to understand if the language in the code was re-written for clarity.	1.To help designers and code user to understand the requirements, staff recommends to add "combined" to the phrase, "the combined total installed wattage of general lighting in the skylit and primary sidelit zones", and to revise "in the daylight zones" as "for those zones". 2.Staff recommends to delete Exception 5 to Section 130.1(d), which has been rendered outdated by the revised Exception 3 added in 15-day language. This change also addresses the concerns as expressed in the comment.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.016	Charles Knuffke (Wattstopper)	§130.1(d)3C: It's been our experience that some inexpensive LED drivers at 10% can have issues with flicker when at that level. We have rarely seen issues with fixtures at 20%, which is why we suggest a max 80% reduction.	Staff appreciates the information provided for reference and for consideration that some fixture products in the marketplace may not be able to meet the requirement of dimming down to 10 percent level without flickering. It is part of the acceptance test requirement that the lighting system could not be flicker in order to pass the acceptance test and to meet the daylight dimming to 90 percent requirement. Building projects with the daylight controls acceptance test passed should expect to see the benefit of energy savings from the daylight controls dimming to 10 percent and also having lighting system performing satisfactorily without noticeable flicker.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.017	Charles Knuffke (Wattstopper)	§130.1(d): We believe it makes great sense to bring the secondary Sidelit Daylit Zone requirements out of Section 140.6(d) and move them into this section.	Staff appreciates the comment supporting the proposed amendment.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562

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238269.018	Charles Knuffke (Wattstopper)	§130.1(c)8: We still believe captive key cards are a simple way to provide lighting control in hotel rooms and should remain.	Some commenters support captive card key controls as an allowed means of controls, whereas some other commenters advocate removing and perhaps to allow it under an exception for small hotels having 50 rooms or less. The Commission disagree that the captive key card technology should be disallowed based on reports that a captive key card control was defeated by some user. Defeating a control mechanism is nothing new as it may happen to every control technology when some users decide to do so to serve their own good. More importantly, captive key card controls do save energy when it is used properly - similar to occupancy sensing controls and other automatic controls - that the controls turn off the power after a period of time the room has been vacated.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.019	Charles Knuffke (Wattstopper)	§130.1(c)6D: We would suggest only a small edit – in Section 130.1(c)6Div, instead of stating: “...lighting shall be allowed to automatically turn on to full power upon occupancy...” it should read: “...lighting shall be allowed to automatically turn on to any level up to full power upon occupancy...”	The suggested edit could help code users to better understand the requirement and staff recommends to make the suggested edit to Section 130.1(c)6Div.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.02	Charles Knuffke (Wattstopper)	§130.1(c)6A: We have reviewed the text in the first paragraph, and while a significant part of the text is underlined, we cannot discern any actual change from current 2019 code text. Was the text here supposed to be updated?	The text of this Section 130.1(c)6A is same as the 2019 language/text - no change from the 2019 Code in this section. (No 15-day edits for this item.)	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.021	Charles Knuffke (Wattstopper)	§130.1(c)6: We do not understand why spaces in this section must now go “Partial OFF” instead of the current 2019 code “full or partial OFF” requirement. Based on the definition of “Partial Off” in Section 100.1 this is incorrect - Partial Off does not include full off, so we believe a mistake has been made with this proposed change. Additionally, shouldn't this be "offices greater than 250 square feet" for this Section 130.1(c)6?	1. Staff recommend to add "Full or" at the beginning of the sentence - so that it has similar language to the 2019 language. 2. Staff recommend to revise it as "offices greater than 250 square feet".	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.022	Charles Knuffke (Wattstopper)	§§130.1(c)6 and 7: Previously the language in these sections applied to all lighting in the specified areas, but we've noted that a change was made in the initial paragraphs to state that these sections now only apply to General Lighting. We find this an interesting change, which may eliminate an issue we've seen in hotel corridors where both overhead lighting and small lights to illuminate the room numbers are present. We hope this proves to be a positive update in the code language.	Staff appreciates the comment supporting the proposed amendment.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.023	Charles Knuffke (Wattstopper)	§130.1(c)5: We respectfully request that except for the addition of the below paragraph (which previously was in Table 130-A), all edits to this section be removed and the current 2019 code language be left as is. [proposed language on PDF page 8]	Staff appreciates and agrees with the comments. This section was reverted to the 2019 language, and all references to "sensors" were changed to "sensing controls."	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.024	Charles Knuffke (Wattstopper)	§130.1(c)5: We are once again stating that we've seen no documented reason why small offices, multipurpose rooms, classrooms, conference rooms that are required to follow Table 130 – A should be allowed to go full on at initial occupancy instead of following the current 2019 code's Manual On or Partial On to 50-70 percent requirement.	Staff appreciates and agrees with the comments. This section was reverted to the 2019 language, and all references to "sensors" were changed to "sensing controls."	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562

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238269.025	Charles Knuffke (Wattstopper)	§130.1(c)5: We strongly advocate that Title 24 not move backwards by adopting the proposed changes in this section. We should not allow the occupancy sensor's sequence of operation to bring lighting full on when the general lighting requirements of Section 130.1(b) are met for the listed space types.	Staff appreciates and agrees with the comments. This section was reverted to the 2019 language, and all references to "sensors" were changed to "sensing controls."	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71162
238269.026	Charles Knuffke (Wattstopper)	§130.1(c)2: We've been asking the CEC to reconsider their decision to eliminate Countdown Timer Switches from all but the two remaining spaces allowed in Title 24 since this change was first introduced. We will again point out that a properly set timer switch will save energy in many applications, especially storage facilities. We also believe the original change was done without a CASE study – something that should have been required for the removal of a commonly used device from the California marketplace. <u>Our request would be to set a maximum time setting for Countdown Timers of 20 minutes and allow designers to use them for any lighting not specifically called out in Sections 130.1(c)5-8.</u>	There is no proposed change to §130.1(c)2 and its language - the requirement of it stays the same as is to the 2019 language. Also the 2019 and the 2016 code Section 130.1(c)1E are the same requirements with the wordings arranged differently. The net effects of the language are expected to be the same. Countdown Timer Switches is considered a semi-automatic control devices that it requires the user to actuate the countdown timer switch to start the time countdown. If there is no actuation, the countdown timer switch would not do anything to the lighting connected to the countdown timer switch circuit. Based on the above, countdown timer switches are not an automatic controls - unlike occupancy sensing lighting controls that provides automatic control and does not take human intervention to turn on and off the connected lighting. The suggestion request to add countdown timer switch for any lighting not specifically called out in Section 130.1(c)5-8 as a mandatory requirement is considered as a new measure and new measures are required to be documented in a CASE measure document.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71162
238269.027	Charles Knuffke (Wattstopper)	§130.1(c)1E: We note in the Initial Statement of Reasons 2022 Energy Code Proposed Changes that the reason given for this change is that Manual On switches are required in Section 130.1(a). This is incorrect – that Section references Manual Switches, not Manual On Switches, so we wonder why this was the reason provided for the elimination of this requirement.	Staff agree that automatic time-switch control may include a manual-on mode. Section 130.1(c)1E has been reverted to 2019 language.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71162
238269.028	Charles Knuffke (Wattstopper)	Exception 6 to §130.1(c)1: This is not an exception to the entire Section 130.1(c), so we may be reading it incorrectly. Unfortunately, many will have a hard time understanding how to meet the stairwell requirements called out in Section 130.1(c)6 and Section 130.1(c)7 with this exception in place, especially since these spaces are typically egress areas, and the new egress requirement called out in Exception 2 to Section 130.1(c) seems to override all others.	The comment is well taken, and staff recommended the Commission not adopt the proposed language of "Exception 6 to §130.1(c)1" about shut off controls for egress stairwells. As such, this comment was addressed by deleting the proposed exception language from the adopted language.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71162
238269.029	Charles Knuffke (Wattstopper)	Exception 6 to §130.1(c)1: During normal working hours, stairs often have light levels well above the egress requirement of one footcandle average, so controls should at least cut lighting back at least 50% and to no more than 1FC to maintain life safety requirements. We note that multiple firms have brought out lighting products for this specific application based on research that originated in California.	Some stairways maybe designated as a means of egress, and the Energy Code has included a provision for a portion of the stairwell lighting designated for means of egress to be exempted from the automatic shutoff controls requirements. Also, bi-level controls for stairwell lighting can provide a level of lighting during occupied and unoccupied period, and stairwell could be designed to be lit at all times - fully lit or dimmed. Based on the above, staff did not adopt the proposed language of "Exception 6 to §130.1(c)1" about shut off controls for egress stairwells and deleted Exception 6 from the adopted language.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71162

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238269.03	Charles Knuffke (Wattstopper)	Exception 6 to §130.1(c)1: We are surprised to see that stairwells have been exempted from the shutoff control requirements in Section 130.1(c)1, since this would be a major rollback in efficiency.	Some stairways maybe designated as a means of egress, and the Energy Code has included a provision for a portion of the stairwell lighting designated for means of egress to be exempted from the automatic shutoff controls requirements. Also, bi-level controls for stairwell lighting can provide a level of lighting during occupied and unoccupied period, and stairwell could be designed to be lit at all times - fully lit or dimmed. Based on the above, staff did not adopt the proposed language of "Exception 6 to §130.1(c)1" about shut off controls for egress stairwells and deleted Exception 6 from the adopted language.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.031	Charles Knuffke (Wattstopper)	§130.1(c)1D – Shut Off Controls for Different Lighting Types: We wonder if this line could be deleted, but for now suggest this section be altered. [suggested language PDF page 6]	The suggested word "controllability" means the ability to control, and the requirement with the word "controllability" still requires the listed controls to provide separate control capability. Adding this would make the requirement of Section 130.1(c)1D is redundant to Section 130.1(a)3. Based on the above, staff concluded that it was necessary to delete the redundant requirement of Section 130.1(c)1D and the language was removed from the adopted language.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.032	Charles Knuffke (Wattstopper)	§130.1(c)1D – Shut Off Controls for Different Lighting Types: The requirement for the separate override devices is already called for in Section 130.1(a)3. Since multiple manual area controls (which serve as override devices) are required when there are different types of lighting, there's no reason to restate this in the shut off control section.	There is a separate controls requirement in Section 130.1(a)3 and having another separate control requirement in Section 130.1(c)1D is redundant. Based on the above, staff concluded that it was necessary to delete the redundant requirement of Section 130.1(c)1D, and the language was removed from the adopted language.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.033	Charles Knuffke (Wattstopper)	§130.1(c)1D – Shut Off Controls for Different Lighting Types: Since this requirement is in the Shut Off control section, one might assume that "controls" would be the named shut off devices – i.e., a timeclock or motion detector. However, it would make little sense to install multiple occupancy sensors or multiple timeclocks in a single retail zone. What the code should be stating is the need for separate controllability for general, display, ornamental, and display case lighting and separate override devices for general, display, ornamental, and display case lighting. Separate controllability is assured when these lighting types are controlled using separate load control devices – relays, contactors, or other.	Staff determined that the suggestion to completely remove the two exceptions could confuse code users rather than clarifying the requirements. There was insufficient time to present the suggested removal to the public during this code cycle. For the above reason, staff did not make the change. Staff could consider modifying the exceptions in future code cycles.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.034	Charles Knuffke (Wattstopper)	EXCEPTION 1 to §130.1(b): With the ubiquity of dimmable fixtures, we wonder why this specific exception isn't deleted entirely since the multilevel requirement only applies when the general lighting in a space $\geq 100\text{ft}^2$ is $>.5\text{W}/\text{ft}^2$. This may have been a concern previously but does not seem as important now.	it is certainly feasible to acquire dimmable fixtures as many quality products are available in marketplace. In a space with one luminaire, the cost savings from having a dimming control to a dimmable luminaire could pay off and more data is necessary to prove whether it is cost effective. The Commission may visit this subject in future and consider to remove this Exception based on future finding.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.035	Charles Knuffke (Wattstopper)	EXCEPTION to §130.1(a): Appreciate that the CEC plans on reducing the current 2019 code's .2W exception to .1W, since this aligns with the .1W called out in EXCEPTION 3 to Section 130.1(c)1 for Shut Off control in Egress Areas.	Staff thank and appreciate the comment for supporting the proposed amendment.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562

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238269.036	Charles Knuffke (Wattstopper)	Exception to 130.1(a)2: Based on the commonsense approach taken in the above edit to Exception to Section 130.1(a)1, we would ask the CEC to consider a similar update to this exception (which over time has grown unwieldy with the addition of so many different spaces to the list). We strongly believe that designers should be able to use remote mounted or visually annunciated manual area controls wherever the design of the project would benefit from their use. [suggested elimination of Exception 1 and 2; proposed language PDF page 6]	Staff appreciates the suggestion. Exception 1 and Exception 2 are installation means quite different from Section 130.1(a)2 that (a) 2 is about the manual controls be located in the same area with the lighting being controlled. Exception 1 and Exception 2 are about the manual controls being located somewhere else and outside the area where the lights are being controlled. (No to suggestion.)	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.037	Charles Knuffke (Wattstopper)	Exception to 130.1(a)1 We greatly appreciate the addition of "and areas of the building intended for access or use by the public" to this paragraph.	Staff appreciates the comment supporting the proposed amendment.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.038	Charles Knuffke (Wattstopper)	120.1(d)5 We want to thank the CEC and their advisors for the edits and (it is) now clearly indicates that when occupancy sensors are used to control space ventilation, a 5 minute grace time is allowed from when the occupancy sensors provide an unoccupied signal to when the HVAC system must react.	Staff appreciates the comment supporting the proposed amendment.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.039	Charles Knuffke (Wattstopper)	Common Use Areas Can Table 170.2-M be considered an exhaustive list of all Common Use Areas?	Table 170.2-M is listed with lighting power densities for areas that are outside of the dwelling units in a multifamily building - these could be common use areas as well as common service areas. To avoid unnecessary confusions, Staff do not advise the Table information to be used as an exhaustive list of all Common Use Areas.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.04	Charles Knuffke (Wattstopper)	100.1 Common Living Area (Definition) We suggest example space be listed fo this term to ensure no confusion.	Instead of adding example spaces which may cause further confusions, Staff proposed the inclusion of clarifying information, an exception to Section 160.5(b), that lighting systems in common use areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units that would otherwise lack these provisions may instead comply with Section 160.5(a) - Dwelling Unit Lighting.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238269.041	Charles Knuffke (Wattstopper)	100.1 Common Use Area (Definition) We believe Common Use Area is the aggregate of all Common Living Areas and Common Service Areas – if this is the case, the definition should state this outright.	Staff removed the use of the terms "common living" and "common service" areas, to instead consistently use the defined term "common use" and instead rely on an exception and directly stated qualifications for when common use areas can be designed according to residential design principles. This resolves the noted confusion of terms.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562
238270.001	Alan Solomon	It has been proven that natural gas and/or fossil fuels in buildings or homes produces excess CO2 in our atmosphere. CO2, methane and other pollutants are becoming more and more toxic with each passing day. This practice of including natural gas hook-ups in new construction has to be stopped. The evidence is clear that all-electric buildings and homes are becoming more popular throughout California for a multiple of reasons. It just makes sense today, to minimize ones footprint as well as minimize your buildings footprint. It is smarter for the future, cheaper in the long run and electrical building technology is becoming more and more efficient for building owners in California and for the American public throughout.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoding risks of significant market shortages and disruptions.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238270

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238272.001	Curt Rich (North American Insulation Manufacturers Association)	NAIMA appreciates the transparent nature and many opportunities for stakeholder input during the course of both the informal and formal Title 24 rulemaking process.	Staff appreciates the comment of support.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238272
238272.002	Curt Rich (North American Insulation Manufacturers Association)	The CASE teams and Energy Commission staff are to be commended for their excellent work product describing and supporting proposed code modifications.	Staff appreciates the comment of support.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238272
238272.003	Curt Rich (North American Insulation Manufacturers Association)	NAIMA broadly supports the 45-day language for the 2022 single family, multi-family, and non-residential building code.	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238272
238272.004	Curt Rich (North American Insulation Manufacturers Association)	NAIMA supports mandatory minimum requirements for thermal insulation. Establishing a mandatory minimum insulation for roof deck insulation in new residential buildings won't compel builders to actually build homes with high performance attic insulation systems (a prescriptive requirement introduced in the 2016 Title 24 residential code), but it will ensure that California homes are increasingly insulated with minimum levels of both ceiling and roof deck insulation. This change is welcomed as it is a step in the right direction, but increased mandatory requirements in this space are recommended.	Staff appreciates the comment supporting the proposed amendments.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238272
238272.005	Curt Rich (North American Insulation Manufacturers Association)	NAIMA supports limited trade-offs against envelope efficiency. Builders are universally trading off HVAC equipment that exceeds minimum federal efficiency standards against high performance insulation requirements set by Title 24. Additionally, . . . 90%+ market penetration of HVAC space heating and cooling equipment indicates that the market has been largely transformed, and the next place to capture savings is in the envelope. The Commission can correct this and enact a code that results in better performing buildings by establishing three separate energy design ratings ("EDR") – Building Envelope Efficiency, Building Heating and Cooling Systems, and Solar Electric Generation and Demand Flexibility – combined to arrive at Total EDR. Trade-offs should be prohibited between these three separate EDR categories. This approach avoids mandatory thermal envelope or R-value or U-factor requirements and provides builders with flexibility while still delivering an advanced thermal envelope.	This suggestion is outside the scope of this rulemaking. This would be a major change to compliance and would need to be thoroughly evaluated before implementing. However, staff will consider this for 2025.	6/17/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238272
238275.001	Joan Crowe (GAF)	GAF is concerned that the proposed addition of a new mandatory requirement for installation of insulation at the roof deck may have significant detrimental effects for homeowners and building owners, particularly as it relates to asphalt shingles, as these products are the most popular and cost-effective roofing system for single-family residential buildings in California. We oppose the proposal to mandate roof deck insulation.	The U-factor is derived from JA4, and the original proposal which called for R-4 above deck insulation was revised to R-4 below deck insulation specifically to address ARMA's concerns over asphalt shingles not being able to be install with above deck insulation. The use of U-factors allows for design flexibility. Not everyone will choose to install an asphalt shingle roof, and therefore may opt to install above deck insulation as opposed to below deck insulation.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?hu=238275

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238275.002	Joan Crowe (GAF)	By using a U-factor to express the requirement, the proposed provision permits insulation to be located either above or beneath the roof deck. Placement in either of these locations is problematic. Roofing systems of all types are also required to comply with California building codes which include requirements related to proper product installation, wind resistance, and fire resistance. Mandating insulation at the roof deck may impact compliance with one or more of those existing provisions, creating conflicts for designers and installers.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238275.003	Joan Crowe (GAF)	Asphalt shingles are designed for installation to a rigid substrate, making insulation on top of a steep-slope roof deck an unsuitable option for an asphalt shingle system. Attempts to install asphalt shingles on a non-rigid substrate may lead to damage of the shingles.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238275.004	Joan Crowe (GAF)	California building codes require asphalt shingle installation in accordance with manufacturer instructions, which prescribe application to a rigid deck. Therefore, the proposed new language creates a conflict with provisions of the existing building codes.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238275.005	Joan Crowe (GAF)	Although it may be the intent of the CEC to have insulation placed beneath the roof deck rather than above, use of a U-factor to express the requirement creates opportunity for misinterpretation with unintended consequences.	The U-factor is derived from JA4, and the original proposal which called for R-4 above deck insulation was revised to R-4 below deck insulation specifically to address ARMA's concerns over asphalt shingles not being able to be install with above deck insulation. The use of U-factors allows for design flexibility. Not everyone will choose to install an asphalt shingle roof, and therefore may opt to install above deck insulation as opposed to below deck insulation.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238275.006	Joan Crowe (GAF)	Wind Resistance Code Requirements: Installation of asphalt shingles directly over insulation instead of a rigid substrate affects critical performance characteristics of the installed system. Wind resistance may be compromised due to inadequate nail holding ability when fasteners are driven into insulation instead of a proper deck sheathing material. More importantly, this prevents the use of existing asphalt shingles' wind resistance classifications, because roofing assemblies are tested where the shingles and underlayment are installed directly over a solid substrate.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238275.007	Joan Crowe (GAF)	Fire Resistance Code Requirements: There are potential adverse effects on the fire classification of the installed asphalt shingle roofing assembly when insulation is positioned between the roof deck and the asphalt shingles. And as previously stated, this will also prevent the use of asphalt shingles' fire resistance classifications, because the roofing assemblies were not tested using this configuration.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation. Also, Staff communicated with the California State Fire Marshal regarding this measure and there was no concerns found.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238275.008	Joan Crowe (GAF)	Mandating insulation at the roof deck may affect the long-term effectiveness of asphalt shingles. Placement of insulation on the underside of the roof deck can interfere with continuous, free-flow ventilation beneath the roof deck surface, leading to higher exposure temperatures for the asphalt shingles and the potential for moisture buildup within the attic space, both of which may impact system durability and disadvantage consumers who select asphalt shingles as their preferred roof covering.	The Energy Code ventilation requirements take precedent for spaces identified in the Energy Code, even if the space is also identified in the Mechanical Code. This was clarified in proposed language to the Mechanical Code which was adopted by the Energy Commission in the part 11+ rulemaking.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275

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238275.009	Joan Crowe (GAF)	The effect of mandatory insulation at the roof deck level on management of moisture in an attic space is another important consideration. Installation of insulation above or below the roof deck can change the characteristics of an attic space. Without proper analysis of an additional layer of insulation that may or may not act as an air barrier and/or vapor retarder, the hygrothermal performance of the attic space is unknown and may lead to unintended consequences.	Study by Ian Walker and UC Berkley on ventilated vs. unventilated attics showed that below deck insulation in a ventilated attic does not change the moisture accumulation.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238275.01	Joan Crowe (GAF)	Regardless of the roof covering selected, the proposed new provision will cause consumers to absorb considerably higher construction costs attributable to the extra labor and materials associated with insulation installation at the roof deck level, which is a more complicated and challenging process than placement of insulation at the ceiling level. Whether these higher costs will be returned to owners via energy savings is uncertain.	Our proposal is based on below deck insulation, specifically to address this concern over above deck insulation. This proposal has shown to be prescriptively cost effective in the 2016, 2019 Building Energy Efficiency Standards.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238275
238276.001	Pekka Hakkarainen (Lutron)	Section 110.12(c) Demand Responsive Lighting Controls. Lutron comments: Change "general lighting power" to "design lighting power" to align with the CASE report on this topic.	Staff has clarified the phrasing of these requirements to use the phrase "total lighting power", which addresses this comment. However, it should be noted this remains conditioned on the requirement in Section 130.1(b) to install dimming controls that is applicable only to general lighting. To be cost effective, Demand Response controls must control a minimum quantity of installed lighting, and said lighting must additionally be equipped with dimming controls so as to avoid disruption of building operations (which would be caused by lighting going to OFF). This necessarily restricts the conditions under which the Energy Code can require installation of demand responsive controls as part of a minimum building efficiency standard.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238276.002	Pekka Hakkarainen (Lutron)	Section 130.1(a) Manual Area Controls. We support the change made to Section 130.1(a)3. This change clarifies how a lighting scene controller (e.g. keypad) can be used for compliance with this requirement. Projects, especially in retail applications, would rather not have separate wall controls for each type of lighting but rather one scene control with buttons that can independently control the general lighting from other lighting types.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238276.003	Pekka Hakkarainen (Lutron)	Section 130.1(a) Manual Area Controls. Our request of the Commission to allow this new explanatory language to be retroactive to the current Title 24 2019 as has been done before with lighting control requirements for alterations. This change is needed now so that projects don't have to incur the unnecessary costs of installing unneeded manual wall controls when one scene control provides the necessary functionality to separately control general lighting from other lighting types.	Staff has reviewed the 2019 language to determine if the language currently in effect can be interpreted to have the same meaning as the clarified language proposed for adoption into the 2022 Energy Code. That said, any adopted revisions in the 2022 Energy Code will become effective at the same date as the rest of the 2022 Building Standards Code - staff does not have the ability to make this provision separately effective ahead of that date. Therefore, no change was made in response to this comment.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563
238276.004	Pekka Hakkarainen (Lutron)	Thank you for adding the clarification to section 130.1(c)6Dii to make it clear that turning lighting OFF in unoccupied control zones is also compliant.	Staff appreciates the comment supporting the proposed amendment.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71563

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238276.005	Pekka Hakkarainen (Lutron)	Section 130.1(c)8. Captive card key controls should not be considered an equivalent compliance option to occupant sensing or automatic controls in hotel guestrooms. Captive card key controls are a manual control (not automatic) that are easily and often bypassed thereby negating any potential energy savings. If they are to remain as an option, then only permit them to comply in the smaller hotels/motels. The larger hotels should be required to use automatic guestroom controls that will guarantee the energy savings and provide guests with a more satisfactory experience. [suggested language PDF page 5]	Some commenters support captive card key controls as an allowed means of controls, whereas some other commenters advocate to have it removed and perhaps to allow it under an exception for small hotels having 50 rooms or less. Based on staff's analysis, staff determined that the captive key card technology should not be disallowed based on reports that a captive key card control may have been defeated. Defeating a control mechanism is nothing new as it may happen to every control technology when some users decide to do so to serve their own good. More importantly, captive key card controls do save energy when it is used properly - similar to occupancy sensing controls and other automatic controls - that the controls turn off the power after a period of time the room has been vacated. Staff determined that disallowing this approach would not be appropriate; no change was made as a result of this comment.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2382698&DocumentContentId=71563
238276.006	Pekka Hakkarainen (Lutron)	Strike 150.0(k)1Ci which prohibits screw-based sockets in recessed ceiling downlight luminaires. This prohibition is not needed anymore as lighting has become substantially more energy efficient per JA8 and standards such as Title 20, so users can't easily swap screw-based lamps out with less efficacious models. What's more is that recessed ceiling downlight luminaires with screw-based sockets are already obligated to use high efficacy lamps per 150.0(k)B which requires all screw-based luminaires to use Table 150.0-A qualifying lamps. [suggested language PDF page 5]	While staff agrees that lighting had become more energy efficient as more LED lamps and LED luminaires products have become available, and that replacing less-efficient legacy light sources such as incandescent lamps and HID light sources has become more commonplace, the nature of screw type sockets allows the lighting to be easily changed out for incandescent lighting. As incandescent bulbs are still available in marketplace for purchase, there is still likelihood these bulbs would be installed in screw-based luminaires. Therefore, staff determined that the prohibition of screw-based sockets remains justified and appropriate.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2382698&DocumentContentId=71563
238276.007	Pekka Hakkarainen (Lutron)	Section 150.0(k)2E Automatic Off Controls. The requirement to initially setup occupancy sensors to operate like a vacancy sensor should be removed since either occupancy sensors or vacancy sensors are permitted for compliance. They both save energy by automatically turning lights off when spaces are vacant. The spaces in the requirement are the utility spaces that customers prefer to use occupancy sensors in instead of vacancy sensors as occupancy sensors provide them the convenience of automatic on/off functionality. Vacancy sensors are preferred more in habitable living spaces. We urge the Commission to not force projects to initially setup less desirable functionality for these spaces.	Staff removed the sentence requiring the specified initial configuration, consistent with the commenter's request.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2382698&DocumentContentId=71563
238276.008	Pekka Hakkarainen (Lutron)	Section 150.0(k)2E Automatic Off Controls. The phrase "using the manual control required under Section 150.0(k)2A" is not needed since Section 150.0(k)2C already requires a readily accessible wall-mounted manual on/off control, no need to restate it here. Restating this requirement in Section 150.0(k)2E causes confusion as some interpret the language to mean that the manual control must be used to configure the occupancy sensor to manual-on. Thus, striking the last sentence allows for more user satisfaction and reduces confusion. [suggested language PDF page 6]	Staff removed the sentence requiring the specified initial configuration, consistent with the commenter's request.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2382698&DocumentContentId=71563

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238276.009	Pekka Hakkarainen (Lutron)	Section 150.0(k)2F Dimming Controls. Thank you for reducing the circuit wattage threshold to 20 watts for dimming controls and excepting spaces that use occupancy or vacancy sensors. The previous threshold of 50 watts would have been a backslide in energy efficiency and would have essentially eliminated the requirement. While we would have preferred no wattage threshold as done with Title 24 2019 and in previous versions of the Standard, we accept the 20-watt threshold.	Staff appreciates the comment supporting the proposed amendment.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238265&DocumentContentId=71563
238278.001	Christian Hurd	I approve of the code changes applying to data center economizers as shown.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238278
238279.001	Spectrum Mechanical	I approve of the code changes applying to data center economizers as shown.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238279
238280.001	Steven Mesh (Lighting Eduction + Design)	Reiteration of Comments by Charles Knuffke, made on March 17th.	Ditto (see the Commission's responses to Charles Knuffke's comments).	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238280
238282				6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282
238282.001	Shawn Mullins (Owens Corning)	We support the Commission's efficiency and carbon reduction goals for residential homes and nonresidential buildings. In doing so, it is critical that the Commission maintain the historical and well established loading order of focusing on energy efficiency first, followed by renewables and associated technology.	Staff appreciates the comment of support.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282
238282.002	Shawn Mullins (Owens Corning)	Compliance Path Boundaries: Additional efforts should be taken to further shore up the boundaries between efficient envelope design, renewable energy and to include an approach limiting mechanical trade-offs against the building envelope. This would be a third leg of the compliance path. One of the arguments supporting such boundaries with renewable energy devices is their shorter lifespans as compared to the building envelope/structure, and the lack of guarantees regarding maintenance and end-of-life replacement with like equipment. The same argument applies for mechanical systems. Any device or system that requires ongoing maintenance, along with shorter lifespan as compared to the building envelope should not be given equivalent compliance credit when compared to longer lasting assemblies.	This is outside the scope of this Rulemaking, and not something that we could entertain at this time. This would be a major change to compliance and would need to be thoroughly evaluated before implementing. However, staff will consider this for 2025.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282

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238282.003	Shawn Mullins (Owens Corning)	Embodied Carbon Material Properties. Regardless of the all electric vs. mixed fuel debate ends up regarding new connections and new generation facilities, the fact remains that there will be millions of existing homes and businesses continuing to be served by mixed-fuel systems. Any attempts to convert this existing building stock will likely be a generational effort at best. Therefore, it seems prudent that we begin considering how we can more appropriately weight the embodied carbon properties of our building materials, and, incentivize the use of those materials which perform better in this regard.	This is outside the scope of this Rulemaking, and not something that we could entertain at this time. This would be a major change to compliance and would need to be thoroughly evaluated before implementing. However, staff will consider this for 2025.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282
238282.004	Shawn Mullins (Owens Corning)	Embodied Carbon Material Properties. If we don't start considering this now, we will only fall further behind.	This is outside the scope of this Rulemaking, and not something that we could entertain at this time. This would be a major change to compliance and would need to be thoroughly evaluated before implementing. However, staff will consider this for 2025.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282
238282.005	Shawn Mullins (Owens Corning)	Embodied Carbon Material Properties. Acting on this metric would supplement existing legislation such as Buy Clean California, The Clean Air Act, and other state and national carbon reduction efforts.	This is outside the scope of this Rulemaking, and not something that we could entertain at this time. This would be a major change to compliance and would need to be thoroughly evaluated before implementing. However, staff will consider this for 2025.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282
238282.006	Shawn Mullins (Owens Corning)	Embodied Carbon Material Properties. This is not an easy task and we acknowledge that the road forward is likely to be challenging in some fashion for all parties. However, given our internal commitment to sustainability, Owens Corning remains willing to collaborate with the Commission and other stakeholders on how we might incorporate an embodied carbon metric and related components into the California Energy Code.	This is outside the scope of this Rulemaking, and not something that we could entertain at this time. This would be a major change to compliance and would need to be thoroughly evaluated before implementing. However, staff will consider this for 2025.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282
238282.007	Shawn Mullins (Owens Corning)	As it pertains building envelope insulation requirements, we feel that the prescribed values should be mandatory and not subject to trade-off and should be enhanced above the current baseline – either in this code cycle or at minimum on the table for 2025. [provides list of reasons on PDF page 4]	This is outside the scope of this Rulemaking, and not something that we could entertain at this time. This would be a major change to compliance and would need to be thoroughly evaluated before implementing. However, staff will consider this for 2025.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238282
238284.001	Jordan Garbayo (3C-REN)	3C-REN supports Express Terms for the 2022 Building Energy Efficiency Standards that: Establish prescriptive requirements and update performance baselines for all-electric space and water heating in as many building types and climate zones as is cost-effective.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.002	Jordan Garbayo (3C-REN)	3C-REN applauds the CEC for proposing prescriptive requirements and updating performance baselines for cost-effective all-electric space and water heating as a means to accelerate California's decarbonization goals.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.003	Jordan Garbayo (3C-REN)	3C-REN is pleased to see the CEC will provide compliance credits as a leverage point to encourage the building industry to incorporate heat pump technologies and other electric measures into their projects	Staff appreciates the comment of support.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.004	Jordan Garbayo (3C-REN)	3C-REN supports the CEC's proposed Express Terms to require buildings built with gas to be electrification-ready.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.005	Jordan Garbayo (3C-REN)	3C-REN agrees with comments from Mayor Cathy Murillo with the City of Santa Barbara, located in the tri-county region, which express that all-electric homes offer additional health benefits due to the elimination of air pollutants emitted by gas appliances.	Staff appreciates the comment	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284

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238284.006	Jordan Garbayo (3C-REN)	Gas appliances pose a greater risk on low-income communities as these air pollutants are most acute for apartments due to a smaller residence size.	Staff appreciates the comment	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.007	Jordan Garbayo (3C-REN)	3C-REN also agrees with and supports the CEC's efforts to further tighten fossil fuel baselines for new mixed-fuel buildings and support paths to equitable electrification.	Staff appreciates the comment of support.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.008	Jordan Garbayo (3C-REN)	3C-REN supports Express Terms for the 2022 Building Energy Efficiency Standards that: Require PV and battery storage for many building types.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.009	Jordan Garbayo (3C-REN)	3C-REN supports Express Terms for the 2022 Building Energy Efficiency Standards that: Address energy efficiency opportunities in existing residential and nonresidential buildings.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.01	Jordan Garbayo (3C-REN)	3C-REN supports CEC's efforts to address cost-effective savings opportunities in existing buildings. Enhancing the performance of existing buildings is critical to ensuring residents and businesses in the 3C-REN territory can upgrade their buildings with cost-effective improvements that simultaneously lower their energy loads and optimize those loads for electrification and decarbonization	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.012	Jordan Garbayo (3C-REN)	3C-REN supports the CEC's proposed terms to: Update and enhance requirements relating to duct sealing and ventilation.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.013	Jordan Garbayo (3C-REN)	3C-REN supports the CEC's proposed terms to: Improve energy efficiency standards for commercial and industrial process loads including, computer room air conditioning, refrigerated areas, fan systems compressed air systems, and steam traps.	Staff appreciates the comment supporting the proposed amendments. Staff notes that computer room dehumidification requirements relating to refrigerant-based economizing were not adopted owing to other received public commentary, though the amendments relating to other forms of economizing were retained.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.014	Jordan Garbayo (3C-REN)	3C-REN supports the CEC's proposed terms to: Improve nonresidential and multifamily efficiency standards for building envelopes (e.g., exterior walls, windows, roofs, and floors), fan and duct systems HVAC controls, boilers and service water heating systems, indoor and outdoor lighting systems, and grid integration equipment such as demand responsive controls.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.015	Jordan Garbayo (3C-REN)	3C-REN supports Express Terms for the 2022 Building Energy Efficiency Standards that: Address energy efficiency opportunities for indoor growing/horticulture operations.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.016	Jordan Garbayo (3C-REN)	3C-REN supports the efforts of the CEC to help the rapid growth of indoor growing and horticulture operations be done so with a focus on cost-effective, energy efficiency that can help balance California's overall energy needs with the economic opportunities these operations provide.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.017	Jordan Garbayo (3C-REN)	3C-REN supports the proposed 2022 updates to establish new energy efficiency standards for lighting, envelope, and space conditioning systems serving controlled environment horticulture spaces.	Staff appreciates the comment supporting the proposed amendments. Staff notes that dehumidification requirements were further refined based on received public commentary.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.018	Jordan Garbayo (3C-REN)	3C-REN supports Express Terms for the 2022 Building Energy Efficiency Standards that: Restructure the multifamily energy standards.	Staff appreciates the comment supporting the proposed amendments creating the multifamily chapters.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284
238284.019	Jordan Garbayo (3C-REN)	3C-REN supports the proposed restructuring of the multifamily energy code by construction and mechanical equipment instead of the number of habitable stories. We believe this will help improve understanding, interpretation, and access to multifamily energy code requirements; thereby resulting in greater compliance.	Staff appreciates the comment supporting the proposed integration of "low-rise" and "high-rise" multifamily buildings..	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238284

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238284.02	Jordan Garbayo (3C-REN)	3C-REN supports the decision to require Mechanical Acceptance Testing for non-residential projects.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238284
238284.021	Jordan Garbayo (3C-REN)	3C-REN supports the direction CEC has taken to require mechanical acceptance testing for specific equipment types in non-residential projects. This provides valuable and trained expertise to ensure high performing non-residential buildings while simultaneously helping to create new jobs in the building industry.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238284
238284.022	Jordan Garbayo (3C-REN)	3C-REN suggests the CEC consider Certified Energy Analysts (CEA) be required for compliance documentation for all newly constructed residential and nonresidential projects in the next Energy Code cycle.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238284
238284.023	Jordan Garbayo (3C-REN)	3C-REN encourages the CEC to develop requirements that Certified Energy Analysts be responsible for completing required energy models and compliance forms for appropriate projects.	Staff notes that this topic was not proposed for inclusion in the rulemaking proceeding - staff encourages the commenter to complete a code change proposal for consideration within the next subsequent proceeding.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238284
238284.024	Jordan Garbayo (3C-REN)	Requiring CEAs, as trusted Energy Code experts, will bring peace of mind for jurisdictional building department staff in knowing that energy calculations are accurate.	Staff notes that this topic was not proposed for inclusion in the rulemaking proceeding - staff encourages the commenter to complete a code change proposal for consideration within the next subsequent proceeding.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238284
238284.025	Jordan Garbayo (3C-REN)	This requirement would boost the number of CEAs in the state and energy efficiency compliance for projects. This will usher in a new crop of energy code professionals across the state and create more well-paying and much needed jobs.	Staff notes that this topic was not proposed for inclusion in the rulemaking proceeding - staff encourages the commenter to complete a code change proposal for consideration within the next subsequent proceeding.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238284
238284.026	Jordan Garbayo (3C-REN)	Similar to HERS verification on the construction end of a project, CEAs will be involved at the design side to ensure that projects are compliant with the Energy Code early on and are successful from submittal to permit award.	Staff notes that this topic was not proposed for inclusion in the rulemaking proceeding - staff encourages the commenter to complete a code change proposal for consideration within the next subsequent proceeding.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238284
238285.001	Craig Messmer (Unico, Inc.)	We appreciate that CEC did an in-depth review of duct insulation inside wall cavities as reported in the Analysis Study dated March 5, 2021. The conclusions of the report mirror our experience. Ducts inside cavities, even if inside the conditioned space should be insulated. Our ducts have an aluminized mylar vapor barrier with a low surface emissivity (approximately 0.1). We do this to minimize thermal losses; however, as the Case Study reports, condensation will still occur unless insulated to at least R-3.0. Our standard duct insulation is an R-3.3 with optional models with R-4.2, R-6.0 and R-8.0. Only the R-3.3 fits inside a 2x4 wall cavity.	The analysis report on ducts in conditioned space concluded that condensation is not likely to be an issue for California climates. The analysis modeled a "worst-case scenario" climate zone and day for an insulated duct running through a wall cavity and calculated that very little condensation would occur and that condensation would evaporate within a few hours. Staff received comments and met with stakeholders on the topic. Staff received no reports or evidence of condensation issues for uninsulated ducts in California homes. The revision to the duct insulation requirement encourages builders to relocate ducts from an unconditioned space into the building's thermal envelope.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238285
238285.002	Craig Messmer (Unico, Inc.)	We found it interesting that the Case Study found that surface emissivity strongly influences surface temperature such that a shiny surface (low emissivity) requires more insulation. The report also confirms that lower surface emissivity reduces thermal losses. From an energy and performance view, we believe thermal losses are equally important as avoiding condensation. Thermal losses even if inside the conditioned envelope create uneven temperatures that encourage behavior changes that reduce overall system efficiency (adjusting thermostats to achieve temperatures where you need). Therefore, we recommend that all ducts within a wall cavity have R-3 insulation, not just ducts with low surface emissivity.	The analysis report on ducts in conditioned space concluded that condensation is not likely to be an issue for California climates. The analysis modeled a "worst-case scenario" climate zone and day for an insulated duct running through a wall cavity and calculated that very little condensation would occur and that condensation would evaporate within a few hours. Staff received comments and met with stakeholders on the topic. Staff received no reports or evidence of condensation issues for uninsulated ducts in California homes. The revision to the duct insulation requirement encourages builders to relocate ducts from an unconditioned space into the building's thermal envelope.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238285

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238286.001	Richard Corey (California Air Resources Board)	CEC's proposal to include heat pumps in the standard design (baseline) for residential and selected nonresidential buildings has the potential to reduce up to 40 percent of natural gas use in buildings. CEC's proposed mandatory requirements for Electric Ready buildings can help to facilitate future installation of electric appliances. These proposed code changes lay a solid foundation as we transition to a zero-emission future.	Staff appreciates the comment supporting the proposed amendments.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238286
238286.002	Richard Corey (California Air Resources Board)	CARB would like to work with CEC to further advance mandatory building electrification standards in Title 24 as soon as possible. Accelerating building electrification in the near-term is essential to put us on track to achieve both our SB 32 2030 target of 40% below 1990 levels and our mid-century climate neutrality target.	Staff is committed to continuing agency-to-agency collaboration consistent with State policies and directives.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238286
238286.003	Richard Corey (California Air Resources Board)	Thank you for your leadership and ongoing collaboration as our two agencies work towards reducing reliance on fossil fuels in buildings and achieving California's climate change and air quality goals.	Staff appreciates the comment of support.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238286
238287.001	Lauren Cullum et al. (Sierra Club California et al. - 58 entities)	Our organizations appreciate the work done by the Energy Commission to move the needle on building decarbonization. However, we urge the Energy Commission to revise the proposals to include an all-electric baseline for all building types. By doing so, the 2022 Energy Code would be more aligned with the state's goals on climate, health, and air quality.	Staff appreciates the comment of support. The CEC is committed to furthering state climate policies. The CEC has identified heat pumps as a key technology to achieve building decarbonization. However, staff identified several concerns that the market would not be ready to fully support electric-only construction in the 2022 Energy Code. Consistent with this analysis, the adopted regulations begin the transition to heat pump technology and take incremental steps towards an all-electric baseline to allow the market to adjust.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238287
238287.002	Lauren Cullum et al. (Sierra Club California et al. - 58 entities)	Since the Energy Commission commenced development of the 2022 code, over two hundred organizations - ranging from environmental, environmental justice and public health groups, to utilities such as PG&E, to air districts and local governments, to architectural and business associations - have urged adoption of an all-electric building code.	Staff appreciates the comment	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238287
238287.003	Lauren Cullum et al. (Sierra Club California et al. - 58 entities)	Many organizations provided substantial analysis demonstrating that all-electric new construction results in significant climate, air quality and public health benefits, lowers construction costs compared to homes that continue to rely on gas, and avoids the stranded asset impacts from continuing to expand fossil fuel infrastructure with gas pipelines to new homes.	Staff appreciates the comment	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238287
238287.004	Lauren Cullum et al. (Sierra Club California et al. - 58 entities)	To be a leader in the fight against the climate crisis, California must take more aggressive action in the building sector. Research has shown that this sector is a major contributor to climate emissions and poor air quality. Gas in homes and buildings have numerous negative impacts, yet California continues to add more gas customers than any other state. We cannot avoid the worst impacts of climate change without eliminating the pollution emitted from gas appliances in our homes and buildings.	Staff appreciates the comment	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238287

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238288.001	Codes and Standards Enhancement Team	For Exception 2 to Section 140.9(a)1, we recommend the following change: Keep Exception 2i, to full economizing if in addition to a non-economizing system cooling the computer room, the computer room is served by a space conditioning system economizer which can meet computer room load when the rest of spaces in the building are at 50% of design load. [suggested language PDF page 5-6]	This change was implemented.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238288
238288.002	Codes and Standards Enhancement Team	For Exception 2 to Section 140.9(a)1, we recommend the following change: We recommend that this exception be more clearly specified that the building space cooling system economizer be designed to provide full computer room economizing at 65°F outdoor dry-bulb temperature. [suggested language PDF page 5-6]	This revision was not included because this specifies a wet bulb and dry bulb temperature for all economizers. This would be different from what is done earlier in Section 40.9(a)1 where each technology has its own temperature threshold.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238288
238288.003	Codes and Standards Enhancement Team	For Exception 2 to Section 140.9(a)1, we recommend the following change: The intent of Exception 2 is to allow buildings with economizers on their space conditioning system to serve computer rooms as long as the space cooling economizer can meet computer room economizer temperature thresholds in Section 140.9(a)1A. This gives designers flexibility to use space air conditioning serving the other spaces in the building to meet 140.9(a)1 computer room economizer requirements. [suggested language PDF page 5-6]	Portions of the proposed language were included.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238288
238288.004	Codes and Standards Enhancement Team	For Exception 2 to Section 140.9(a)1, we recommend the following change: Do not include newly proposed Exception 2ii. Besides not indicating how much of the computer room cooling load is served, this exception may be difficult to enforce, and retaining Exception 2i with the updated language largely achieves the intent of this new item of ensuring the supplemental cooling from the building space conditioning system economizer is sized to provide a minimum level of computer room economizing. [suggested language PDF page 5-6]	This change was implemented.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238288
238288.005	Codes and Standards Enhancement Team	We recommend not including the newly proposed Exception 3 to Section 140.9(a)1 because: For computer rooms in jurisdictions not allowing (evaporative) cooling towers, there are other prescriptive economizer technologies that can be used to comply with Section 140.9(a)1 (e.g., air economizers), and there is also the option of computer rooms using air-cooled technologies such as air-cooled chillers with integrated economizers or dry coolers to comply with code via the performance path. [suggested language PDF page 5-6]	Exception i and iii were removed. This is because the inclusion or absence of cooling towers would not affect air economizers or refrigerant economizers.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238288
238288.006	Codes and Standards Enhancement Team	We recommend not including the newly proposed Exception 3 to Section 140.9(a)1 because: Including Exception 3ii may introduce confusion of what is an allowable economizer technology under Section 140.9(a)1. This exception specified that a dry-bulb ambient temperature is listed as a design temperature instead what is more appropriate temperature for designing evaporative water economizers namely the wetbulb temperature. There are several hydronic cooling systems for computer rooms that do not use evaporative cooling (e.g., air-cooled chillers with integrated economizers) and therefore do not meet the Title 24 definitions of water economizers per section 100.1(b). Listing the dry-bulb temperatures would only create confusion around what is meant by a water economizer. [suggested language PDF page 5-6]	Staff implemented the change suggested by the commenter.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238288

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238288.007	Codes and Standards Enhancement Team	We recommend not including the newly proposed Exception 4 to Section 141.1(b)1 because: Scenarios covered by Exception 4 would already be exempted by Exception 2 or Exception 3. [suggested language PDF page 5-6]	Staff implemented the change suggested by the commenter.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238288
238289.001	Jamie McDole (University Professional and Technical Employees, CWA Local 9119)	See TN# 238264.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238289
238296.001	Codes and Standards Enhancement (CASE) Team	After evaluating a broader range of design intents for Barber, Beauty Salon, Spa Area, and recognizing that these occupancies are not covered under the Tailored Method, the Statewide CASE Team recommends a moderate increase in the LPD in the 45-Day Express Terms but less than the LPDs in the 2019 Title 24, Part 6 Standards. [Suggested Language PDF page 7]	Staff have reviewed the Statewide CASE Team's recommendation for Barber, Beauty Salon, Spa Area, and determined the recommended changes to their respective LPD values are necessary.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238296
238296.002	Codes and Standards Enhancement (CASE) Team	The Statewide CASE Team is recommending that general lighting LPD be increased from 0.65 W/ft2 to 0.70 W/ft2 and the detailed task allowance from 0.20 W/ft2 to 0.30 W/ft2 and display/decorative allowance remain the same at 0.25 W/ft2 for a maximum allowable LPD of 1.25 W/ft2. The rationale is to allow "high end" designs for spas and the like where lighting is providing not only high light levels for beauty salon tasks, such as hair cutting and with high color rendering index for hair tinting, but also decorative and display lighting for illuminating artwork and with additional light sources, such as lights that are built into mirrors. [suggested language PDF page 7]	Staff have reviewed the analysis and its findings related to the lighting power allowance provision for Barber, Beauty Salon, Spa Area, and determined the recommended changes to their respective LPD values are necessary.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238296
238296.003	Codes and Standards Enhancement (CASE) Team	The revised lighting wattage allowance is proposed in lieu of having a Tailored Lighting Method approach for high end beauty salons.	Staff have reviewed the analysis and its findings related to the lighting power allowance provision for Barber, Beauty Salon, Spa Area, and determined the recommended changes to their respective LPD values are necessary.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238296
238300.001	Alan French (QTS Data Centers)	QTS agrees with the proposed changes that are under public review as is. We especially like that it raises economizer requirements from 40F to 50F. QTS would also like to stress the value of using a refrigerant based economizer over a water economizer, as using no water and will assist the emergency drought situation in California. - thanks much, Alan French, VP Engineering, QTS Data Centers.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/18/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238300
238301.001	Gordon Clint	Please require all-electric buildings in the 2022 code cycle. Buildings make up almost 40% of greenhouse gas emissions in the US and around 25% in California. The CA Energy Commission (CEC) has an opportunity, right now, to significantly lower climate pollution from the building sector by requiring all new construction to be all-electric in the 2022 energy code update. Partial electrification will not do enough to mitigate our climate crisis. Waiting three more years for the next energy code update would not only waste this opportunity to unleash a faster, more economical way to build housing in the Golden State, it would cost Californians \$1 billion in unnecessary, outdated gas infrastructure, and lock us into 3 million tons of additional carbon emissions by 2030.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238301

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238302.001	Rose Ann Witt	See TN# 237947.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238302
238303.001	Joan Edwards	Please vote to require all new bldgs to be all electric.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/19/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238303
238304.001	Kat Selm	To be a leader in the fight against the climate crisis, California must take more aggressive action in the building sector, as the building sector has the largest potential for significantly reducing GHG emissions. One of the most straightforward pathways to achieving emissions reductions in the building sector is through the decarbonization of new buildings, a finding corroborated by the CEC's Building Decarbonization Assessment. However, this is not the path your agency has decided to pursue in this code cycle despite the states 2045 climate goals	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238304
238304.002	Kat Selm	Waiting 3 more years before requiring new buildings to be all electric under title 24 will lock us into 3 million additional tons of CO2 by 2030. This is time that we cannot afford in battling this crisis, and emissions that could easily be avoided.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238304
238304.003	Kat Selm	The cost savings to builders and tenants of building decarbonization is also significant; E3's 2019 study, Residential Building Electrification in California, finds that across six different climate zones in California, the capital costs for all-electric single-family and low-rise multifamily buildings are cheaper than their natural gas alternatives.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238304
238304.004	Kat Selm	In addition to the climate impact, gas in homes and buildings can have numerous negative impacts on the health and safety of CA residents. A meta-analysis looking at the association between gas stoves and childhood asthma found children in homes with gas stoves have a 42% increased risk of experiencing asthma symptoms (Lin et al., 2013).	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238304
238304.005	Kat Selm	I urge you to do the right thing for California and require new buildings be all-electric in the 2022 code cycle.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238304

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238305.001	Clint Furtz	Buildings make up almost 40% of greenhouse gas emissions in the US and around 25% in California. You have an opportunity, right now, to significantly lower climate pollution from the building sector by requiring all new construction to be all-electric in the 2022 energy code update. Waiting three more years for the next energy code update would not only waste this opportunity to unleash a faster, more economical way to build housing in the Golden State, it would cost Californians \$1 billion in unnecessary, outdated gas infrastructure, and lock us into 3 million tons of additional carbon emissions by 2030. Please require all-electric buildings in the 2022 code cycle. We are in a climate emergency!	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238305
238306.001	Paul Wicoff (Burr Computer Environments)	BCEI is supportive of the following proposed 2022 Building Energy Efficiency Standards update as it relates to the use of refrigerant economizers for process cooling systems applied to computer rooms: Addition of pumped refrigerant economizers as a new economizer sub-type, with requirement of full economization for supply air temperatures of 65-80°F with outside air temperatures of 50°F or below	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238306.002	Paul Wicoff (Burr Computer Environments)	BCEI is supportive of the following proposed 2022 Building Energy Efficiency Standards update as it relates to the use of refrigerant economizers for process cooling systems applied to computer rooms: Addition of pumped refrigerant economizer requirements for computer rooms, requiring full economization at supply air temperatures up to 80°F and at outside air temperatures of 40°F dry bulb and below.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238306.003	Paul Wicoff (Burr Computer Environments)	BCEI has first-hand experience with the performance and reliability of refrigerant economizer-based systems and has found that they are uniquely suited for critical computer room cooling. Therefore, these should be assigned prescriptive performance requirements in the Building Energy Efficiency Standards.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238306.004	Paul Wicoff (Burr Computer Environments)	The proposed refrigerant economizer operational requirements included in Section 140.9.a.1.C promote increased energy efficiency without setting target performances that cannot be achieved. The temperature ranges fairly and adequately account for the supply air temperatures utilized in most computer room environments and for the heat transfer that can be reasonably expected from a refrigerant economizer heat rejection coil.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238306.005	Paul Wicoff (Burr Computer Environments)	Listing these requirements in the code will give building system engineers clear guidelines when selecting and comparing refrigerant economization-based cooling equipment. In turn, this will encourage equipment manufacturers to develop competitive, energy-efficient economizer solutions with a common benchmark of performance.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306

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238306.006	Paul Wicoff (Burr Computer Environments)	The proposed verbiage "or 35°F wet-bulb and below" in Section 141.1.b.1.C should be eliminated from this section. Integrated refrigerant economizers operate primarily based on ambient drybulb conditions and introducing a wet-bulb requirement could unreasonably restrict the use of these systems for computer room additions and alterations.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language - this renders the associated request to amend wet-bulb specifications moot. Staff nonetheless appreciates the comment of support for the proposed amendments, and invites stakeholder commenters to continue working with staff in pursuit of this topic.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238306.007	Paul Wicoff (Burr Computer Environments)	BCEI would like to request that the refrigerant economizer prescriptive performance requirements are not further increased in forthcoming editions of the energy code. Doing so would likely inhibit the use of the technology as it stands today, forcing the use of air- or water-side economization.	Staff notes that the proposed prescriptive refrigerant economizing provisions were ultimately not adopted based on extended discussion with stakeholders and a lack of consensus on the proposed regulatory language. Staff therefore would advise the commenter that future action is likely, and that their continued participation on this topic would be helpful.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238306.008	Paul Wicoff (Burr Computer Environments)	The potential problems of further forcing the use of air- or water-side economization could include: Being required to implement air-side economizers can risk sensitive server hardware operation. Many data centers are in locations subject to periodic low air quality. The air-borne particulates composing the above-mentioned pollutants are microscopic and are difficult to completely remove from the air stream. As a result, air-side economizers should only be used for computer room facilities known to house server equipment that can withstand damage caused by these particulates. Installation of airside economizers for data centers that house more sensitive equipment creates risk of physical server damage and accompanying customer outages.	Staff notes that economizing requirements are prescriptive requirements, meaning that systems can forego economizing by using performance-based compliance and achieving associated building performance targets where it is desirable to do so. Staff otherwise finds that economizing is a feasible and cost effective method of improving efficiency, and that inclusion as a prescriptive requirement remains appropriate.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238306.009	Paul Wicoff (Burr Computer Environments)	The potential problems of further forcing the use of air- or water-side economization could include: Being required to implement a water-side economizer can create significant demands on already stressed municipal and state water supplies. Most water-side economization occurs by evaporation of water to remove heat from a cooling system. For data centers, which can require cooling equal to many mega-watts, the overall evaporative flow rate can become extremely high. If more facilities are required to be designed with water-cooled economization, higher demand will be placed on already scarce water resources. This can cause supply and infrastructure issues for municipalities within the state, unnecessarily delay project delivery schedules, and risk existing data center operations.	Staff notes that economizing requirements are prescriptive requirements, meaning that systems can forego economizing by using performance-based compliance and achieving associated building performance targets where it is desirable to do so. Staff otherwise finds that economizing is a feasible and cost effective method of improving efficiency, and that inclusion as a prescriptive requirement remains appropriate.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238306
238307.001	Ann Feeney et al. (San Diego Building Electrification Coalition)	The SDBEC, along with hundreds of local and state environmental, public health, and government organizations have urged the California Energy Commission (CEC) to adopt strict all-electric building codes for some time now, but unfortunately, the newest CEC draft building codes fall well short of the all-electric target. We urge the commission to continue the State of California's climate leadership by adopting all-electric building codes for the upcoming 2022 cycle.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021		https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238307.002	Ann Feeney et al. (San Diego Building Electrification Coalition)	All-electric building codes are critical in meeting local and state-mandated Greenhouse Gas (GHG) reduction targets which are required to fight the existential threat we all face from the escalating climate crisis.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307

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238307.003	Ann Feeney et al. (San Diego Building Electrification Coalition)	It is well documented that using natural gas in the buildings we live and work in not only contributes over 10% of the State's total GHG emissions but adversely affects occupant health and well-being due to increased rates of respiratory illness, cardiovascular diseases, premature deaths and susceptibility to viruses.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238307.004	Ann Feeney et al. (San Diego Building Electrification Coalition)	The current draft proposal only requires one installed all-electric appliance and that buildings be pre-wired to be all-electric "ready" for most new construction. Although this is a step in the right direction, it still allows for natural gas infrastructure to be installed in these buildings. Unfortunately, this will "lock in" GHG emissions from these buildings for decades.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238307.005	Ann Feeney et al. (San Diego Building Electrification Coalition)	We are urging the CEC to adopt all-electric building codes since it is the best way to meet emission targets and improve the health of all Californians.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238307.006	Ann Feeney et al. (San Diego Building Electrification Coalition)	Going all-electric in new buildings will provide significant construction and operational cost savings. Research published by E3, a US energy consulting firm, has shown that construction costs can be reduced anywhere between \$1,500 and \$5,700 per unit depending on the type of building.	Thank you for the comment	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238307.007	Ann Feeney et al. (San Diego Building Electrification Coalition)	Operational costs can be reduced by up to \$100 per month when compared with natural gas burning appliances.	Thank you for the comment	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238307.008	Ann Feeney et al. (San Diego Building Electrification Coalition)	New high-paying jobs that will be created from the adoption of these codes. A UCLA study has found that electrifying California's buildings by 2045 would create 100,000 full time workers in the construction industry.	Thank you for the comment	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238307.009	Ann Feeney et al. (San Diego Building Electrification Coalition)	All-electric buildings do not pollute the indoor environment like fossil fuel appliances do, which dramatically improves indoor air quality and occupant health.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238307
238308.001	Alexandra Abrams	Thank you to the California Energy Commission's for working to shift the market toward clean, efficient all-electric new construction. These are vital steps towards addressing climate change and must be done. However, I believe we must go further than what is currently proposed to ensure the 2022 code removes unnecessary barriers to advancing clean and efficient all-electric construction: 1. Make heat pump water heaters (HPWH) the baseline for single-family in climate zone 10; 2. Expand the compliance incentive to system types most commonly used in large buildings; 3. The CEC should continue to enhance the compliance software to be able to model HVAC systems not currently supported, including systems commonly used in large buildings, and advanced heat pumps used in all types of buildings.	Staff concurs with the comment and have incorporated the suggestion concerning the performance baseline for single-family homes in climate zone 10. Staff will continue to develop software and alternative compliance methods that support builder design flexibility in buildings as part of ongoing software support.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238308

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238309.001	Tyler Abrams	We are in a climate emergency, and yet the CEC is taking an incremental approach to building electrification- a phased approach is not enough to prevent the worst effect of climate change and the CEC must be a bigger part of the solution. There are already many solutions/options available to consumers (residential and nonresidential), a phased approach is not needed	Staff appreciates the comment	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238309
238309.002	Tyler Abrams	Electric appliances are readily available to meet the needs of all-electric buildings. The 2022 code should have strengthened and expanded electric-ready requirements: Making new buildings electric-ready costs very little at the time of construction and will ensure that new homes fueled by gas will be able to affordably upgrade to electric appliances in the future.	Staff appreciates the comment	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238309
238309.003	Tyler Abrams	Waiting three more years for the 2025 update would cost Californians \$1 billion in unnecessary gas infrastructure, and lock them into 3 million tons additional carbon emissions by 2030.	Staff appreciates the comment	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238309
238309.004	Tyler Abrams	Compliance incentives that encourage efficient electric space and water heating: With heat pump baselines set to the largest energy user among space or water heating in each climate zone, the compliance incentive approach has the potential to result in rapid and large-scale adoption of clean electric technologies.	Staff appreciates the comment	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238309
238309.005	Tyler Abrams	Make heat pump water heaters (HPWH) the baseline for single-family in climate zone 10. Because heating is a relatively small load in climate zone 10, we support adjusting to a HPWH baseline to send a strong incentive toward decarbonization in this region.	Staff agrees with the comment and the adopted language reflected this change	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238309
238309.006	Tyler Abrams	Expand the compliance incentive to system types most commonly used in large buildings. Large non-residential buildings often use multi-zone, packaged, or central HVAC and HPWH systems, and there is currently no compliance incentive for the electric heat pump versions of these systems in the Express Terms. Expanding incentives to all system types is needed to shift all new construction to clean electricity, so there is no need to build new gas infrastructure that will become stranded before the end of its life. As a first step, we recommend that the CEC expand the electric baseline systems to all packaged units, such as rooftop units, including those that serve multi zone systems.	Expanding electric baselines to other building types will need to be part of a measure proposal that includes analysis of costs and benefits of the proposed prescriptive requirement change. Based on the proposal the requirements can be considered for future code cycles.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238309
238310.001	Faith Grant	California needs to move quickly to all electric as the state identifies ways to reduce the catastrophic effects of climate change. We don't have the luxury of waiting. By requiring new buildings to be all electric in the 2022 code cycle, we will be reducing tons of carbon and avoiding costly future re-modeling. Be bold and take the step to move to all electric in the 2022 code cycle.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238310

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238311.001	Ann Feeney	I urge the CEC to adopt a stricter, all-electric, code in the 2022 Energy Code. All-electric building codes are essential to meet both local and state-mandated GHG emission reduction targets. The climate crisis is spiraling out of control, and the IPCC and IEA have said we need to stop the use of fossil fuels as soon as possible. There are excellent electric alternatives to natural gas in buildings, such as heat pump water and space heaters and induction stoves. It is cheaper to build and to maintain an all-electric home compared to a mixed fuel home. Also, importantly, the burning of fossil fuels in homes is well documented to produce indoor air pollution, leading to increases in respiratory diseases, asthma, cardiovascular disease. So, for the health of occupants, and to address the climate crisis, please adopt an all-electric building code in 2022.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/20/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238311
238312.001	Philip Squair (National Electrical Manufacturers Association)	NEMA is concerned that while the CEC has claimed a desire for its Title 24 code development to be open and collaborative, final decisions about proposed regulatory language are often made without the benefit of informed public review, save the 45-day process.	Most measure proposals were developed by an outside party who generally held a number of public outreach opportunities to comment on their proposal. Additionally, the Energy Commission held several public workshops going over submitted measure proposals for the public to provide input on the specific measure proposal.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.002	Philip Squair (National Electrical Manufacturers Association)	Despite the time spent attending roundtable sessions intended to provide suggestions on how to simplify and improve the code language, it does not appear that the many improvements offered by our Members and others at those sessions have found their way into the subject proposed Express Terms.	Staff incorporated as many stakeholder-proposed clarifying changes as were found to be feasible and appropriate, noting that some of the suggestions submitted were substantive changes that would require completing cost impact analyses to consider.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.003	Philip Squair (National Electrical Manufacturers Association)	We stand by our previous comments, that dozens of changes proposed in the new 2022 code are not understood and have not been adequately explained. While perhaps done in spirit of reducing confusion, unexplained changes can tend to personal opinions and create more confusion as a result. By determining which "improvements" should be made in private, the rulemaking process for Title 24 is deprived of decades worth of subject matter expertise available from industry and the public.	Staff notes that, consistent with the Administrative Procedure Act (APA), all adopted amendments are accompanied by statements of their purpose and necessity, which explain both what the changes are and why they are needed. In addition, extensive public workshops and early drafts of proposed changes were provided during the pre-rulemaking period. Staff therefore disagrees with assertions that the changes are not explained or that the process was not transparent to the public. If you require further assistance, guidance, or explanation, please reach out to either the Building Standards Hotline or staff.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.004	Philip Squair (National Electrical Manufacturers Association)	Unlike the public Title 24 Stakeholders process run by the Investor Owned Utilities (IOU) Codes And Standards Enhancement (CASE) process, in the case of dozens of small changes in the subject proposal CEC staff apparently chose to work without the benefit of public input. Rather than maintain the potential for confusion that these privately developed changes might cause, we reiterate that proposals in the 45-day language that were not workshopped and which lack clear explanation should be pulled from this code cycle and submitted to a more proactive public process to ensure maximum beneficial outcome from these potential changes and a better, more understandable, outcome as a result.	Staff notes that, consistent with the Administrative Procedure Act (APA), all adopted amendments are accompanied by statements of their purpose and necessity, which explain both what the changes are and why they are needed. In addition, extensive public workshops and early drafts of proposed changes were provided during the pre-rulemaking period. Staff therefore disagrees with assertions that the changes are not explained or that the process was not transparent to the public. If you require further assistance, guidance, or explanation, please reach out to either the Building Standards Hotline or staff.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312

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238312.005	Philip Squair (National Electrical Manufacturers Association)	We continue to oppose the creation of some 130 added pages of proposed regulations in which CEC proposes to split requirements for high-rise residential structures and non-residential common areas of multi-family projects. While we understand some entities may have advocated for this change, as representatives of our customers who must ultimately conform to the code, these changes only seem to increase confusion.	Staff appreciates commenter's request for maintaining the existing organization of the Energy Code, though staff did not find that doing so would be responsive to the requests of other stakeholders. Staff notes that the change was requested in part by designers and builders of multifamily buildings, and that the prior distribution of provisions applicable to multifamily buildings throughout both residential and nonresidential chapters of the Energy Code was felt by said stakeholders to increase the risk of confusion, misapplication, and possible inadvertent conflict between organizationally residential and nonresidential requirements. Consolidation also allows staff to consider revising the division of "low rise" and "high rise" buildings, which would not be possible with the prior organizational structure. Staff therefore finds that the benefits of relocating these requirements into dedicated chapters can be reasonably anticipated to improve compliance with requirements and enhance transparency for designers, builders and code officials specializing in multifamily construction.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238312
238312.006	Philip Squair (National Electrical Manufacturers Association)	Without expressly stating it, CEC has created differing requirements between these previously harmonizes applications. For example, of three corrective comments submitted by a NEMA Member only one was acted on by CEC staff, leaving two disconnects. It appears that Commission staff intend to diverge the two sections.	Staff has clarified the application of residential and nonresidential lighting provisions within multifamily buildings, and improved the consistency in use of the term "common use area" (or "common area"). Staff has rephrased the allowance for residential-style lighting for areas providing dwelling functions into an exception, with clearer applicability. That said, staff's intent is consistent in ensuring that residential dwelling spaces can follow residential lighting design principles and not be forced to instead adhere to nonresidential principles, which is fully consistent with prior code requirements.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238312
238312.007	Philip Squair (National Electrical Manufacturers Association)	The formatting used in displaying changes in the 45-Day Express Terms does not adequately capture the modifications to the new (multifamily) section, making it very hard to distinguish differing requirements. To enable better review by those who must conform to and explain the code to others, Commission staff should clearly call these out in 15-day language, and do so in the proposal text itself not bury the explanations in supporting documentation like the Initial Statement of Reasons reference or other secondary document.	The formatting system of underline and strikethrough is required by the Administrative Procedure Act, State Building Standards Law, and California Building Standards Commission regulations regarding formatting. Staff notes that the Express Terms must, by definition, be a direct copy of the existing regulatory text and include only the express amendments proposed for that text in an underline and strikethrough format - it would be inappropriate to place the purpose and necessity statements present in the Initial Statement of Reasons or the technical and economic analysis present in the Documents Relied Upon within the Express Terms document in the manner suggested by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238312

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238312.008	Philip Squair (National Electrical Manufacturers Association)	In Section 130.1(c)8 allowances for the use of captive key card systems in hotels should be struck. These features are too-easily defeated, leaving it impossible to justify them on the ground of energy savings.	Some commenter support captive card key controls as an allowed means of controls, whereas some other commenter advocates to have it removed and perhaps to allow it under an exception for small hotels having 50 rooms or less. Staff disagree that the captive key card technology should be disallowed based on reports that a captive key card control was defeated by some user. Defeating a control mechanism is nothing new as it may happen to every control technology when some users decide to do so to serve their own good. More importantly, captive key card controls do save energy when it is used properly - similar to occupancy sensing controls and other automatic controls - that the controls turn off the power after a period of time the room has been vacated. (Same response to #112, 135 and 144)	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.009	Philip Squair (National Electrical Manufacturers Association)	In Section 130.1(d) the Commission should use the recommended power levels from the CASE Team, which is 75W instead of 120W as proposed in the 45-Day Express Terms. Conclusion: strike 120W from Exception 3 to Section 130.1(d) and replace with 75W.	Staff appreciate the comment submitted on a letter dated June 21, 2021. The suggestion change to the mandatory automatic daylighting controls requirement from the current lighting level of 120W to a new level of 75W is considered to be a significant change to the mandatory requirement. Even though the CASE Team was considering at one time during their daylighting measure development, they have not pursued further. As a result, the final version of daylighting CASE measure report was not revised. The Daylighting Control Threshold Analysis memo has not been submitted to the docket as a proposed change to the 45-Day Express Terms. As there are no further data provided in the comment other than citing what has been considered by the CASE team, staff conclude that there are not enough data to substantiate the change as suggested in the comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.01	Philip Squair (National Electrical Manufacturers Association)	We agree with the continuance of recognition of equivalency between Joint Appendix 8 and Title 20 qualified lamps for the purpose of conformance to Title 24. As stated in the Initial Statement of Reasons ⁴ , it was time for a "new generation of light source technologies for residential building lighting applications [to be] considered for their relevancy and physical characters". Understanding what products may or may not be used for a Title 24 compliant project can still be confusing. We suggest Commission staff provide guidance and examples of lighting products listed to Title 20 which must still meet JAB, perhaps through the Blueprint newsletter or in the Title 24 compliance manual after adoption of the standard.	Staff appreciate the support as stated in the comment. Title 24 Compliance Manual is published in every code cycle update and it contains guidance information for code users to understand the code requirements. Blueprint newsletters are another publication with focus on covering specific code subjects and are issued periodically thru out the year .	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312

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238312.011	Philip Squair (National Electrical Manufacturers Association)	In follow up to the preceding comment, for clearer recognition of products certified to the Title 20 Modernized Appliance Efficiency Database System (MAEDbS) we propose the addition of the words "Title 20 LED Lamps listed in the MAEDbS" or words to that effect, to Table 150.0-A.	The language about LED light sources in Table 150.0-A is reverted to the language of the 2019 Code. Based on stakeholders' comments in this rulemaking, the proposed JA8-exempted LED light sources and JA8 compliant LED light sources shall meet the same qualifications requirements and staff tend to agree with the comment and there is insufficient data to support the proposed JA8-exempted LED light source to be exempted from flicker reduction requirements. As such, staff recommend the language to be reverted so that the proposed JA8-exempted LED light sources shall meet the same qualification requirements of JA8 LED light sources. Title 20 LED lamps are one type of the proposed JA8-exempted LED light sources and they would still have to meet JA8. Hence the comment suggestion would not be valid and applicable.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.012	Philip Squair (National Electrical Manufacturers Association)	We agree with the changes made to Section 150.0(k)2F which lowered the threshold for dimming controls from 50 watts to 20 watts. The level of 50 watts was too high and would have essentially eliminated the requirement, causing a backslide in energy efficiency.	Staff appreciates the comment for supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.013	Philip Squair (National Electrical Manufacturers Association)	NEMA supports the comment filed by Mr. John McHugh of McHugh Energy on May 31, 2021 which opposes increasing the max wattage of Exceptions for parking lots to 78W. While we appreciate and agree with alignment to ASHRAE 90.1, these provisions have existed for several years and manufacturers and designs have accommodated them. There is no reason to relax these requirements. Exception 4 to Section 130.2(c)3 should be struck. Exception 4 to Section 160.5(c)2C should be struck.	It is evidential that more data is needed to evaluate the benefits vs the costs of the proposed change for the outdoor motion sensing controls requirements, staff recommends not to adopt any modifications in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C. (Same subject as in line item # 118 and 149)	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.014	Philip Squair (National Electrical Manufacturers Association)	Page 216pp the proposed replacement of the term "General" with "Controlled" is not an equivalent or clarifying measure. We do not interpret the change as a clarification. The term General should be maintained as it is better and more commonly understood.	"General lighting" is mentioned in the beginning and thru-out most of remaining section of the automatic daylighting controls section of 130.1(d). Also general lighting in applicable daylight zones are defined and specified for the automatic daylighting control requirements. Based on the above, staff do not find the comment to be valid.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.015	Philip Squair (National Electrical Manufacturers Association)	Pp221 item 3A(i), does not read well. The first part of the sentence talks about outdoor luminaires while the second part talks about outdoor lighting applications so "other than" doesn't make sense in the text. The words 'other than' in the sentence should be replaced with "not intended for", for sake of clarity.	Staff appreciates the comment and suggestion. Staff revised the meaning of the requirement in the adopted language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312
238312.016	Philip Squair (National Electrical Manufacturers Association)	Exception 3 to Section 110.12(c) refers to General Lighting Power of a space, but should instead refer to Design Lighting Power, as per the CASE report on this topic.	Both Section 110.12(c) and the Exception to it refer to "general lighting" and its reduction for meeting the demand responsive lighting controls. Based on the above, staff determine the proposed language of the Exception to Section 110.12 is consistent and correct to its intent.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312

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238313.001	Joe Hale	<p>Given the opportunity to once again comment on this document, for my confidential client refrigerant economizers have proven to be reliable and relatively trouble free compared to alternate technologies. Given matching supply air temperatures / cold aisle temperatures, restricting refrigerant economizer outside ambient limitations to those matching airside economizer is not really head to head. Refrigerant economizer systems do not use water to reject heat as do chilled water systems, and are not subject to outside air contaminants as are airside economizer systems. As such, I believe refrigerant economizer systems should be given relief as proposed by others regarding 100% cooling at ambient conditions.</p>	<p>Note that the pumped refrigerant economizer prescriptive options were not adopted due to additional analysis needed to show equivalent performance for refrigerant pump economizers.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/GetDocument.aspx?tn=238313</p>
238314.001	Stephen Wieroniewy (American Chemistry Council Spray Foam Coalition)	<p>The American Chemistry Council's Spray Foam Coalition1 (SFC) is pleased to provide comment on the California Energy Commission's (CEC) Title 24 – Part 6 – 2022 Express Terms and Reference Appendices. SFC commends the CEC for its ongoing efforts to improve energy efficiency of the thermal envelope, which is one of the most effective means to reduce greenhouse gas emissions from buildings. Reducing energy demand from heating and cooling buildings will help fight climate change and ease the transition to renewable energy. California is a leader in the fight against climate change and it is important for the state to ensure that Title 24 – Part 6 helps drive towards net-zero energy buildings.</p> <p>Improving energy efficiency by increasing insulation levels and the airtightness of buildings helps the state fulfill its broader environmental goals and provides energy savings to building owners. Considering energy efficiency during the design and construction of homes and commercial buildings will help keep residences and buildings affordable to own and operate. It is important for California to use Title 24 – Part 6 to help ensure builders are making appropriate decisions during the construction phase to help the state meet its climate goals.</p>	<p>Thank you for your comment. Staff would like to remind commenters that under the California Business and Professions Code, the Bureau of Household Goods and Service has exclusive jurisdiction to rate all insulation products in CA. Although the CEC specifies building energy efficiency standards, this function does not concern the efficiency of a building that is required, but rather the ability of a particular product to deliver a certain level of insulation. This comment is therefore properly directed to BHGS, rather than CEC. Staff are standing by and happy to help facilitate communication with BHGS staff upon request.</p>		45-Day	<p>https://efiling.energy.ca.gov/efiling/GetFile.aspx?tn=238314&DocumentContentId=71609</p>
238314.003	Stephen Wieroniewy (American Chemistry Council Spray Foam Coalition)	<p>Title 24 – Part 6 (2019) Appendix JA4 sets default R-values for open- and closed-cell SPF. The Appendix includes an option for SPF products to demonstrate higher R-values using an Evaluation Service Report (ESR) developed by International Code Council Evaluation Services (ICC-ES). Last year, the Coalition submitted a letter to CEC requesting that Appendix JA4 be amended to allow for the use of all Code Compliance Reports written by certified entities. Currently, spray foam systems houses are listing SPF products with several certified entities, including, but not limited to: IAPMO-ES, UL, Intertek, and Factory Mutual. SFC believes that all Code Compliance Reports should be able to use the current option to demonstrate higher R-values that is available to SPF products with ICC-ES reports.</p>	<p>Thank you for your comment. Staff would like to remind commenters that under the California Business and Professions Code, the Bureau of Household Goods and Service has exclusive jurisdiction to rate all insulation products in CA. Although the CEC specifies building energy efficiency standards, this function does not concern the efficiency of a building that is required, but rather the ability of a particular product to deliver a certain level of insulation. This comment is therefore properly directed to BHGS, rather than CEC. Staff are standing by and happy to help facilitate communication with BHGS staff upon request.</p>		45-Day	<p>https://efiling.energy.ca.gov/efiling/GetFile.aspx?tn=238314&DocumentContentId=71609</p>

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238314.004	Stephen Wieroney (American Chemistry Council Spray Foam Coalition)	The proposed changes to Appendix JA4 are problematic. The Bureau of Household Goods and Services2 (BHGS) listings only identify the R-value of SPF products at 1-inch of thickness. Appendix JA4 suggests that for other thicknesses one would multiply the 1-inch R-value by the thickness to get the installed R-value. This assumes the performance varies linearly; in reality, it does not. All Code Compliance Reports include a table that provides a list of R-values teste at various thicknesses in compliance with the Federal Trade Commission's R-value Rule. 3	Thank you for your comment. Staff would like to remind commenters that under the California Business and Professions Code, the Bureau of Household Goods and Service has exclusive jurisdiction to to rate all insulation products in CA. Although the CEC specifies building energy efficiency standards, this function does not concern the efficiency of a building that is required, but rather the ability of a particular product to deliver a certain level of insulation. This comment is therefore properly directed to BHGS, rather than CEC. Staff are standing by and happy to help facilitate communication with BHGS staff upon request.		45-Day	http://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.005	Stephen Wieroney (American Chemistry Council Spray Foam Coalition)	In Section 460.6, the FTC statesinsulation manufacturers must conduct R-value testing at "representative thicknesses" to ensure R-values do not vary more than 2% as thickness of the insulation increases. Therefore, it is important that SPF manufacturers conduct R-value tests at typically installed thicknesses and report appropriate R-values for those thicknesses. Calculating installed SPF R-values using the installed thickness and the R-value at 1-inch of thickness would not comply with the FTC's R-value rule.	Thank you for your comment. Staff would like to remind commenters that under the California Business and Professions Code, the Bureau of Household Goods and Service has exclusive jurisdiction to to rate all insulation products in CA. Although the CEC specifies building energy efficiency standards, this function does not concern the efficiency of a building that is required, but rather the ability of a particular product to deliver a certain level of insulation. This comment is therefore properly directed to BHGS, rather than CEC. Staff are standing by and happy to help facilitate communication with BHGS staff upon request.		45-Day	http://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.006	Stephen Wieroney (American Chemistry Council Spray Foam Coalition)	The SFC recommends the following changes to appendix JA4: Alternatively, the total R-value may be determined calculated based on the thickness of insulation multiplied by the "Tested R-value per inch" as listed listing in the Table of R-values or R-value Chart from the manufacturer's current code compliance report (CCR), developed by an Approved Agency (as defined in the California Residential Code, Title 24, Part 2.5) ICC Evaluation Service Report (ESR) that shows compliance with Acceptance Criteria for Spray-Applied Foam Plastic Insulation--AC377 per ICC 1100, Standard for Spray-applied Foam Plastic Insulation, or other applicable standards.	Thank you for your comment. Staff would like to remind commenters that under the California Business and Professions Code, the Bureau of Household Goods and Service has exclusive jurisdiction to to rate all insulation products in CA. Although the CEC specifies building energy efficiency standards, this function does not concern the efficiency of a building that is required, but rather the ability of a particular product to deliver a certain level of insulation. This comment is therefore properly directed to BHGS, rather than CEC. Staff are standing by and happy to help facilitate communication with BHGS staff upon request.		45-Day	http://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.007	Stephen Wieroney (American Chemistry Council Spray Foam Coalition)	SFC supports CEC's additional changes to Appendix JA4 that delete references to ICC-EC ESRs and insert "supporting documentation."	Staff appreciates the comment supporting the proposed amendment.		45-Day	http://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.008	Stephen Wieroney (American Chemistry Council Spray Foam Coalition)	The SFC believes that continuous air barriers and insulation are fundamental to improving the energy efficiency of the thermal envelope in new and existing buildings. Continuous air barriers provide direct energy savings by reducing or eliminating air leakage and can improve the performance of air permeable insulation products.	Thank you for your comment of support.		45-Day	http://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609

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238314.009	Stephen Wieroniewy (American Chemistry Council Spray Foam Coalition)	SFC supports CEC's proposal in the Express Terms that include more detailed prescriptive language for installing and testing for air barriers. Table 140.3-A lists characteristics for materials that can form part of an air barrier and are deemed to comply with Section 140.3(a)9B. Table 140.3-A states that medium density (closed-cell) SPF forms an air barrier at a minimum of 2-inches thick; and that low density (open cell) SPF forms an air barrier at a minimum of 5 1/2-inches thick. SFC believes that these thicknesses are reasonable for a generic reference. However, many commercially available medium density SPF products form code compliant air barriers at a thickness of 1-inch and many low density SPF products form code compliant air barriers at a thickness of 3 1/2-inches.	Staff appreciates the comment supporting the proposed amendment. The values in Table 140.3-A are provided as a simplified alternative to products "hav[ing] an air permeance not exceeding 0.004 cfm/ft2, under a pressure differential of 0.3 in. of water (1.57 psf) (0.02 L/(sec-m2) at 75 pa), when tested in accordance with ASTM E2178", per Section 140.3(a)9B. Products with improved performance can comply via their results from ASTM E2178 testing rather than by installing the thicknesses present in the table. Staff therefore finds that the table is appropriate as written, as an alternative to tested performance. See comment above in 238314.001.		45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.01	Stephen Wieroniewy (American Chemistry Council Spray Foam Coalition)	SFC recommends that Table 140.3A include a footnote instructing readers to reference Code Compliance Reports for product specific air permeance information. Code Compliance Reports include product specific air permeance testing (based upon ASTM E2178) and provide the product's installation instructions to form an air barrier.	Staff finds that this level of specificity would not be appropriate in the context of regulatory language. Designers and installers should in all cases rely on appropriate documentation and instruction from product and materials providers, including test reports documenting results determined according to specified test protocols.		45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.011	Stephen Wieroniewy (American Chemistry Council Spray Foam Coalition)	SFC supports the requirements for air tightness testing of buildings. The current wording in the draft language appears to suggest all buildings should be tested at 75 pascals depressurization. While this is the common pressure used to test materials and some assemblies, it is not the common pressure used to test houses and small buildings. Houses and small buildings are usually tested for air tightness at 50 pascals depressurization. The International Energy Conservation Code (IECC) requires air tightness testing at 50 pascals depressurization. The IECC sets air tightness requirements at 3.0 ACH50 for most climate zones We suggest presenting the testing requirements using 50 pascals depressurization.	Staff notes that Section 140.3 is expressly a section of requirements applicable to nonresidential buildings; staff finds that inclusion of residential standards in this section would create confusion and would not apply to buildings subject to this standard.		45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.012	Stephen Wieroniewy (American Chemistry Council Spray Foam Coalition)	Our key concern relates to how testing is being implemented. Section 140.3 of the Express Terms offers air tightness targets and provides an exemption if a building meets the air tightness requirements. The exemption allows builders to fix easily accessible air leaks without retesting for compliance with the air tightness threshold. The IECC has included airtightness requirements since 2009. Builders should be comfortable with the requirements and building in a manner that facilitates compliance with the air tightness requirements.	The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.		45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609
238314.013	Stephen Wieroniewy (American Chemistry Council Spray Foam Coalition)	The Express Terms include a prescriptive path for insulating at the floor or at the roofline of an attic to create a "high performance attic." Unfortunately, these "high performance attics" do not fully address air leakage at the floor of the attic or leakage from mechanical equipment and ductwork located in the attic. This undermines the energy efficiency of the buildings. Also, air permeable insulation that is not enclosed on all 6 sides is vulnerable to wind washing and convective air currents that undermine performance.	The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.		45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238314&DocumentContentId=71609

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238314.014	Stephen Wieroniey (American Chemistry Council Spray Foam Coalition)	We recommend that CEC create a third option for constructing "high performance attics." This third option would require the use of air impermeable insulation at the roof line and indirectly (passively) conditioning the attic space to create an "unvented attic" or "conditioned attic." This is consistent with the CEC definition of: "CONDITIONED SPACE, INDIRECTLY is enclosed space that (1) is not directly conditioned space; and (2) either (a) has a thermal transmittance area product (UA) to directly conditioned space exceeding that to the outdoors or to unconditioned space and does not have fixed vents or openings to the outdoors or to unconditioned space, or (b) is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour."	The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.		45-Day	http://efiling.energy.ca.gov/EFiling/Getfile.aspx?m=238314&DocumentGetfileid=71608
238314.015	Stephen Wieroniey (American Chemistry Council Spray Foam Coalition)	Creating an unvented attic by insulating and air sealing at the roofline also facilitates the ability to inspect and test air barrier continuity. It allows mechanical systems and ductwork to be brought within the boundary of conditioned space (or thermal envelope), which helps keep any leakage of conditioned air inside the thermal envelope. Finally, unvented attics create a more effective and continuous thermal envelope because the insulation and air barrier are not interrupted by duct penetrations, plumbing, wiring, and other services. Unvented attics are rapidly becoming one of the most popular insulation options for new home attics in many jurisdictions in the southern United States and it is one of the effective retrofit options for existing buildings.	The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.		45-Day	http://efiling.energy.ca.gov/EFiling/Getfile.aspx?m=238314&DocumentGetfileid=71608
238314.016	Stephen Wieroniey (American Chemistry Council Spray Foam Coalition)	Previously, CEC indicated that innovations like unvented attics were always available to builders using the "performance path" in the Title 24 – Part 6. However, in reality, this option is not as practical as CEC believes. There are several calculations built into the Title 24 compliance software (CBECC-Res) that lock in assumptions based on characteristics of other more common attic designs. We believe CEC needs to commit resources to ensure CBECC-Res properly models unvented attics. We thank CEC for their attention to this issue and would like to schedule a meeting with staff to continue our discussions to help improve CBECC-Res.	The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.		45-Day	http://efiling.energy.ca.gov/EFiling/Getfile.aspx?m=238314&DocumentGetfileid=71608

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238315.001	Bruce Naegel	<p>The latest revision of the 2022 building code is a start towards an all-electric future. However, we need to go all-electric now. It appears there are concerns on whether we are ready to go all electric. What signs do we have that we are ready?</p> <p>Scott Shell, a principal architect at architecture firm ehdd, has assembled a presentation highlighting all-electric buildings of all types. The presentation has grown over time and the current version from April of this year is enclosed. The presentation covers commercial, universities, schools, renovations, multifamily housing, labs and medical, restaurants and commercial food services. This presentation has grown over time, an indication more and more buildings are going all-electric.</p> <p>The presentation can be found here: https://drive.google.com/file/d/1BLgWDbk18toJSQjNDi5Y6GBBtm_Zu70s/view Buildings represent the</p> <p>All-electric buildings are important for the long-term survival of the planet. They get cleaner as the electricity gets cleaner. With 100% no carbon electricity, they become no carbon buildings.</p>	<p>CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238315&DocumentContentId=71610
238316.001	Spectrum Mechanical, Inc.	<p>Increasing the economizer temperature threshold for refrigerant economizers to 65 °F, as one commenter recommended, would detrimentally effect data center owners by forcing them to either install excess units, oversized equipment, or additional chilled water systems for the sole purpose of meeting the temperature threshold. It would not add overall efficiency to the system, and would in fact significantly increase water usage at data centers. Increasing the temperature thresholds beyond what is in the Draft Express Terms will make data center cooling systems significantly more costly. [...] I support the Draft Express Terms as written, and oppose any suggestion that the temperature threshold for refrigerant economizers be raised beyond 50°F at this time.</p>	<p>Based on feedback from stakeholders, including these comments, the Energy Commission declined to adopt the proposed pumped refrigerant economizer standards this standards cycle.</p>		45-Day	
238318.001	Thomas D. Culp, PHD, Birch Point Consulting	<p>Again, we want to thank the CASE teams and staff for all the hard work that has led to the proposed express terms for the 2022 energy code. We appreciate the iterative dialogue we have had with the teams. We have filed previous comments on a few items where we have minor disagreements in the proposed fenestration requirements, but these should not hold up the code, and we are supportive overall of the proposed fenestration changes for nonresidential buildings and in the new multifamily restructuring.</p>	<p>Staff appreciates the comment supporting the proposed amendments, and will be happy to continue working with the commenter on this issue in future code cycles following adoption of then proposed Express Terms.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238318&DocumentContentId=71613

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238318.002	Thomas D. Culp, PHD, Birch Point Consulting	<p>The one final item we do believe needs to be corrected is the removal of Exception 1 to Section 140.3(a)5B, which is actually a new requirement: EXCEPTION 1 to Section 140.3(a)5B: For school buildings less than 25,000 square feet and 3 stories or less in climate zones 1 and 16 shall have a U-factor of 0.26 or less.</p> <p>This exception came out of nowhere with no analysis, justification, or cost effectiveness – we could not find an analysis of this scenario in any of the CASE reports or anywhere else. Even for the colder climate zones 1 and 16, a U-factor of 0.26 is a drastic change, and simply not justified. For comparison, the nonresidential criteria range from U-0.34 to U-0.46 for different fenestration types, the relocatable school building requirement is U-0.47, and even the ZeroEnergy Advanced Energy Design Guide for K-12 School Buildings published by DOE, ASHRAE, AIA, IES, and USGBC only has U-0.34-0.36 for this region. We wonder if this was some sort of mistake or typo, as the only place the number 0.26 even shows up in the CASE reports is for SHGC, not U-factor.</p> <p>With no technical analysis or cost effectiveness, this exception does not comply with California code development procedures, and must be removed so that the main nonresidential requirements of Table 140.3-B apply.</p>	This exception was removed, consistent with the commenter's request.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238318&DocumentContentId=71613
238319.001	Girish Balachandran Silicon Valley Clean Energy	Silicon Valley Clean Energy (SVCE) strongly supports the California Energy Commission's (CEC) efforts to accelerate building decarbonization in the 2022 Energy Code Updated Rulemaking for residential and commercial buildings. Electrification of buildings is vital if California is to achieve its landmark 2030 and 2045 climate change goals.	Thank you for the comment of support	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238319&DocumentContentId=71614
238319.002	Girish Balachandran Silicon Valley Clean Energy	Title 24 updates that strengthen and expand the electric-ready building requirements and provide incentives for efficient electric space and water heating will help reinforce and support these local efforts. We strongly urge the CEC to transition towards a building code that is aligned with the state's climate targets by stopping the expansion of gas infrastructure and adopting an all-electric building code for both residential and commercial buildings to use the state's increasingly carbon-free electricity resources in 2022. An all-electric requirement for new construction in the 2022 building code cycle would enable our local governments to focus on the larger challenge of electrifying the existing building stock.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238319&DocumentContentId=71614
238320.001	QC Manufacturing	<p>On page 387 of the 2022 Standard this text on item #8: 8. When whole-house fans are required (REQ), only those whole-house fans that are listed in the Appliance Efficiency Directory may be installed.</p> <p>Strike out: "Appliance Efficiency Directory" Replace with: Home Ventilating Institute's Certified Products Directory</p> <p>So that this text lines up with new requirements on Section 150.1.12.</p>	Staff appreciates the comment. The adopted language incorporates the suggested edit.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238320&DocumentContentId=71615

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238321.001	Consol on behalf of Tri Pointe Homes	We are therefore disappointed to see that the Express Terms include language that would reduce our options for conditioned air distribution by effectively banning the use of uninsulated ducts in conditioned space. Section 150.0(m)1B, covering duct insulation requirements, would only allow uninsulated ducts in fully exposed locations, which is not a realistic option for obvious aesthetic reasons. The realistic option for uninsulated ductwork is for it to be run in cavities within the building thermal envelope. This currently requires insulation of R-4.2, which is reduced to R-3 or R-1 in the Express Terms. While this reduction will potentially reduce the cost of ducts run in conditioned space, the requirement for these ducts to be insulated at all is, we believe, unnecessary and unduly burdensome.	The 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?ui=238321&DocumentContentId=71616
238321.002	Consol on behalf of Tri Pointe Homes	There is no requirement for insulation on ducts in conditioned space in either the IRC or the IECC, and no US state requires ducts in conditioned space to be insulated. As a national builder, the need to change designs for the California market will impact our overall costs and our ability to deliver efficient houses to California customers.	The 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?ui=238321&DocumentContentId=71616
238321.003	Consol on behalf of Tri Pointe Homes	We recommend that rather than further limiting the use of uninsulated ducts, the language in the Express Terms should be amended to allow the unrestricted use of uninsulated ducts in the building's conditioned space. This can be simply achieved by amending Section 150.0(m)1B to read: "Portions of supply-air and return-air ducts and plenums of a space heating or cooling system outside of the buildings conditioned space shall be insulated to a minimum installed level of R-6.0"	The 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?ui=238321&DocumentContentId=71616
238322.001	AHRI	AHRI respectfully opposes the proposed revisions to the Energy Code that remove certain types of equipment—primarily equipment that utilizes natural gas—from the prescriptive compliance path and pose impermissible barriers to installing this same equipment under the performance compliance path (Proposed Revisions). The Proposed Revisions concern the energy use of products covered by the Energy Policy and Conservation Act (EPCA), 42 U.S.C. § 6201 et seq., and are therefore preempted by federal law. Accordingly, while the Commission's intention behind the Proposed Revisions may align with state goals, if enacted as written, the Proposed Revisions will be legally invalid.	Contrary to the comment, specifying equipment to be used for the prescriptive path does not exclude the use of natural gas equipment in new buildings. Natural gas equipment is still allowed under the performance pathway as long as the project performs equal to or better than the prescriptively designed building. The standards meet the seven criteria enumerated in Section 6297(f)(3) and are therefore not preempted by 42 U.S.C. Section 6297.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?ui=238322&DocumentContentId=71617

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238322.002	AHRI	The Proposed Revisions prohibit the use of several types of equipment, such as gas water heaters, furnaces, and boilers, under the prescriptive compliance approach by mandating the use of specific types of equipment in certain climate zones. For example, for single family residential buildings, the Proposed Revisions to Section 150.1(c)7 state that "[f]or climate zones 3, 4, 10, 13 and 14, the space conditioning system shall be a heat pump, or shall meet the performance compliance requirements of Section 150.1(b)1." Similarly, Proposed Revisions to Section 150.1(c)8 require the use of heat pump water heaters in several climate zones, with limited exceptions.1 All other products are therefore prohibited from using the prescriptive path to comply. The Proposed Revisions include similar mandates on the type of equipment that must be used under the prescriptive path for multi-family (low and high-rise) buildings. Additionally, in CZ 1 and 16, only dual fuel heat pumps can be installed under the prescriptive path for retail, grocery, and school building spaces.	The prescriptive requirements define what can be used under the prescriptive pathway and are used to define the energy usage of the baseline building used in the performance pathway. Under the performance pathway, other equipment not identified in the prescriptive pathway may be used as long as the project performs equal to or better than the baseline building and meets mandatory requirements. This would allow natural gas equipment to be installed under the performance pathway. Therefore, the revisions do not prohibit the use of covered products as the comment erroneously suggests.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238322&DocumentContentId=71612
238322.003	AHRI	By mandating the use of certain types of equipment, such as heat pumps, that do not utilize natural gas in certain climate zones, the Proposed Revisions ban the installation and use of gas water heaters, furnaces, and boilers under the prescriptive path in those climate zones.	Contrary to the comment, the standards do not mandate the use of certain types of equipment. The prescriptive requirements define what can be used under the prescriptive pathway and are used to define the energy usage of the baseline building used in the performance pathway. Under the performance pathway, other equipment not identified in the prescriptive pathway may be used as long as the project performs equal to or better than the baseline building and meets mandatory requirements. This would allow natural gas equipment to be installed under the performance pathway.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238322&DocumentContentId=71612
238322.004	AHRI	The Proposed Revisions to the performance compliance approach likewise prohibit the use of certain natural gas equipment, albeit less directly. Specifically, the Proposed Revisions would determine the energy budget for a Standard Design Building "by applying the mandatory and prescriptive requirements to the Proposed Design Building."3 This directly and inextricably incorporates the impermissibly stringent requirements of the prescriptive pathway into the performance pathway. Theoretically, a builder may use equipment prohibited under the prescriptive pathway, but it would be unable to meet the energy budget for the building without increasing energy efficiency elsewhere. Thus, the performance pathway effectively conditions the use of the prohibited equipment on the implementation of energy efficiency offsets.4	Contrary to the comment, the revisions do not prohibit the use of natural gas equipment. The prescriptive requirements are applicable to the projects complying under the prescriptive pathway. The prescriptive requirements are also used to create a baseline building that is used as a point of comparison through the performance pathway. Prescriptive requirements are not required to be used under the performance pathway proposed building design. It should be noted that under the performance pathway, as long as the equipment meets mandatory requirements and the proposed design performs as well or better than the baseline building, equipment other than those described in the prescriptive requirements can be used including natural gas equipment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238322&DocumentContentId=71612

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238322.005	AHRI	EPCA expressly preempts the Proposed Revisions because they constitute (1) regulations concerning the energy use of a covered product under 42 U.S.C § 6297(c), and (2) do not meet all seven requirements a building code must meet in order to avoid preemption under EPCA. 42 U.S.C § 6297(f)(3). Furthermore, EPCA preemption case law supports the conclusion that EPCA preempts the Proposed Revisions to the prescriptive compliance path and performance compliance path. Accordingly, if enacted as written, the Proposed Revisions will be legally invalid.	<p>Staff notes that, contrary to the comment, the adopted building standards do not mandate the use of any specific equipment, including heat pumps, or otherwise ban the installation or use of gas water heaters, furnaces, or boilers. Where the prescriptive compliance path provides a prescriptive option for installing a federally covered product type, that prescriptive path includes an option that permits the installation of minimally federally compliant products of that type. In addition, the performance compliance approach provides builders with the ability to specify equipment of their choosing, including minimally compliant federally covered appliances and equipment.</p> <p>The adopted building standards in the 2022 Energy Code therefore do not require builders to install federally covered products that are more efficient than federal standards. Staff has determined that the standards meet the seven criteria enumerated in Section 6297(f)(3) and are not preempted by 42 U.S.C. Section 6297(c).</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71617
238322.007	AHRI	The Proposed Revisions are regulations8 “concerning” the “energy use” of covered products because they relate to the amount of natural gas used by the products at issue. The Proposed Revisions mandate the use of certain equipment that do not utilize natural gas, such as heat pumps, in certain climate zones, thereby banning the installation and use of gas water heaters, furnaces, and boilers under the prescriptive path in those climate zones. Because the Proposed Revisions prohibit gas water heaters, furnaces, and boilers from using the prescriptive path to compliance in most circumstances, they necessarily reduce the quantity of natural gas used by those products to zero.	<p>Staff notes that, contrary to the comment, the adopted building standards do not mandate the use of any specific equipment, including heat pumps, or otherwise ban the installation or use of gas water heaters, furnaces, or boilers. Where the prescriptive compliance path provides a prescriptive option for installing a federally covered product type, that prescriptive path includes an option that permits the installation of minimally federally compliant products of that type. In addition, the performance compliance approach provides builders with the ability to specify equipment of their choosing, including minimally compliant federally covered appliances and equipment.</p> <p>The adopted building standards in the 2022 Energy Code therefore do not require builders to install federally covered products that are more efficient than federal standards. Staff has determined that the standards meet the seven criteria enumerated in Section 6297(f)(3) and are not preempted by 42 U.S.C. Section 6297(c).</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71617
238322.008	AHRI	The fact that the Proposed Revisions to the prescriptive compliance path include limited exceptions (e.g., the limited exception for the use of gas instantaneous water heaters in climate zones 3, 4, 10, 13, and 14 under Section 150.1(c)7) and a performance path to compliance is irrelevant to whether the Proposed Revisions are preempted. The Proposed Revisions to the prescriptive path are regulations concerning the energy use of covered products, regardless of the existence of exemptions or the availability of the performance path to compliance. Under EPCA, a regulation does not need to prohibit the energy use of covered products to be preempted in all circumstances; it merely has to concern the energy use of covered products, and the Proposed Revisions to the prescriptive path to compliance do just that.	While it is true one threshold element of federal preemption under EPCA involves the question of whether regulations “concern” energy use or efficiency, as defined by federal law, it is not the only operative element. Staff has analyzed both the relevant law and the proposed amendments and concluded that the adopted building standards meet the seven criteria enumerated in EPCA for express exemption from preemption.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71617

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238322.009	AHRI	The Proposed Revisions to performance pathway similarly exceed the minimum levels of efficiency established by DOE. Under EPCA, the Standard Building Design must be based on products that meet but do not exceed the federal energy efficiency standards. 42 U.S.C. § 6297(f)(3)(D). The Proposed Revisions run afoul of this requirement because they embed the impermissible prohibitions of the prescriptive pathway into the energy budget for the Standard Design Building. Conditioning the use of EPCA-covered products on the implementation of energy efficiency offsets does not permit a builder to select products that meet, but do not exceed, federal energy standards	Contrary to the comment, the proposed 2022 Energy Code performance pathway was specifically set at levels that allow federally-covered products, including natural gas equipment, to still be installed at federal standards and satisfy the performance standard. Based on this and staff's analysis, staff has concluded that the adopted building standards meet the seven criteria enumerated in EPCA for exemption from preemption, and therefore the standards are not preempted.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71617
238322.01	AHRI	The leading case addressing the above EPCA provisions, Air Conditioning, Heating and Refrigeration Institute v. City of Albuquerque, supports the conclusion that EPCA preempts the Proposed Revisions to the prescriptive compliance path. (Please see cited lawsuit reference in support of this comment.)	Thank you for the comment. Based on staff's analysis, staff determined that the standards meet the seven criteria enumerated in Section 6297(f)(3) and are not preempted by 42 U.S.C. Section 6297(c).	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71617
238322.011	AHRI	CEC has the burden to ensure the Proposed Revisions meet EPCA's seven statutory requirements for exemption from preemption. CEC has not attempted to demonstrate the Proposed Revisions satisfy EPCA's exemption requirements and, indeed, cannot do so because the Proposed Revisions fail to meet at least two of these seven requirements. As such, the Proposed Revisions do not qualify as exempt from EPCA preemption. (Please see comment on lawsuit reference as well as further commentary regarding the seven statutory requirements).	Staff has determined that the standards meet the seven criteria enumerated in Section 6297(f)(3) and are not preempted by 42 U.S.C. Section 6297. Therefore, no change was made in response to this comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71617
238322.013	AHRI	AHRI agrees with CEC's assessment that moving to an all-electric baseline in 2022 is premature.12 On January 26, 2021, CEC correctly identified that neither the market nor the workforce is ready to support electric-only new construction. Technicians installing and servicing heat pumps must be trained to the latest of both technical and professional standards. Title 24 is also not ready for policies limiting a consumer's choice to freely select equipment regardless of energy used. Rather than regulations preventing the use of energy sources for space and/or water-heating, CEC should focus on financial incentives for reducing carbon emissions through policies that encourage the installation of equipment that reduces carbon emissions and structural updates that reduce the amount of energy needed for space- and/or water-heating. It is imperative that CEC preserve the flexibility for equipment to use any energy source when it is more practical, economical, and environmentally beneficial to do so. For example, the future benefit of Hydrogen or Hydrogen blends distributed in the natural gas system allows for the utilization of excess, non-peak electricity to be stored in the system by creating Hydrogen gas for later use. Research is ongoing.	Staff notes that the Energy Code does allow for the use of various energy sources through the performance compliance pathway and does not require or force electric-only new construction. Staff also notes that updates to the Energy Code are not mutually exclusive with building efficiency incentive programs such as those overseen by the CPUC. Staff has determined that pursuing State energy policy as described in the Integrated Energy Policy Report through the vehicle of revisions to the Energy Code is appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71617

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238322.014	AHRI	<p>First, commercially available desiccant systems will be available prior to Title 24-2022 coming into force. To more clearly permit desiccant dehumidification in HVAC systems, AHRI recommends modification to INTEGRATED HVAC SYSTEM:</p> <p>INTEGRATED HVAC SYSTEM is an HVAC system designed to handle both sensible and latent heat removal. Integrated HVAC systems may include, but are not limited to: HVAC systems with a sensible heat ratio of 0.65 or less and the capability of providing cooling, dedicated outdoor air systems, single package air conditioners with either at least one refrigerant circuit providing hot gas reheat or a desiccant dehumidification system, and stand-alone dehumidifiers modified to allow external heat rejection.</p>	Requirements imposed by the Energy Code involve established technologies for which a strong technical record exists. Novel technologies, or technologies for which available data is inadequate to support a decision to legally require the use of that technology, can still be modeled via the performance approach, including through the alternative compliance method process. Staff welcomes a submittal concerning desiccant systems with supporting data for the 2025 Energy Code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612
238322.015	AHRI	<p>Secondly, AHRI recommends a modification to the DX-DEDICATED OUTDOOR AIR SYSTEM UNITS definition to acknowledge that the product is not always supplied with a means to reheat dehumidified air.</p> <p>DX-DEDICATED OUTDOOR AIR SYSTEM UNITS (DX-DOAS)- a type of air-cooled, water-cooled, or water-source DOAS unit that dehumidifies 100 percent outdoor air and may include reheat capable of controlling the supply dry-bulb temperature of the dehumidified air to the designed supply air temperature.</p>	The proposed definition for DX-DOAS aligns with ASHRAE, and staff has determined that the proposed language by staff is appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612
238322.016	AHRI	AHRI is concerned with the introduction of gasketing requirements in Section 120.1(c)(1)(D). The draft language presents unintended compliance concerns for systems installed in Nonresidential and Hotel/Motel Buildings. This new section requires filter racks to be gasketed or sealed to eliminate any air from bypassing the MERV 13 filter. While the intent of language proposed seems to be designed to ensure that equipment operates as intended, we see three issues with compliance: (1) there appears to be no tolerance for the requirement; (2) it is unclear how the requirement would be enforced; and (3) for side-loaded filters, which are common for packaged commercial equipment, gasketing the filter rack to completely remove all gaps will end up crushing/crimping the filter itself.	Staff appreciates the comment and addressed it by revising the language for filter gasketing in the 15-day language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612
238322.017	AHRI	Regarding compliance, in the April 9, 2021, comments 13 to the pre-rulemaking, the Home Ventilation Institute (HVI) requested clarification on two scenarios to confirm compliance with gasketing and sealing requirements. "Scenario A: A filter with a flat surface is held against another flat surface with pressure applied by a gasket or seal from the opposite surface. For example, a square cardboard filter squeezed against the bottom of an EPS insulated housing filter slot of a supply only ventilation device by a compressible sealing material on the opposite surface (e.g., within the access door)." And "Scenario B: A filter with a tight fit on at least 4 edges of the perimeter is installed against a hard, flat surface." These are likely scenarios in equipment to support air filter functioning as designed to protect occupants from exposure to small airborne particles; however, by use of the word "eliminate" an impossible equipment configuration has been created.	Staff appreciates the comment. Staff addressed this comment by revising the language for filter gasketing in the 15-day language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612

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238322.018	AHRI	AHRI recommends that this requirement be modified as follows, "If an available equipment option, filter racks or grilles shall be specified to include any available gasket or seal technology that reduces air bypassing the filter. EXCEPTION 1: Gasketing on side-load filter racks are exempt." This would ensure that the designer specify an option, if available for the configuration of the equipment. Code officials would be able to review the mechanical drawings for this requirement and request equipment cut sheets, if necessary, to enforce. Further, specifying a reduction, rather than an elimination of airbypass will improve the condition without creating an impossible requirement. Further, it clearly exempts equipment configurations that cannot comply. For equipment that cannot be specified with a gasket, there appear to be gasketed filters on the market for consumers to purchase. The above analysis and recommendations also apply to Sections 150.0(m)12Bv and 160.2(b)1Bv, Air Filtration and System Design.	Staff appreciates the comment. Staff addressed this comment by revising the language for filter gasketing in the 15-day language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238322&DocumentContentId=71617
238322.019	AHRI	Firstly, AHRI appreciates CEC harmonizing with ASHRAE 90.1 and implementing a fan energy index (FEI) minimum of 0.95 for VAV.	Staff appreciates the supportive comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238322&DocumentContentId=71617
238322.02	AHRI	Secondly, AHRI appreciates modifications to EXCEPTION 1 to Section 120.10(a) to more clearly exclude equipment currently in the process of first-time federal regulation, for example, computer room air conditioners (CRAC) and dedicated outdoor air systems (DOAS). However, AHRI retains concerns regarding both consumer confusion regarding the application of the requirement to equipment without final rules and the application of FEI to embedded fans, discussed below. Despite the clear intent of DOE to issue energy conservation standards for this equipment, there is no guarantee that CRAC and DOAS will have final rules published by January 1, 2023, when Title 24-2022 goes into force.	Staff appreciates the supportive comment and addressed the concerns raised by including the recommended changes to clarify the application of the requirement in the 15-day language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238322&DocumentContentId=71617
238322.021	AHRI	While an exception to Section 120.10(a)2, that FEI values for embedded fans do not need to be third party verified is appropriate, AHRI recommends instead clearly exempting embedded fans. Embedded fans cannot be accurately and comparably rated using AMCA 208. Section 4.4 of AMCA 208-18 and Annex D (informative) includes the entirety of calculation methods for embedded fans. It is not written in mandatory language and cannot be used reliably to rate embedded fans with an FEI. Neither consumers nor regulators are able to determine which products have inextricably embedded fans and which do not. AHRI strongly urges CEC to exclude all embedded fans – there is no consistent, clear, uniform, repeatable, and reliable method to determine the FEI of an embedded fan.	Staff does not agree to exempt all embedded fans. The proposed FEI requirements are modeled after national standards, IECC and ASHRAE, where not all embedded fans are exempt. No changes were made.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238322&DocumentContentId=71617

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238322.022	AHRI	While AHRI supports the conceptual change to regulating fan system input KW instead of fan bhp, we have some concerns with the proposed regulatory text. Most importantly, based on a simplified analysis using motor power, the Fan Power Budget language, as proposed, is overly stringent – much more so than the proposal introduced to ASHRAE 90.1, particularly for certain application. The stringency varies considerably by unit size and without modification, this proposal stands to eliminate larger commercial packaged air conditioners and heat pumps (rooftop units or RTUs) from the California market. ¹⁶	Staff have worked with AHRI and stakeholders to resolve this comment regarding stringency and relaxed the requirements in the adopted language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612
238322.023	AHRI	As CEC is aware, manufacturers are already well into the redesign process to bring RTUs into compliance with the January 1, 2023, DOE efficiency standards. ¹⁷ To bring a product line to market to address new regulatory requirements, not only must the product be redesigned, but it must also be retested, have its components recertified, and the entire product must be recertified to safety and efficiency standards.	Thank you for your comment. CEC staff are aware of the product development cycle and timelines that product manufacturers face. In order to help accommodate this, CEC staff strive to provide a high degree of advance notice and transparency in Commission rulemakings, so that, along with the statutory triennial code development cycle, manufacturers have ample time to adjust their product development processes to accommodate new regulation.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612
238322.024	AHRI	We recognize that products are not compliant or non-compliant in and of themselves; however, if they cannot comply at the customers' required external static pressure requirements, then the products essentially are non-compliant. AHRI members will supply data directly to CEC outlining the proposal impact on products. Larger fans and cabinets are also problematic on replacement applications. The proposal allows for extra fan power on replacement applications intended to account for existing ductwork deficiencies, but that extra power is almost entirely consumed by the pressure drop induces by a curb adapter – a necessary component on many replacement projects. If replacement rooftops require completely new support structure, rather than a curb adapter, then the cost to building owners will be significant. This cost has not been accounted for in the CASE	Staff determined that the adopted language appropriately put requirements on designers to design better ducts and that designers would require less external static pressure due to the proposal. Staff welcomes data regarding proposals and will consider any further data for the 2025 code cycle. Staff appreciates the second portion of this comment. Staff agree with the difficulty for replacements for existing buildings and have revised the proposal back to allow 2019 values for additions and alterations. The metric has changed in determining compliance, but the equivalent credit from the 2019 code for additions and alterations have been converted to this new metric. Doubling the fan power allowance would make compliance less stringent than the current 2019 code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612
238322.025	AHRI	These comments also apply to the proposal included in Section 170.2, which addresses high rise residential buildings. While AHRI is not opposed to the introduction of new sections to address multifamily buildings if this change helps designers, builders, and code officials, we are concerned with the possibility for diverging requirements in future editions of Title 24. If any of AHRI's proposed revisions to Section 140.4(c) are not made to Section 170.2, AHRI requests that CEC maintain and make public a table to track conflict/divergence between sections of similar requirements.	Staff determined that the adopted language appropriately put requirements on designers to design better ducts and that designers would require less external static pressure due to the proposal. Staff welcomes data regarding proposals and will consider any further data for the 2025 code cycle. Staff does not prepare documents comparing the requirements between nonresidential and multifamily buildings, but will continue to work with stakeholders to navigate requirements.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612
238322.026	AHRI	Section 140.4(e) proposes the reduction of the economizer threshold to apply to equipment from 54,000 Btu/h to 33,000 Btu/h. While requirement appears to offer energy savings, we question how cost effective it would be in practice. AHRI's concerns persists regarding (1) cost effectiveness with the proposed decoupled DOAS when paired with terminal equipment such as variable refrigerant flow (VRF), water source heat pumps, and small chilled-water coils; and (2) the limitation of implementation options with certain types of equipment, mainly VRF.	Based on staff's analysis, staff determined that the analysis provided by the CASE team established that the primary pathway is cost effective and appropriate. VRF and other efficient systems have the option to take the economizer trade off table or the performance path. Therefore, no change was made in response to this comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238322&DocumentContentId=71612

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238322.027	AHRI	Economizers were designed to be implemented on outdoor equipment, whereas challenges exist in indoor implementation. AHRI would not oppose limiting the requirement to extend economizer requirement down to 33,000 Btu/h if it was only applied to outside units. AHRI requests CEC to remove the proposal to require economizers on indoor fan coils and limit the expansion economizer requirements to outdoor products.	Based on staff's analysis, staff determined that the analysis provided by the CASE team established that the primary pathway is cost effective and appropriate. VRF and other efficient systems have the option to take the economizer trade off table or the performance path. Therefore, no change was made in response to this comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238322&DocumentContentId=71617
238322.028	AHRI	AHRI supports the data center proposal as written in the Express Terms for the 2022 Energy Code, Title 24 Parts 1 and 6. The inclusion of refrigerant economizers as an additional prescriptive requirement reinforces the technology-neutral intent of Title 24.	Thank you for the comment. Based on feedback from stakeholders, staff concluded that it appropriate to continue refining the appropriate regulatory language and metrics in the 2025 code cycle. For this reason, staff recommended to not adopt language regarding pumped refrigerant economizers, and none were adopted in the 2022 cycle. Staff is continuing to work with stakeholders with regard to this issue for the 2025 code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238322&DocumentContentId=71617
238322.029	AHRI	If CEC were to introduce into 15-day comments the proposed federal-preempted energy efficiency minimums for refrigerant economizer in the CASE team comments,20 it would constitute a breach of the APA. The introduction of new energy efficiency minimums for these products would not be reasonably foreseeable based on the NOPA and is therefore a substantial change requiring the publication of another 45-day notice in the Notice Register. Thus, without sufficient opportunity for stakeholder engagement, CEC should not include the energy efficiency minimums for refrigerant economizers at this late stage in the process.	Thank you for the comment. Based on feedback from stakeholders, staff concluded it appropriate to continue refining the appropriate regulatory language and metrics in the 2025 code cycle. For this reason, staff recommended to not adopt language regarding pumped refrigerant economizers, and none were adopted in the 2022 cycle. Staff is continuing to work with stakeholders with regard to this issue for the 2025 code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238322&DocumentContentId=71617
238322.03	AHRI	AHRI appreciates the CEC addressing the concern raised during the public hearing, Section 150.0(j)1 regarding the potential conflict with the federal standard for unfired hot water storage tanks (UFHWST). The federal energy efficiency standards for UFHWST are established with an insulation of R-12.5. AHRI agrees with CEC's response that insulation wrap is a longstanding Title 24 requirement and does not conflict with federal efficiency standards as proposed language does not prevent use of an R-12.5 federally rated tank or require manufacturers to supply an insulation wrap as the requirement applies to additional insulation added by the installer. However, we were unable to locate justification for increasing the wrap to R-16 in the CASE report. This change will yield only a small benefit, when calculated using time dependent valuation (TDV), perhaps not enough to cost justify the burden of the installation. AHRI recommends CEC reexamine increasing the stringency of the insulation wraprequirement.	The 2022 proposed edits updated the external insulation blanket R-value to account for the current DOE standard for internal tank insulation, resulting in a reduction in the historical requirement if only insulation blankets are used to comply. We have thoroughly assessed the legality of the 2022 Energy Code, and have concluded our standards are not preempted.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238322&DocumentContentId=71617

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238322.031	AHRI	<p>In new Section 150.0(o)1K, CEC has proposed to ban the use of atmospherically vented or solid fuel burning appliances installed inside the pressure boundary in single family, multifamily dwelling, and attached dwelling units less than 1,000 sqft of floor area. California homeowners in smaller homes will no longer be able to install the most common type of residential gas water heaters, an atmospherically vented furnace or water heater, a pellet stove, or even install a wood-burning fireplace. During the public hearings, CEC explained that this code change has been proposed because of the increase in minimum kitchen range hood airflow rate requirements. CEC also stated that higher airflow on the kitchen exhaust creates the possibility of backdraft. The CASE report²¹ does not indicate if the prohibition on atmospherically vented appliances was due to safety or energy concerns. AHRI requests that CEC reconsider implementing measures that would ban the use of federally compliant appliances in buildings.</p>	<p>Staff agree with the comment and this language was deleted in the adopted language.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238322&DocumentContentId=71612</p>
238322.032	AHRI	<p>Lastly, AHRI suggests it would be easier for stakeholders to review code changes and for builders to comply with indoor air quality requirements if relevant sections from ASHRAE 62.2 were included in Title 24, rather than readers being required to purchase the standard. It is not possible to assess the code proposal, "all dwelling units shall meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to amendments specified in Section 150.0(o)" without having purchased ASHRAE 62.2. Likewise, a builder would be unable to comply with mandatory requirements in Title 24 without having purchased this standard.</p>	<p>The Energy Standards adopts sections of ASHRAE 62.2 by reference with some of the language incorporated explicitly, usually with amendments. Currently, CEC has copied and pasted applicable sections of ASHRAE 62.2 into the residential compliance manual for public use, and the same will be done for the 2022 Standards.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238322&DocumentContentId=71612</p>
238322.033	AHRI	<p>Section 150.1(c)6 (and Table 150.1-A COMPONENT PACKAGE – Single-Family Standard Building Design) includes existing requirements for new construction space conditioning systems that CEC has proposed extending to replacement systems through new section 150.2(b)1G. These requirements appear to impact electric resistance heating included in heat pumps. It is common for strip heat to be installed as emergency backup in the event the heat pump becomes inoperable during the heating season.</p> <p>During the May 24 public hearing, CEC staff confirmed the intent of the language in these sections are not to prohibit electric resistance heat in heat pumps; however, AHRI remains concerned that the language may need clarification to clearly exclude heat pumps. We request that CEC revisit the language proposed in Section 150.2(b)1G (and 180.2(b)2Av in the new multifamily section). If this situation is not remedied, the inadvertent elimination of resistance heat and strict reliance on the heat pump could result in systems oversized in cooling and without proper redundancy.</p>	<p>Section 150.2(b)1G has been revised to address this comment for the 15-day. Staff did not intend for this requirement to apply to strip heating in heat pumps. It only applies to electric resistance as the primary heat source.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238322&DocumentContentId=71612</p>

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238322.034	AHRI	Secondly, nearly all manufactured housing heating systems are electric furnaces. Duct work in mobile homes are too small to allow a regularly sized furnace to be installed or safely used. CEC staff confirmed during the May 24 public hearing that complicated ties exist between Title 24 and CCR Title 25 - Housing and Community Development. AHRI requests the CEC staff investigate and confirm that the proposed revisions in Section 150.2(b)1G will not prohibit the replacement of electric resistance heating systems in manufactured housing	Section 150.2(b)1G includes three exceptions where existing electric resistance heating can be replaced by another electric resistance heating system.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238322&DocumentContentId=71617
238322.035	AHRI	During the May 27 public hearing, CEC noted that a 15-day edit will be added to clarify, "that new systems serving additions can be a heat pump or gas heating system." AHRI looks forward to reviewing this proposed change. During the hearing, CEC clarified that the 15-day language will also include an option for gas instantaneous water heating equipment to be used in multifamily additions. AHRI encourages CEC to also include an option to allow gas water heaters for new systems serving additions. There are cases where the gas line would need to double in size to accommodate a new instantaneous gas water heater and a gas water heater would be the most cost-effective solution.	The adopted language include gas instantaneous water heaters prescriptive options for addition for single family and multifamily. Staff further notes that gas storage water heater can be used under the performance compliance pathway.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238322&DocumentContentId=71617
238322.036	AHRI	CEC should remove barriers to the installation of space heat pumps AHRI recommends CEC evaluate certain provisions within Title 24 to further increase the adoption of space heat pumps. Residential Appendix Rated Heat Pump Capacity Verification, RA 3.4.4.2, imposes requirements for verification of system performance are based on 350 cfm per nominal ton; however, AHRI has consistently advocated that instead, these requirements should be based on rated capacity. The 350 cfm per nominal ton minimum airflow requirement is not an accurate representation of airflow rates at which systems operate.	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 produce lines, and is easily enforced as it is possible to know the nominal airflow rate based on the building conditioning loads without referring to specific manufacturer documentation or ratings. At the time the certificate of compliance is completed the manufacturer make and model of equipment is unlikely to have been determined for the project. 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.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238322&DocumentContentId=71617
238322.037	AHRI	AHRI urges CEC to address the artificially low performance required when modeling variable capacity heat pumps (VCHP) in the Alternative Calculation Method (ACM) Reference Manual and the residential California Building Energy CodeCompliance (CBECC-Res) performance compliance software used for demonstrating compliance with the Performance Standards specified in Title 24, Part 6, Section150.1(b). CEC responded to five years of AHRI advocacy by adopting modest credits for heating and cooling; however, modeling ductless heat pumps as barely more efficient than a split system equivalent to the standard design with default duct conditions (minimum efficiency) is misrepresentative and presents a barrier to California consumers adopting more efficient technologies. CEC should consider permitting the use of rated efficiencies for these products in the ACM and CBECC-Res performance compliance software program.	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking. Development of supporting software and related guidance documents are still underway for the 2022 code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238322&DocumentContentId=71617

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238322.038	AHRI	Lastly, in response to CEC's recent Flexible Demand Appliance Standards December 14, 2020, stakeholder workshop, 24 AHRI noted that harmonization with industry standards, such as AHRI Standard 1380 (I-P/2019): Demand Response through Variable Capacity HVAC Systems in Residential and Small Commercial Applications (AHRI 1380), will allow manufacturers the ability to produce heat pumps for a broader market. Again, AHRI urges CEC's efforts be geared towards incentivizing the adoption of DR-products (e.g., performance compliance credits) and to not limit product availability for consumers.	The Energy Commission may look into additional DR credits as products become available. These credits would need to go through the appropriate evaluation process before being included. Staff welcomes stakeholders to submit proposals for the 2025 code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?he=238322&DocumentContentId=71612
238322.039	AHRI	ASHRAE 90.1-2019 includes updates to Table 6.8.1-7 Performance Requirements for Heat Rejection Equipment—Minimum Efficiency Requirements, adding requirements for dry cooler minimum efficiency and test procedures. The 90.1 addendum was made in response to a consensus proposal from ASHRAE TC8.6, Technical Committee for Cooling Towers and Evaporative Condensers, Subcommittee on Standards and Codes. The minimum efficiency for axial fan, air cooled fluid coolers, better known as dry coolers, has been added to the Table using CTI ATC-105DS, Acceptance Test Code for Dry Fluid Coolers, as the test standard. No significant, measurable economic impact was anticipated based on the introduction of these updates to ASHRAE 90.1, and likewise, we do not expect adverse economic impact if harmonized requirements are introduced into Title 24. The introduction of the Test Code will assist purchasers of dry coolers confirm the actual rated capacity that was specified in their system design. Therefore, AHRI recommends CEC update TABLE 110.2-G PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT to completely harmonize with ASHRAE 90.1-2019, as follows:	Some of these additions have been made to the performance requirements in Section 110.2. This includes adding the efficiency information for propeller or axial fan dry coolers.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?he=238322&DocumentContentId=71612
238322.04	AHRI	In the same table, AHRI notes the addition of footnote "c" from ASHRAE 90.1 is required to be added as well. It reads: For purposes of this table, dry cooler performance is defined as the process water flow rating of the unit at the given thermal rating condition divided by the total fan motor nameplate power of the unit and air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the total fan motor nameplate power of the unit.	A definition for dry cooler has been added and a footnote was added to the table.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?he=238322&DocumentContentId=71612
238323.001	Anne L Kelly, Ceres	We are encouraged by the steps taken by the California Energy Commission (CEC) to incentivize building electrification in the Express Terms and see the 2022 Title 24 update as an opportunity for California to shift the market towards all-electric new construction. The steps that the CEC is taking to accelerate this transition are critical to maximizing progress in the building sector and avoid locking-in carbon intensive buildings for decades to come. It is important that the Commission keeps this ambition in the final regulation and looks for opportunities to further incentivize the transition towards all-electric buildings.	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?he=238322&DocumentContentId=71618

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238323.002	Anne L Kelly, Ceres	All-electric appliances for space and water heating have the potential to create substantial long term cost savings by avoiding the addition of new gas lines to buildings and related infrastructure costs. As noted in our previous comments, ratepayers will bear the cost for investments in gas infrastructure that California has already indicated that it plans to phase out. If the state plans to phase out natural gas, it is important that ratepayers are not left paying for stranded assets and/or that building occupants are not required to later pay for retrofits that were otherwise avoidable. We appreciate that the Express Terms include strengthened and expanded electric-ready requirements for appliances. We strongly encourage the CEC to maintain these details in the final standard and to look towards full electrification in future versions of the standards.	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238323&DocumentContentId=71618
238323.003	Anne L Kelly, Ceres	We also support the advancement of standards that enable market transformation, including compliance incentives that encourage efficient electric space and water heating. This approach would enable large scale and rapid adoption of electric technologies, while continuing California's climate leadership. Again, we appreciate that the draft standard includes this incentive-based approach and strongly encourage the CEC to maintain these details in the final standard.	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238323&DocumentContentId=71618
238324.001	California Lighting Technology Center	Stairwell exemption Respectively the exemption for shut controls in stairwells should be removed. Exception 6 to §130.1(c)1 Shut Off Controls for Egress Stairwells: Lighting in stairways provided that the stairway is designated for means of egress on the plans and specifications submitted to the enforcement agency under Section 10- 103(a)2 of Part 1. Bi-level controls for stairwells should be maintained in the California building code.	Some stairways maybe designated as a means of egress, and the Energy Code has included a provision for a portion of the stairwell lighting designated for means of egress to be exempted from the automatic shutoff controls requirements. Also, bi-level controls for stairwell lighting can provide a level of lighting during occupied and unoccupied period, and stairwell could be designed to be lit at all times - fully lit or dimmed. Based on the above, staff did not adopt the proposed language of "Exception 6 to §130.1(c)1" about shut off controls for egress stairwells and deleted Exception 6 from the adopted language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?m=238324
238324.002	California Lighting Technology Center	We were surprised to see this exemption for automatic shut off that effectively removes sensor-based control systems for this application. Bi-level sensor-based stairwell lighting systems have proven to provide significant energy savings, cost effectively in many building types across California. Previous research conducted at the California Lighting Technology Center clearly demonstrated 50% + savings with a very high level of reliability. Many universities and colleges across California have implemented this highly cost-effective approach to save energy and have not reported any issues related to inadequate illumination.	Some stairways maybe designated as a means of egress, and the Energy Code has included a provision for a portion of the stairwell lighting designated for means of egress to be exempted from the automatic shutoff controls requirements. Also, bi-level controls for stairwell lighting can provide a level of lighting during occupied and unoccupied period, and stairwell could be designed to be lit at all times - fully lit or dimmed. Based on the above, staff did not adopt the proposed language of "Exception 6 to §130.1(c)1" about shut off controls for egress stairwells and deleted Exception 6 from the adopted language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?m=238324

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238324.003	California Lighting Technology Center	<p>Bi-level to 50% is more than adequate to maintain safety egress light levels and we have yet to see any safety or related issues in all of the college deployments. Since our original research, statewide demonstrations, and the subsequent title 24, the lighting industry has broadly adopted this bi-level sensor based technology and many commercial systems are available in the marketplace.</p> <p>The original research on this was funded by the California Energy Commission - PIER program and was one of the first projects that Art Rosenfeld asked us to pursue ~2001 as an opportunity to reduce the amount of wasted energy inside buildings during vacancy. These original studies showed that stairwells are typically unoccupied yet fully illuminated for very long periods of time making this bi-level lighting approach a particularly attractive strategy. This is now becoming an urgent priority given the significant savings opportunity during evening hours with the potential of addressing the emergent duck curve issue. Technologies and approaches like Bi-level stairwell lighting that provide large savings during the evening hours should be considered a very high priority for the Energy Commission.</p>	<p>Some stairways maybe designated as a means of egress, and the Energy Code has included a provision for a portion of the stairwell lighting designated for means of egress to be exempted from the automatic shutoff controls requirements. Also, bi-level controls for stairwell lighting can provide a level of lighting during occupied and unoccupied period, and stairwell could be designed to be lit at all times - fully lit or dimmed. Based on the above, staff did not adopt the proposed language of "Exception 6 to §130.1(c)1" about shut off controls for egress stairwells and deleted Exception 6 from the adopted language.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238324
238324.004	California Lighting Technology Center	<p>If California is to address climate change through greenhouse gas mitigation we need to be more aggressive at encouraging deep energy savings. Please consider restoring the bi-level automatic shut off for stairwells.</p>	<p>Some stairways maybe designated as a means of egress and the Energy Code has included a provision for a portion of the stairwell lighting designated for means of egress to be exempted from the automatic shutoff controls requirements. Also bi-level controls for stairwell lighting can provide a level of lighting during occupied and unoccupied period, and stairwell could be designed to be lit at all times - fully lit or dimmed. Based on the above, the Commission opted not to adopt the proposed language of ""Exception 6 to §130.1(c)1"" about shut off controls for egress stairwells.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238324

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238325.001	QC Manufacturing Inc., And	<p>Prior to 2019 code HERS verifications, the following airflow derating s are being applied to the WHF models prior to the cfm/watts being sent to the physics engine:</p> <ul style="list-style-type: none"> • Airflow Degraded by +60% based on the assumption that only 1/3 of homeowners will open windows for cooling purposes. <p>In addition to the above software degradations applied to WHF airflow, the addition of 2019 code HERS resulted in a 3rd degradation of airflow:</p> <ul style="list-style-type: none"> • Airflow degraded by 67% if no HERS verification is applied to the performance model. <p>Using the above computations, a model for a 2000 sq ft home, with a proposed WHF of 3000cfm, will be derated as follows:</p> <p>1 st derating: 3000 * .60 = 990 CFM</p> <p>2 nd Derating 990 * .33 = 327 CFM</p> <p>The resulting airflow CFM of 327 cfm is 5-ton sent to the physics engine for computations to evaluate the cooling AC offsets of the whole house fan. This mathematically implies to the physics engine that if no HERS test is performed, the home will be receiving only 1/10th of the airflow rate and cooling power of the whole house fan, and this is mathematically not correct,</p>	<p>This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking. Evaluation of supporting software will continue as ongoing effort.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238325&DocumentContentId=71620
238326.001	Anthony Serres (Signify)	<p>130.1: The language "within 20 minutes of the control zone being unoccupied" is ambiguous. Within 20 minutes would suggest a time of less than 20 minutes, but not equal to 20 minutes. Our understanding is that the requirement for occupancy time out is 20 minutes or less so we suggest that this language be modified in every instance in the code, so it is clear that the time out permitted is a maximum of 20 minutes.</p>	<p>The word "within" could have two meanings; one is "before the end of" and another is "in the range of". Staff agreed that it could be worded differently to avoid confusions. For this reason, staff revised the language to delete the word "within" in the adopted language.</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?m=238326
238326.002	Anthony Serres (Signify)	<p>130.1(a)1: We support the exemption of public areas from the manual control requirements. This change supports common practice.</p>	<p>Staff appreciates the comment supporting the proposed amendments.</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?m=238326
238326.003	Anthony Serres (Signify)	<p>Exception 6 to 130.1(c)1: We support the exception to shut-off controls for lighting in stairways if the stairway is formally designated a means of egress. This change supports common practice.</p>	<p>Some stairways maybe designated as a means of egress, and the Energy Code has included a provision for a portion of the stairwell lighting designated for means of egress to be exempted from the automatic shutoff controls requirements. Also, bi-level controls for stairwell lighting can provide a level of lighting during occupied and unoccupied period, and stairwell could be designed to be lit at all times - fully lit or dimmed. Based on the above, staff did not adopt the proposed language of "Exception 6 to §130.1(c)1" about shut off controls for egress stairwells and Exception 6 was deleted from the adopted language.</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?m=238326

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238326.004	Anthony Serres (Signify)	130.1(c)6: We support the proposed requirements for general lighting in open offices to be controlled with occupant sensing controls. We suggest a better solution would be include the proposed requirements for all "open plan offices" and not limit them to 'office spaces greater than 250 square feet'. 'Open plan office' is a recognized industry term in lighting and architecture and lighting and other building systems are often designed around applicability for use in open plan offices (e.g. style of office) rather than according to size.	Staff appreciates the comments. Having a size specificity for the occupancy sensing controls for the open plan offices - office spaces greater than 250 square feet - provides a guidance on the scenario that the requirement would apply. Without a size specificity, it could be confusing to the industry, code users, designers and building officials, and it could likely occur that two persons would have a different interpretation choices of how big an open office should be when the code does not specify one for open offices or large offices. Based on the above, staff concluded a size specificity for open offices is necessary for the proposed requirement of multi-zone occupancy sensing controls for large offices. Staff rejected the comment suggestion and the proposed language was kept as-is that the requirement is for office spaces greater than 250 square feet.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238326
238326.005	Anthony Serres (Signify)	130.1(d)3c: We oppose this change. Replacing "general" with "controlled" is not clear because the two terms are not equivalent. General lighting and controlled lighting do not necessarily mean the same thing. We suggest that the text remain as it is in the 2019 code because it was clear.	"General lighting" was mentioned in the beginning and throughout most of remaining section of the automatic daylighting controls section of 130.1(d). Also, general lighting in applicable daylight zones was defined and specified as part of the mandatory automatic daylighting controls requirements. "Controlled lighting" was used in two subsections of 130.1(d), and they were used in the context of as part of the automatic daylighting control system. Staff determined that the usage of the term "controlled lighting" is unambiguous in this context and appropriate. No change was made to the code language in response to this comment.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238326
238326.006	Anthony Serres (Signify)	130.2(c)3A(i): For clarity, we suggest the words 'other than' in the sentence be replaced with "not intended for". The first part of the sentence talks about outdoor luminaires while the second part talks about outdoor lighting applications so "other than" does not make sense in the text.	Staff appreciates the comment and revised the language to clarify the requirements of §130.2(c)3A(i) consistent with the comment.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238326
238326.007	Anthony Serres (Signify)	150.0(k)1B: We are happy to see the inclusion of Title 20 compliant LED lamps as an option for screw-based luminaires. We applaud this commonsense change that only requires Title 20 compliance (and removes additional JA8 requirements) for lamps. The California Energy Commission's pace- setting Title 20 LED lamp requirements, which have been in effect since Jan 2018, have consistently delivered high quality, high performance energy efficient products to the market and we are glad to see them gaining further acceptance within Title 24. This change eliminates additional labelling and certification requirements for lamp manufacturers and makes it easier to develop and deliver energy efficient products to address the needs of the California market.	The language about LED light sources in Table 150.0-A was reverted to the language of the 2019 Code. Based on stakeholders' comments in this rulemaking, as well as the fact that there was insufficient data in the record, staff determined that the proposed JA8-exempted LED light sources and JA8 compliant LED light sources should meet the same qualifications requirements. As such, staff reverted the language so that the proposed JA8-exempted LED light sources meet the same qualification requirements of JA8 LED light sources. Title 20 LED lamps were one type of the proposed JA8-exempted LED light sources, and they will still have to meet JA8. Hence, the comment suggestion would not be valid and applicable. For these reasons, no change was made to the energy code language in response to this comment.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238326

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238326.008	Anthony Serres (Signify)	<p>150.0(k)1B: The proposed text seems to require JA8 compliance for lamps that are not "general service lamps", including state-regulated LED lamps and small-diameter directional lamps. We request that the California Energy Commission extend entry 5 in table 150.0-A to include all Title 20 compliant LED lamps as high efficacy lamps and remove the words "as general service lamps".</p> <p>We also request that recessed downlights (#10 in Table 150.0-A) be moved to the high efficacy column.</p>	<p>The language regarding LED light sources required to certify to JA8 in Table 150.0-A was reverted to the language of the 2019 Code, based on commentary from other parties and as explained in the response to Signify's prior comment. As this language was reverted to retain the prior scope of application of JA8, the language that the commenter is requesting be extended to more types of lighting no longer exists, and no further edits were made by staff in relation to this comment.</p> <p>Separately, staff finds that even if the proposed changes to Table 150.0-A were retained, extending the allowance for general lighting to all lighting regulated by Title 20 would not be appropriate. The Title 20 regulations applicable to general service lamps very closely follows JA8 requirements. Title 20 regulations and standards applicable to other types of lighting are not as closely aligned, and the intent of the originally proposed change was to streamline areas where the requirements were highly similar. Staff would not find extending the proposed allowance to lighting with dissimilar T20 requirements to be appropriate.</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238326
238327.001	Avery Ray Colter, FARD Engineers	I hope the CEC and others observing the comments can move to act on the idea in the included link as soon as possible. Covering our irrigation canals with PV modules and building out infrastructure from there can accomplish several objectives, providing power for many rural and farming areas of the state without the environmental hazards of land uses elsewhere (and possibly qualifying as a source of community PV for Title 24 compliance in nearby communities), deeply mitigate uncontrolled evaporation of precious canal water, and even reduce maintenance costs for the canals themselves as photosynthesis-dependent algae and plants will have less fuel for aquatic incursions. It sounds like a promising solution to many of the land use points raised by advocates of maintaining the natural gas grid. https://pvbuzz.com/installing-solar-panels-over-california-canals/	Staff notes that this comment does not relate to the proposed code amendments included in this rulemaking. Staff invites the commenter to submit a complete code change proposal on this topic, so that it is able to be considered in the next regular rulemaking proceeding.	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?tn=238327&DocumentContentId=71621
238332.001	Daikin U.S. Corporation	Daikin supports the Commission's efforts to accelerate building electrification and decarbonization through the improvements made to Title 24, Part 6, to help the state meet its greenhouse gas (GHG) reduction goals. Daikin believes that heat pumps are the proven technology to achieve substantial GHG reduction in both residential and nonresidential buildings and appreciates that Section 150.1(c)7 sets prescriptive baselines to mandate the installations of either air-source heat pumps ("heat pumps" hereinafter) or heat pump water heaters (HPWHs) in each climate zone.	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238332&DocumentContentId=71629
238332.002	Daikin U.S. Corporation	Daikin is unclear about how the cost-effectiveness was calculated and how heat pumps and HPWHs were allocated to each climate zone as its baseline. Therefore, Daikin is concerned that the section likely undermines the performance of heat pumps in the given space heating applications, observing the zone allocations.	The rationale for the heat pump baseline is laid out in the report "Heat Pump Baseline for Non-residential and High-Rise Residential Buildings" TN 238849. The goal for this rulemaking is to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238332&DocumentContentId=71629

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238332.003	Daikin U.S. Corporation	Daikin believes that Section 140.4(e) of CEC Title 24 45-day language proposes a modification to the economizer requirement by lowering the air handler cooling capacity threshold from 54,000 Btu/h to 33,000 Btu/h. As a result, air handlers of commercial HVAC systems with cooling capacity greater than 33,000 Btu/h will require an economizer installation. Exception 6 to Section 140.4(e)1 addresses air handlers with cooling capacity less than 54,000 Btu/h coupled with a dedicated outdoor air system (e.g. DX-DOAS, HRV or ERV) for ventilation in accordance with 140.4(p)1B and 140.4(p)2 through 140.4(p)6. This exception does not address air handlers with cooling capacity greater than 54,000 Btu/h. Several variable refrigerant flow (VRF) air handlers (hereinafter referenced as "indoor units") have cooling capacities greater than 54,000 Btu/h. Therefore, Daikin is also concerned about the new provision[.]	The proposed language is intended to not include systems >=54kbtu. This is intentional since current 2019 language requires all units with cooling capacities >=54kbtuh to install economizers. Including an exception for 54kbtuh would roll back stringency.			
238332.004	Daikin U.S. Corporation	Daikin believes that the baseline allocations to heat pumps undermine the heating performance of heat pumps. In Section 150.1 (c)7, new prescriptive requirements for heat pumps were added for climate zones 3, 4, 10, 13, and 14. In addition, climate zone 10 is expected to switch to HPWHs in the 15-day language proposal. NRDC submitted a wholesale base cost comparison of a baseline code-compliant gas furnace/AC system and a heat pump system to the pre-rule making docket, and the comparison presents that the former is 14% more expensive than the latter. The gap increases to 29% in regions of the state where ultra-low NOx furnaces are required, including the South Coast and San Joaquin Valley air districts. In addition, the comparison states that installation cost "would typically be higher for gas appliances due to the installation of three, instead of two, pieces of equipment, as well as venting and installation of a second fuel type." This study alone suggests that heat pumps should be considered as baselines at least in all regions that do not require cold climate heat pumps or gas furnaces; in other words, heat pumps should be qualified for climate zones 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, and 15.	The rationale for the heat pump baseline is laid out in the staff report "Residential Electric Baseline" TN 238850. The goal for this rulemaking is to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. Staff acknowledge that cold climate heat pump are available, and can be used under the performance compliance method.			
238332.005	Daikin U.S. Corporation	Daikin believes a major barrier to heat pump adoption is the market's reliance on air conditioners (ACs) for cooling and gas furnaces for heating. As such, creating pathways to phase away from cooling-only ACs by instead requiring heat pump condensing units, supports both the effective and transitional use of gas furnaces in dual fuel scenarios, and boosts the install base of heat pumps to support the long term decarbonization goals. This approach can be accommodated and effective in all climate zones in California. Daikin also believes that cold-climate heat pumps can sufficiently provide space heating in all regions in California. Therefore, Daikin suggests that Section 150.1 (c)7 should require the use of dual-fuel or cold-climate heat pumps in climate zones 1, 2, 11, and 16.	The rationale for the heat pump baseline is laid out in the staff report "Residential Electric Baseline" TN 238850. The goal for this rulemaking is to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. Staff acknowledge that cold climate heat pump are available, and can be used under the performance compliance method.			

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238332.006	Daikin U.S. Corporation	Section 170.2(c)3Ai notes that the system should be a heat pump for climate zones 1 through 15 and a gas furnace/AC system for climate zone 16, where the building has three or fewer habitable stories. Daikin suggests that the use of dual-fuel or cold-climate heat pumps for climate zone 16 should be required in such buildings.	The analysis for lowrise multifamily is the report "All-Electric Multifamily Compliance Pathway" TN 234888. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace. Cold-climate HP can be used under the performance method			
238332.007	Daikin U.S. Corporation	Section 170.2(c)3Aii notes that the system should be a heat pump for climate zones 2 through 15 and a dual-fuel heat pump for climate zones 1 and 16, where the building has four or more habitable stories. Daikin suggests that the dual-fuel heat pump should remain as the baseline for climate zones 1 and 16 in such buildings, and that the baseline can be substituted with the use of a cold-climate heat pump.	The analysis for lowrise multifamily is the report "All-Electric Multifamily Compliance Pathway" TN 234888. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace. Cold-climate HP can be used under the performance method			
238332.008	Daikin U.S. Corporation	For Section 140.4, which defines the prescriptive requirements for space-conditioning systems in nonresidential buildings, a gas furnace/AC system is required in Retail and Grocery Building Spaces in climate zones 1 and 16 as well as in Office, Financial Institution, and Library Building Spaces in climate zone 16 when the cooling capacity is less than 65,000 Btu/hr. Daikin suggests that the gas furnace/AC systems be removed from the prescriptive system type for this section, and that dual-fuel heat pumps be set as the prescriptive system type, while also allowing the substitution of cold-climate heat pumps.	The rationale for the heat pump baseline is laid out in the report "Heat Pump Baseline for Non-residential and High-Rise Residential Buildings" TN 238849. The goal for this rulemaking is to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace. Cold-climate HP can be used under the performance method.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238332&DocumentContentId=71629
238332.009	Daikin U.S. Corporation	in the same section (140.4), a dual-fuel system is set as the prescriptive system type in Retail and Grocery Building Spaces in climate zones 1 and 16 as well as in Office, Financial Institution, and Library Building Spaces in climate zone 16 when the cooling capacity is greater than 65,000 Btu/hr. A dual-fuel system is also set as the system type in School Building Spaces in climate zones 1 and 16. [...] Daikin suggests that this section be modified to allow a cold-climate heat pump to be used as the substitute for a dual-fuel heat pump.	The rationale for the heat pump baseline is laid out in the report "Heat Pump Baseline for Non-residential and High-Rise Residential Buildings" TN 238849. The goal for this rulemaking is to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace. Cold-climate HP can be used under the performance method.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238332&DocumentContentId=71629
238332.01	Daikin U.S. Corporation	Imposing an economizer requirement for VRF indoor units raises significant and severe installation barriers. Typically, VRF indoor units are categorized as either: (1) ducted indoor units; or (2) non-ducted (i.e. ductless) indoor units. [...] For ducted indoor units, the ductwork is often limited with little-to-no ducting for return or supply air within a single zone. For ductless indoor units, return air and supply air are passed through the indoor units without any ductwork. [...] VRF ductless indoor units are physically unable to incorporate the use of economizers.	Staff appreciates the comment. This proposal's primary pathway is not VRF. VRF are able to be installed with a DOAS, take economizer trade offs for more efficient systems, or comply using the performance pathway.			
238332.011	Daikin U.S. Corporation	[E]conomizer installations with VRF ducted indoor units would lead to an increase in: (1) penetrations in the building roof and/or walls; (2) ductwork; and (3) system power input. These ducted indoor units are generally installed in their intended space conditioning zone, which may not be close to the building perimeter walls. Therefore, economizer installations with ducted indoor units present considerable complexities. [...] [T]he estimated differential in installation cost between the two sample layouts can go up to 5X.	Staff appreciates the comment. This proposal's primary pathway is not VRF. VRF are able to be installed with a DOAS, take economizer trade offs for more efficient systems, or comply using the performance pathway.			

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238332.012	Daikin U.S. Corporation	[T]he efficiency and effectiveness of certain VRF systems may be impacted due to the use of economizers. VRF systems with heat recovery modules facilitate exchange of energy between different individual space conditioning zones to provide simultaneous cooling and heating, thereby increasing energy use effectiveness. The use of economizers compromises this energy recovery from individual zones, therefore preventing a system from delivering that same level of effectiveness and efficiency.	Staff understands the concept of heat recovery between spaces by 'pumping' refrigerant and welcomes data from manufacturers to account for this efficiency in it's standards. These systems are able to utilize the economizer trade off table, use the exception with DOAS, or comply with the performance approach. Staff welcomes stakeholders to provide a proposal with analysis to exempt these systems from economizing.			
238332.013	Daikin U.S. Corporation	[W]e request the CEC consider modifying Exception 6 to 140.4(e)1 to include all VRF indoor units, including units with cooling capacity > 54,000 Btu/h. Alternatively, we support the proposed approach outlined in the AHRI comments on 2022 Title 24 45-day language to limit economizer requirements to only outdoor systems (i.e. indoor units inside building spaces should be exempt from using economizers).	Staff disagrees with comment. Current VRF systems with a capacity of >=54kbtuh require economizers in current code and including all VRF would reduce stringency of the standards.. VRF has multiple options to be installed to avoid economizer requirements.			
238332.014	Daikin U.S. Corporation	Outside air can be brought into VRF space-conditioned zones via a direct method, integrated method, and decoupled DOAS method. These approaches have their own advantages and disadvantages, and the choice is generally application and space-dependent. The 45-day language currently allows for decoupled DOAS method with space-conditioning systems to be exempted from the economizer requirements. For regions (climate zones) and applications that do not need 100% dedicated outside air to be brought into the space-conditioning zone, we request the CEC to consider providing an option for use of other approaches to bring in outside air, such as the direct or integrated outside air method.	VRF systems that utilize the direct method or integrated method are able to utilize the economizer trade off table, take the exception for decoupled DOAS using efficient fans, or they can be installed via the performance pathway.			
238333.001	Hari Lamba	The current proposal for the 2022 Building Code must be strengthened and include an all-electric baseline for all building types. Such an inclusion will be more protective of our climate and public health. If California is to meet its declared energy and climate goals, total building electrification is a must. CEC must begin to align itself with these goals. Not only must EVERYTHING be electrified that can be, including retrofits, but CEC should begin planning on how to meet this added electrical energy demand through renewable energy, and battery and green hydrogen systems! www.brighterclimatefutures.com	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238333&DocumentContentId=71627
238335.001	Jim Stewart	As a member of several of the 60+ organizations that sent you letter on June 18, I strongly support an All-Electric Building Code in 2022. You need to adopt this not only because of the urgency of the climate crisis, but because of the health and fire dangers of allowing gas to continue in homes. Please protect our health and climate. Thank you.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238335&DocumentContentId=71644

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238336.001	Priscilla Lane	We are in a climate emergency, and yet you are taking an incremental approach to building electrification. There are electric appliances readily available to meet the needs of all-electric buildings and the indoor air pollution produced from gas stoves is hazardous to health, and is associated with increased asthma, cardiovascular disease and other health risks, especially in children. Waiting three more years for the 2025 update is simply too long to wait. Please act now to update the building code to require that all new buildings be all-electric. Thank you.☺	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238336&DocumentContentId=71642
238337.001	Eric Truskoski, Bradford White Corporation	<p>Section 150.0(j)1 and 160.4(f) Insulation for Piping and Tanks The Energy Policy and Conservation Act (EPCA) amended Public Law 94-163 (42 U.S.C. 6291- 6317, as codified), among other things, which authorizes the Department of Energy (DOE) to regulate the energy efficiency of a number of consumer products, commercial, and industrial equipment. Federal energy efficiency requirements for covered products listed under EPCA are subject to the energy efficiency standards and test procedures established by EPCA.</p> <p>BWC alerts the CEC to the aforementioned energy efficiency requirements established under EPCA, as the Express Terms for 2022 Update to Energy Code references a regulation to impose an energy efficiency minimum for unfired hot water storage tanks (UFWHST) that exceeds the energy efficiency standards established by EPCA. UFWHST's federal energy conservation standard requires a thermal resistance of R-12.5; California states UFWHST shall be externally wrapped with insulation having an installed thermal resistance of R-4 or greater. To our knowledge, no other equipment with federal energy efficiency standards is handled in this manner in Title 24. CEC's mandatory requirement exceeds a federal requirement by a significant amount. In addition, it begs the following questions:</p> <ul style="list-style-type: none"> • What research and analysis did CEC complete to determine that wrapping a UFWHST with R-4 insulation is a mandatory requirement? • Has CEC evaluated the stored temperature of the service hot 	Staff appreciates the comment. This is existing language for over 20 years. Partially in response to this comment, the 2022 adopted changes updated the R-value to align with current DOE standard. Staff have thoroughly assessed the legality of the 2022 Energy Code, and have concluded our standards are not preempted.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238337&DocumentContentId=71641

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238337.002	Eric Truskoski, Bradford White Corporation	<p>Subchapter 11 Multifamily Buildings – Performance and Prescriptive Compliance Approaches Section 170.2(d) Water Heating Systems</p> <p>BWC appreciates California’s shift towards a HPWH baseline for Hotel/Motel Occupancies with the 2022 Energy Code and that Section 170.2(d) preserves options for mixed-fuel solutions.</p> <p>During the California Title 24 Building Energy Efficiency Standards hearings on 5/24, 5/27, and 5/28, the following questions were raised regarding HPWHs: Are multi-family requirements going to allow individual HPWH units with compressors within conditioned space (integrated compressor type HPWHs)? If so, have the CASE teams fully considered the impact of having a large air-conditioner in conditioned space in small apartments year-round and the impact this configuration has on both the HPWH system efficiency and ASHP [air source heat pump] efficiency?</p> <p>To summarize, CEC’s response was to not address installation requirements of an individual HPWH in multi-family and defer to the designer. We believe CEC’s approach should be similar regarding central HPWH systems serving multiple dwelling units; however, CEC has laid out installation requirements for 170.2(d)2, which are overly prescriptive. We believe CEC had good intentions with the requirements of 170.2(d)2 as HPWHs, especially central HPWHs, are a relatively new technology. It is critical that plumbers and installers receive the necessary</p>	Existing 2019 language in 150.1(c)8 already allows individual HPWH in multifamily units. The installation requirements in 170.2(d)2 for central HPWH are needed because these are built-up system and the performance of these systems are highly dependent on proper design. In contrast, individual HPWH are thoroughly tested and modeled as an unit.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=2383378&DocumentContentId=71641
238337.003	Eric Truskoski, Bradford White Corporation	<p>Appendix JA13 – Qualification Requirements for Heat Pump Water Heater Demand Management Systems</p> <p>Per Section 1.2.1 of ASSE 1084, “This water heater is intended to supply tempered water at point of use in order to reduce the risks of scalding.” These devices limit water temperature to a maximum of 120°F. A water heater listed to ASSE 1082, per Section 1.2 of the standard “is for water heaters that control the outlet temperature to specific limits and are installed within the hot water distribution system but not at point-of-use.” BWC points out the aforementioned, as JA13.3.1 Safety Requirements states, “A thermostatic mixing valve conforming to ASSE 1017 shall be installed on the hot water supply line following all manufacturer installation instructions or the water heater shall conform to UL 60730-1, ASSE 1082, or ASSE 1084.”</p> <ul style="list-style-type: none"> • Demand management functionality includes the advanced load up function. The system stores extra thermal energy, where some or all the tank may exceed the user’s setpoint temperature. • Has CEC considered how a water heater listed to ASSE 1084 will function when it receives a call for hot water and the stored tank temperature is greater than 120°F +3°/-5° F? A water heater listed to ASSE 1084 shall be set to deliver a maximum water temperature of 120°F or less. • California’s Self-Generation Incentive Program (SGIP) staff proposed basing the residential unitary HPWH on the energy storage capacity of a 50-gallon tank volume and a setpoint temperature of 135°F. A water heater listed to ASSE 1082 at >5 	JA13 is identical to the compliance option approved in 2020. The document was developed with industry consensus over a 18-month development period, during which Bradford White was a participant. Other water heater manufacturers have indicated there is no issue with the current language, and we expect OEMs to produce HPWHs that are safe for consumer use.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=2383378&DocumentContentId=71641

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238337.004	Eric Truskoski, Bradford White Corporation	<p>Appendix JA14 – Qualification Requirements for Central Heat Pump Water Heater Systems</p> <p>BWC thanks CEC for removing the requirement of defrost strategy algorithm from JA14.3.2. We alert CEC that manufacturers of federally regulated products, including HPWHs, are prohibited from providing or publishing testing results to other test points other than those established by DOE. Therefore, CEC’s requirements are imposing requirements on manufacturers such that they would be conflicting with federal requirements. CEC must defer to the federal metrics and test procedures, which necessitates the following edits to JA14:</p> <ul style="list-style-type: none"> • JA14.3.1(a) – Strike “for each of the test conditions described in JA14.3.3” • JA14.3.1(b) – Strike “to generate the performance data described in JA14.3.2” • JA14.3.2 – Strike “The performance data shall be provided at the following conditions: <p>d) Inlet ambient air temperature: Maximum, minimum, and two midpoint temperatures of the manufacturer specified operating range.</p> <p>e) Inlet water temperature: Maximum, minimum, and two midpoint temperatures of the manufacturer specified operating range.</p> <p>f) Outlet water temperature: Maximum, midpoint, and minimum of outlet water (setpoint) temperatures of the manufacturer specified operating range.”</p> <ul style="list-style-type: none"> • JA14.3.3 – Strike this entire section. The section is void, as the 	<p>JA14 is a voluntary reporting of performance data for compliance credit. It is not required to meet either the prescriptive or performance requirements for central HPWH and strictly optional for central HPWH products to obtain additional compliance credit. We have thoroughly assessed the legality of the 2022 Energy Code, and have concluded our standards are not preempted.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238337&DocumentContentId=71641
238337.005	Eric Truskoski, Bradford White Corporation	<p>Compliance to Energy Codes Using Federal Energy Efficiency Standards</p> <p>BWC supports AHRI Comments on CEC Draft Staff Report - California Building Decarbonization Assessment, especially the following.</p> <p>“Indeed, AHRI has expressed concern with CEC’s proposed approach to electrification of buildings through the removal of certain equipment types to meet Code through the prescriptive path. Indeed, there are federal preemption issues related to proposed changes to single family, multifamily, and non-residential sections regarding space heating, space cooling, and water-heating systems. These proposals have removed options for certain equipment with federal energy efficiency standards to comply with the energy code using the prescriptive pathway. With these proposals, CEC is considering the prescriptive and performance pathways to be separate; however, they are not severable. The prescriptive path sets forth specific requirements that HVAC systems and equipment must meet to comply with the Code if a building does not comply with the performance-based compliance paths. The concept of compliance to energy codes through multiple pathways using minimum efficiency equipment is a fundamental aspect of the Energy Policy and Conservation Act (EPCA). Equipment efficiency has increased dramatically under EPCA and has contributed significantly to the reduction of emissions.”¹</p> <p>Given these concerns, BWC recommends the CEC to revise any</p>	<p>Prescriptive requirements in the Energy Code do not exclude the installation of other equipment through the performance path. Additionally, some items are voluntary such as JA14 and are therefore only required if the project is claiming additional energy credit for the associated equipment.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238337&DocumentContentId=71641

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238338.001	Kyle C Jones, Thomas A Enslow, California Stae Pipe Traces Council	The California State Pipe Trades Council opposes these proposed amendments because they effectively impose all-electric construction requirements before a statewide plan for a fair, safe, and equitable transition to building decarbonization can be completed. While packaged as a limited, incremental step toward electrification, the requirements will effectively create an all-electric requirement for most new construction by making dual fuel construction significantly more expensive.	The proposed HP baselines are prescriptive requirements and not mandatory requirements. Builders can choose whether to comply via prescriptive or performance paths. The prescriptive path establishes TDV and source energy budgets for the performance path. The performance path can be used to meet these budgets for mixed fuel homes using other measures, such as dual-fuel heat pumps, additional energy efficiency measures such as better windows, slightly larger PV systems, or battery storage systems.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238338&DocumentContentId=71640
238338.002	Kyle C Jones, Thomas A Enslow, California Stae Pipe Traces Council	Decarbonization requires an integrated and coordinated statewide approach in order to avoid unintended impacts on safety, rates, infrastructure, grid reliability, equity, and workers. The recent Gridworks Report Phase I report provides a detailed analysis of the problem with an uncoordinated transition away from natural gas.1 While there is consensus that natural gas usage must be reduced to meet GHG goals, it is already being reduced in a manner that will impose great cost burdens on those who cannot afford it and on workers whose livelihoods will be impacted by this transition.	Strongly agree that decarbonization requires an integrated approach with attention to these factors. This is much bigger than the GHG reducing, energy efficiency and load shifting measures proposed for adoption in this code cycle. The adoption of highly efficient heat pump baselines in specific applications is a prudent step in that larger approach. The CEC supports a coordinated, multi-agency transition away from onsite combustion of natural gas.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238338&DocumentContentId=71640
238338.003	Kyle C Jones, Thomas A Enslow, California Stae Pipe Traces Council	The California State Pipe Trades Council understands that many members of the environmental community are impatient to adopt all-electric construction requirements as an immediate step toward decarbonization. But it cannot be ignored that such an action would create immediate significant job losses for plumbers and other blue-collar workers who currently make a living installing gas piping and appliances in buildings. An action with such significant job loss impacts should not be rushed through without ensuring that these job losses will be minimized or mitigated. Where entire job sectors are being eliminated or phased out, we need to ensure that there are no other alternative paths for reducing greenhouse gas emissions that could be taken to minimize those impacts. Where jobs are eliminated, concurrent actions need to be taken to provide a true, just transition to those whose livelihoods are directly impacted.	CEC strongly supports the need for an orderly transition for pipefitters to make a living as society makes the decarbonization changes necessary to avoid and mitigate the catastrophic impacts of climate change. One possibility might be to mitigate the impacts of extreme droughts through wide installation of grey water plumbing systems. The CEC would welcome multi-agency and industry coordinated efforts to accomplish this.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238338&DocumentContentId=71640
238338.004	Kyle C Jones, Thomas A Enslow, California Stae Pipe Traces Council	Currently, a statewide plan for decarbonization is being developed through a CPUC proceeding (rulemaking (R.20-01-007) to identify solutions to concerns regarding an uncoordinated approach to decarbonization. The solutions being discussed include a variety of paths including the use of renewable gas (biomethane, hydrogen). In addition, the California State Pipe Trades Council has engaged in discussions with NRDC, Sierra Club and others regarding how workforce impacts could be addressed. The California State Pipe Trades Council opposes the adoption of statewide electrification requirements prior to the completion of a coordinated and equitable statewide plan for building decarbonization that takes into account impacts on workers.	The current CEC building simulation tools are fully capable of considering the benefits of biomethane and hydrogen that are mixed with natural gas. Currently these alternatives make of less than 10% of the total volume of gas delivered to the end users. If and when these ratios improve, the source energy metric can be updated to reflect those benefits.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238338&DocumentContentId=71640

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238339.001	SMUD	<p>SMUD appreciates the CEC's leadership in prioritizing decarbonization in the 2022 Energy Code. There is a climate change crisis, and we encourage the swift implementation of known strategies that reduce greenhouse gas (GHG) emissions from fossil fuels and refrigerants. California cannot achieve its landmark 2030 and 2045 carbon reduction goals without electrification of most energy end uses. Moving to an all electric baseline will provide greater access for equity communities to clean energy and energy efficiency to reduce overall utility costs. Building electrification combined with clean electricity is a critical component to meeting the state's emissions and air pollution goals. Building electrification also has a lower first cost than gas construction and is cost-effective for consumers. SMUD strongly supports the CEC adopting an all-electric baseline for the 2022 Energy Code for residential and commercial buildings.</p> <p>Introduction The inclusion of heat pump baselines and the option of community solar to meet on-site PV requirements are important elements in achieving building electrification. SMUD has been generally supportive of staff proposals as noted in our comments throughout the pre-rulemaking. We offer the following suggestions regarding heat pump baselines and community solar to improve the 2022 Express Terms. We also support the dozens of other stakeholders who have advocated throughout this rulemaking for strong building decarbonization standards, including an all-electric baseline.</p>	Thank you for the comment of support	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=23833398.Document&ContentId=71639
238339.002	SMUD	With respect to Community Solar, SMUD offers three primary considerations for staff. First, while SMUD does not oppose an opt-out provision, SMUD is concerned that as written, the inclusion of an opt-out will discourage prospective program administrators from entering the market. Moreover, if an opt-out is conditioned on installation of a code-compliant onsite PV system, staff should clarify that administrators, as the providers of energy, are not and cannot be the entities responsible for code compliance.	Ensuring customer choice by allowing opt-out was one of the most strongly pursued improvements to SMUD's application based on public comment; enabling that to happen with strong communication about customer rights and responsibilities is a reasonable obligation for administrators to conduct and is an inherent part of good customer relations.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=23833398.Document&ContentId=71639
238339.003	SMUD	Second, with respect to choice at the point of purchase, SMUD notes that the inclusion of an opt-out provision obviates the need for such choice. If the customer is free to opt out upon installation of an onsite PV or battery storage system, there is no need to add additional logistical hurdles, costs, and delays to the construction process, particularly while California is in the midst of a housing crisis.	Staff agrees and the adopted language reflects this change. Staff deleted the Original Building Purchaser Choice provision.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=23833398.Document&ContentId=71639
238339.004	SMUD	Finally, with respect to provisions relating to Executive Director approval of revised applications, SMUD notes that future changes to the requirements of section 10-115 cannot be applied retroactively to require amendments to approved projects, programs, or customer agreements. Community solar administrators, customers, and other stakeholders that have taken action or entered into contracts based on applications that have been previously approved by the Commission should not be subjected to the uncertainty of future Code modifications.	Staff agrees. The adopted language does not retroactively apply to participating homes approved under prior Standards or to renewable resources already approved by the Commission.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=23833398.Document&ContentId=71639

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238339.005	SMUD	<p>SMUD supports the Express Terms' inclusion of electric appliances in the baseline for new residential construction. We appreciate the Commission's incorporation of prior comments which include:</p> <ul style="list-style-type: none"> • Updated space and water heating electric baselines that will require at least one electric appliance in each climate zone (and generally the bigger of the space and water heating appliances in most of the high-construction zones); • All-electric readiness measures for space heating, water heating, stoves, and dryers; • Differentiated range hood ventilation requirements for gas and electric stoves for both residential and multifamily construction; and • Electric heat pump space and water heating baselines in schools. 	Staff appreciates the comment supporting the proposed amendments in these areas.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238339&DocumentContentId=71639
238339.006	SMUD	<p>Section 10-115 - Community Solar a. 10-115 (a) (4) Building Owner Opt-Out i. SMUD does not oppose an opt-out provision but is concerned it will discourage new entrants.</p> <p>Community Solar provides developers, builders, and property owners an important, viable alternate compliance option, which is necessary to ensure California meets its clean energy goals. SMUD strongly supports staff's stated intent to "enhance the viability of community-scale projects as an alternative to on-site installation of renewable energy and energy storage systems." In furtherance of that goal, we join others in recommending that staff consider the potential implications of imposing an opt-out requirement on program administrators.</p> <p>Planning for and developing new community solar facilities and programs requires a significant investment of time, resources, and money. Contracts with program participants encourage and protect those investments. A large utility may have the ability to balance and repurpose utility scale resources without significant risk of stranding new community solar assets. However, allowing a customer to cancel a contract or to "opt out" at their convenience could discourage new solar developers and administrators—especially smaller, non-utility administrators—from entering the market.</p>	Ensuring customer choice by allowing opt-out was one of the most strongly pursued improvements to SMUD's application based on public comment; enabling that to happen with strong communication about customer rights and responsibilities is a reasonable obligation for administrators to conduct and is an inherent part of good customer relations	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238339&DocumentContentId=71639

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238339.007	SMUD	<p>Section 10-115 - Community Solar a. 10-115 (a) (4) Building Owner Opt-Out ii. Staff should clarify that community solar administrators are not the entities responsible for code compliance. The draft Express Terms allow a program participant to opt-out upon installation of a code-compliant onsite PV or battery storage system. However, Section 10-115, as drafted, does not specify who would be responsible for ensuring compliance prior to installation. To address this ambiguity, SMUD recommends that staff clarify that Local Enforcement Agencies (LEAs), and not administrators, are responsible for compliance and enforcement. LEAs, such as local building departments, have jurisdiction over code enforcement, along with expertise and well-established processes. Program administrators, which may include utilities or other public or private entities, are neither authorized nor equipped to manage compliance obligations and code enforcement.</p> <p>Finally, as discussed in greater detail below, SMUD requests that staff make clarifying revisions to section 10-115(a)(4) to ensure that interconnection of an onsite PV system does not automatically result in an opt-out, and that program administrators have flexibility in recovering costs incurred to effect the "opt out."</p>	<p>The obligation for Administrators to ensure that the right size PV system is installed to qualify for an opt-out is administration of a contractual requirement. Utilities involved in supporting CS programs are in excellent position to know what size PV system is inter-connected with their system and must verify that size meets NEM requirements. CEC approved SMUD's program with CC&R requirements to provide notice to subsequent building owners about obligations for the building to participate in CS program for 20 years, including ability for SMUD to enforce that participation. Regulations should be modified to call for such CC&Rs; this creates opportunity to record the PV size requirements from the compliance documents for the building at the time that the CC&Rs must be recorded. Regulations should also provide opportunity for CEC to approve alternative approach that enables Administrator to reliably ensure the opt-out PV requirement is met.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?to=238339&DocumentContentId=71693
238339.008	SMUD	<p>Section 10-115 - Community Solar a. 10-115 (a) (4) Building Owner Opt-Out ii. Staff should clarify that community solar administrators are not the entities responsible for code compliance. The draft Express Terms allow a program participant to opt-out upon installation of a code-compliant onsite PV or battery storage system. However, Section 10-115, as drafted, does not specify who would be responsible for ensuring compliance prior to installation. To address this ambiguity, SMUD recommends that staff clarify that Local Enforcement Agencies (LEAs), and not administrators, are responsible for compliance and enforcement. LEAs, such as local building departments, have jurisdiction over code enforcement, along with expertise and well-established processes. Program administrators, which may include utilities or other public or private entities, are neither authorized nor equipped to manage compliance obligations and code enforcement.</p> <p>Finally, as discussed in greater detail below, SMUD requests that staff make clarifying revisions to section 10-115(a)(4) to ensure that interconnection of an onsite PV system does not automatically result in an opt-out, and that program administrators have flexibility in recovering costs incurred to effect the "opt out."</p>	<p>The obligation to install a rooftop PV system that meets or exceeds the size required by the Standards in effect at the time that home was built, prior to discontinuing participation in a CS program, is implemented by contractual obligations that the Administrator must ensure. Revise regulations to obligate CC&Rs that provide notice to all building owners of the obligation for building to participate for 20 years or install the required PV system to opt-out- allow an alternative for CEC to consider approving another approach to ensure compliance with the durability/opt-out requirements.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?to=238339&DocumentContentId=71693

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238339.009	SMUD	<p>b. 10-115 (a) (8) Original Building Purchaser Choice: the inclusion of an opt out provision obviates the need for this option.</p> <p>The Community Solar option is intended to add choices for builders and customers, rather than restrictions, thereby reducing overall costs to purchasers. SMUD agrees that consumers should have a choice among all available Community Solar and on-site solar options to make fully informed decisions. However, mandating that a builder offer the option of installing an on-site solar generation system is problematic as it could in many cases result in unnecessary infrastructure, the need for duplicative compliance calculations and other efforts, higher costs for purchasers, and penalties to developers that cannot feasibly install on-site solar. Further, such mandate gives preference to on site solar irrespective of cost. Finally, SMUD believes the inclusion of an opt-out provision obviates the need for the Original Building Purchaser Choice provision. In other words, the original purchaser can choose to opt out of a community solar program after closing escrow and comply with Section 150.1(b)(1) by installing on-site solar at that time. A Community Solar program should not preclude the home purchaser from installing on-site solar or on-site storage in the future.</p>	Staff agrees and the proposed language reflect this change. We deleted the Original Building Purchaser Choice provision.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238339&DocumentContentId=71635
238339.01	SMUD	<p>c. 10-115 (c) Executive Director Approval of Revised Applications - Community Solar administrators should not be required to submit revised applications to existing approved programs to retroactively apply changes to Section 10-115 in future code cycles.</p> <p>SMUD seeks clarity on the proposed requirement for an administrator "of an approved community shared solar electric generation system" [emphasis added] to submit a revised application when the Commission modifies the requirements of the Community Solar regulation provisions. As stated, this broad mandate could effectively necessitate a retroactive application of new revisions to the Code to already implemented programs previously approved by the Commission. Community Solar administrators, property owners, and other stakeholders act in reliance on the Commission's approvals. For example, as part of SMUD's Neighborhood SolarShares program, the Declaration of Covenants, Conditions and Restrictions (CC&Rs) recorded for Community Solar developments necessarily contain provisions committing the properties to the 20-year Community Solar alternative to ensure compliance with the Code. Complicated and costly changes to the CC&Rs would be required to retroactively permit changes to the Community Solar terms which have already been agreed to via these contracts. Subsequent changes in the law should not invalidate projects and systems in which millions of dollars have been invested. While SMUD supports the application of new requirements to</p>	Staff agree and the adopted language do not retroactively apply to participating homes approved under prior Standards or to renewable resources already approved by the Commission.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238339&DocumentContentId=71635

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238339.011	SMUD	<p>d. 10-115 (a)(6) Location – Locational requirements are appropriately aligned with individual utility system design.</p> <p>SMUD is supportive of staff's interest in localizing the Community Solar systems to the communities such systems are intended to serve. Aligning locational requirements with the utility service area rather than city or county boundaries will achieve staff's objective while recognizing the real-world utility system operation. SMUD supports the proposed language requiring the Community Solar project to be located on a distribution system of the utility providing electric service. We suggest that the language be clarified to recognize that a "distribution system" is subject to the design of the specific utility system.</p>	<p>The suggested change would be inconsistent with Commissioner intent on SMUD application to allow flexibility related to size to meet growth in demand. This could be considered in future rulemakings with full vetting if there are reasons to do so that are compelling.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238339&DocumentContentId=71631</p>
238339.012	SMUD	<p>e. 10-115 (a) (7) Size</p> <p>SMUD also supports the proposed 20 MW or less size parameter for new Community Solar resources. The 20 MW threshold mirrors the maximum size limit for resources in the CPUC Green Tariff/Shared Renewables (GTSR) program and is consistent with the parameters in the Coalition for Community Solar Access March 2019 publication "Community Solar Policy Decision Matrix," which recommends resources be within a utility service area and no more than 20 MW in size.⁶ We caution, however, that Community Solar program standards should be sufficiently flexible to allow projects sized to enable utilities to meet growth in demand. For example, SMUD will only retire RECs on behalf of the Neighborhood SolarShares (NSS) program participants from new resources that are 20 MW or less, unless there is program demand that cannot be met from these resources at a particular point in time.</p>	<p>Thank you for the supportive comment</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238339&DocumentContentId=71632</p>

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238339.013	SMUD	<p>f. Proposed Revisions to Section 10-115</p> <p>In consideration of the comments above, SMUD offers the following proposed revisions to section 10-115(a)(4), which SMUD recommends dividing into three new subsections as follows. SMUD's proposed revisions are shown in red:</p> <p>Rationale for revisions to section 10-115(a)(4)(B). As set forth above, the 45-Day Language provides participants the ability to opt out of a community solar program upon installation of a compliant onsite PV or battery storage system. However, section 10-115(a)(4) does not identify the entity responsible for ensuring compliance of a compliant onsite PV or battery storage system. Community solar program administrators may have neither the local authority nor technical or administrative ability to enforce the Energy Code. Thus, we recommend clarifying that, consistent with other provisions of the Energy Code, local enforcement agencies are responsible for compliance.</p> <p>Rationale for revisions to section 10-115(a)(4)(C). Currently, section 10-115(a)(4) states that all costs associated with participation in a community solar program shall cease at the point of interconnection of an onsite PV or battery storage system. In some cases, however, customers may have the ability to install onsite PV or battery storage and simultaneously participate in a community solar program. In such cases, customers would continue to pay costs associated with</p>	Thank for for the suggested language. Please see response to item 1-12 above (TN238339)	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238339&DocumentContentId=71633
238339.014	SMUD	<p>2. Heat pump baselines</p> <p>We appreciate the CEC's continued efforts to establish heat pump baselines that promote zero-emission electric construction. These efforts are critical to accelerating building decarbonization in alignment with California's broader emissions reduction goals. Staff's proposal provides meaningful incentives for electrification which should result in most of the market transitioning to all-electric over the next code period, while giving builders flexibility to transition at their own pace.</p>	Thank you for the comment of support	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238339&DocumentContentId=71633
238340.001	Dawn Anaiscourt, SCE	<p>SCE Supports Transition to an All-Electric Energy Code for New Construction.</p> <p>SCE appreciates the CEC's efforts in taking these measured, incremental steps toward the future goal of an all-electric code. As the state moves toward the 2030 decarbonization target, building electrification adoption needs to rapidly scale to achieve these ambitious energy and environmental goals. SCE looks forward to a 2025 Energy Code that will fully electrify new construction in order to accelerate efforts needed to be on a path to achieve California's 2030 decarbonization target.</p> <p>SCE continues to support an all-electric code to align with the state's carbon neutrality goal that will avoid natural gas emissions and additional spending on natural gas infrastructure that may become stranded before 2045. It is important to have an all electric code to ensure that all communities benefit from clean energy and that low income and vulnerable communities are not disproportionately burdened by fossil-fuel emissions and stranded assets.</p>	Thank you for the support. It should be noted that the performance path does allow for the installation of natural gas equipment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238340&DocumentContentId=71633

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238340.002	Dawn Anaiscourt, SCE	<p>To align with the CEC's AB3232 Building Decarbonization Assessment, the 2025 Energy Code Should Expand Retrofit Requirements to Replace Gas Appliances with Electric Alternatives in Order to Meet the State's 2030 Targets.</p> <p>On May 7, 2021, the CEC released the draft AB3232 Assessment, which provided a set of scenarios to assess the feasibility and costs of various building decarbonization strategies to reduce greenhouse gas (GHG) emissions by at least 40 percent by 2030. 1 Figure ES-6 of the draft AB3232 Assessment shows that the "aggressive electrification" scenario is needed to get close to the 2045 carbon neutrality target.2 The "aggressive electrification" scenario assumes that by 2030, California will have 100% all-electric new construction, along with 90% replace-on-burnout and 70% early retirement on gas water and space heating. 3</p> <p>The state now has less than ten years to reach the 2030 decarbonization target. An all electric new construction 2025 Energy Code will get us closer to the goal, but at that late stage it will not sufficiently replace gas end uses in residential and commercial buildings with efficient heat pump technologies needed to meet the state's climate goals. In addition to all-electric new construction in the 2025 Energy Code, the expansion of retrofit requirements to install electric alternatives when replacing gas appliances in existing buildings will be necessary to meet the 40% direct emissions reduction target of 32.6 MMTCO₂e by 2030 as noted the draft AB3232 Assessment.</p>	<p>Thank you for your input. As mentioned the 2022 Energy Code does provide prescriptive requirements for electric readiness and heat pump technologies for specific scenarios. Natural gas options are still allowed through the compliance path to ensure that projects have this option. This was done to provide flexibility for customers. The Energy Commission will continue to evaluate electrification options in future code cycles.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238340&DocumentContentId=71633
238340.003	Dawn Anaiscourt, SCE	<p>The Energy Code Must Include Upstream Gas Leakage for a Consistent Evaluation.</p> <p>Including upstream methane leakage from source fossil gas is necessary to show a direct and fair comparison with electricity, which includes upstream GHG emissions from generation.</p> <p>It is unclear whether and how upstream gas leakage is accounted for in the 2022 Energy Code. SCE's understanding is that GHG emissions resulting from upstream gas leakage is, to some extent, taken into account based upon the CEC's May 20, 2020 "Time Dependent Valuation of Energy for Developing Building Efficiency Standards, 2022 Time Dependent Valuation (TDV) and Source Energy Metric Data Sources and Inputs May 2020" document, Section 3.3.4.1 Methane Leakage.5 However, the CEC's responses on the May 24, 2021 hearing stated that upstream gas leakage was not considered.6</p> <p>SCE urges the CEC to include the upstream gas leakage in the 2022 Energy Code because upstream methane leakage is substantial. Page 41 of the draft AB 3232 Assessment states that current reports indicate a methane leakage rate of 2.3%. Other reports have indicated higher leakage rates, especially for out-of-state gas deliveries, mostly from south-central US (Texas, Oklahoma, Kansas).7 One report has concluded that a methane leakage rate over 2% is not an effective long-term substitute for coal for reducing climate change. 8 In addition, the leakage</p>	<p>Upstream gas leakage was not included because it was not considered as part of the building being permitted. When determining cost effectiveness of a measure proposals, these are considered to be costs and savings realized at the building. Including upstream gas leakage would include affects outside of this boundary.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238340&DocumentContentId=71633

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238341.001	QC Manufacturing Inc., And	<p>Prior to 2019 code HERS verifications, the following airflow derating s are being applied to the WHF models prior to the cfm/watts being sent to the physics engine:</p> <ul style="list-style-type: none"> • Airflow Degraded by +60% based on the assumption that only 1/3 of homeowners will open windows for cooling purposes. <p>In addition to the above software degradations applied to WHF airflow, the addition of 2019 code HERS resulted in a 3rd degradation of airflow:</p> <ul style="list-style-type: none"> • Airflow degraded by 67% if no HERS verification is applied to the performance model. <p>Using the above computations, a model for a 2000 sq ft home, with a proposed WHF of 3000cfm, will be derated as follows:</p> <p>1 st derating: 3000 * .60 = 990 CFM</p> <p>2 nd Derating 990 * .33 = 327 CFM</p> <p>The resulting airflow CFM of 327 cfm is 5-ton sent to the physics engine for computations to evaluate the cooling AC offsets of the whole house fan. This mathematically implies to the physics engine that if no HERS test is performed, the home will be receiving only 1/10th of the airflow rate and cooling power of the whole house fan, and this is mathematically not correct,</p>	<p>This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking. Evaluation of supporting software will continue as ongoing effort.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238341&DocumentContentId=71634
238342.001	Roger Dickinson, Local Government Commission	<p>We support the following changes made to the code that are especially critical to accelerate building decarbonization:</p> <ol style="list-style-type: none"> 1. Compliance incentives that encourage efficient electric space and water heating: With heat pump baselines set to the largest energy user among space or water heating in each climate zone, the compliance incentive approach has the potential to result in rapid and large-scale adoption of clean electric technologies. 2. Strengthened and expanded electric-ready requirements: Making new buildings electric-ready costs very little at the time of construction and will ensure that new homes fueled by gas will be able to affordably upgrade to electric appliances in the future. 3. Kitchen range hood requirements: The proposed requirements will improve indoor air quality and recognize the need for more stringency for gas stove hoods than electric stoves due to the higher pollutant risks from gas stoves. 	<p>Staff appreciates the comment supporting the proposed amendments in the noted areas.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238342&DocumentContentId=71633
238342.002	Roger Dickinson, Local Government Commission	<p>As the Commission is proposing to take a phased transition approach toward an all-electric requirement, the following important improvements are needed to ensure the 2022 code removes unnecessary barriers to advancing clean and efficient all-electric construction:</p> <ol style="list-style-type: none"> 1. Make heat pump water heaters (HPWH) the baseline for single-family in climate zone 10. Because heating is a relatively small load in climate zone 10, we support adjusting to a HPWH baseline to send a strong incentive toward decarbonization in this region. 	<p>The revision to prescriptively include heat pump water heaters for space conditioning in climate zone 10 was made.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238342&DocumentContentId=71633

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238342.003	Roger Dickinson, Local Government Commission	2. Expand the compliance incentive to system types most commonly used in large buildings. Large non-residential buildings often use multi-zone, packaged, or central HVAC and HPWH systems, and there is currently no compliance incentive for the electric heat pump versions of these systems in the Express Terms. Expanding incentives to all system types is needed to shift all new construction to clean electricity, so there is no need to build new gas infrastructure that will become stranded before the end of its life. As a first step, we recommend that the Commission expand the electric baseline systems to all packaged units, such as rooftop units, including those that serve multi zone systems.	To revise prescriptive requirements which are used in developing the baseline building model in the performance path, a measure proposal needs to be submitted, including analysis of cost and savings for the proposal. Based on the proposal the revisions to prescriptive requirements can be reviewed for future code cycles.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238342&DocumentContentId=71633
238342.004	Roger Dickinson, Local Government Commission	3. The Commission should continue to enhance the compliance software to be able to model HVAC systems not currently supported, including systems commonly used in large buildings, and advanced heat pumps used in all types of buildings.	Evaluation of supporting software will continue as an ongoing effort.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238342&DocumentContentId=71633
238342.005	Roger Dickinson, Local Government Commission	3. The Commission should continue to enhance the compliance software to be able to model HVAC systems not currently supported, including systems commonly used in large buildings, and advanced heat pumps used in all types of buildings.	The Energy Commission will continue to evaluate compliance software.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238342&DocumentContentId=71633
238343.001	Schneider Electric	1) The rule should focus on outcomes and be technology agnostic as far as the techniques used to achieve outcomes desired by the State of California. a. Examples of this are in the calling out specifically of thermostat based active load management over circuit breaker enclosure based or smart meter-based systems of the same type. b. While formulas for technologies like battery storage are great guidelines for resiliency and creating flexibility, they should not be a presumptive prescriptive technology solution in rules but speak to outcomes that are desired. Active load management platforms or building energy management systems (BEMS) for buildings of all types use air, water, and other thermal loads to optimize behind internal meters to customer desired outcomes. A price signal that represents needs or outcomes on circuits below substations on distribution systems is lacking that assistance all ratepayers on that circuit from receiving value from a BEMS extending their optimization past the intercoupling with the utility. This latter point is being taken up in a different rulemaking however its value should not be lost in this rule making.	Note that proposed language can be read in comment file. The Energy Code strives to be technology agnostic and in many cases the performance path allows for technologies other than those specified in the prescriptive path to be used. There may be cases where technology available in the market are limited, and this may influence how requirements are written in code as writing code language for unknown technologies may result in unclear requirements. Additionally, the Energy Code is focused on requirements for specific buildings making it difficult to develop code language that limits how the benefits beyond the building can be used to justify code requirements.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238343&DocumentContentId=71632

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238343.002	Schneider Electric	2) Any presumption that customers will give up control of appliances or equipment in their home required by this rule is a mistake. There is little uptake past early adopters or enthusiasts that would allow a distribution utility that type of command and control past the electric meter. This also would be a vision that falls short of today's technology. Two way automated communication with BEMS or automated load management (ALM) that gives customers a pathway to set their values and distribution utilities to see uptake rates at price points represents a foundation for a functional transactive energy system that finds the best value from retail to wholesale markets.	Note that proposed language can be read in comment file. In general, for requirements that are dependent on customer participation on action, savings are typically adjusted by assuming a certain number of customers that do not follow through. In some instances there is still justification in providing requirements that allow capabilities that are dependent on customer action.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238343&DocumentContentId=71632
238343.003	Schneider Electric	3) Schneider Electric recommends a resilience requirement for buildings constructed in wildfire areas or areas that have experienced a Public Safety Power Shutoff (PSPS) in the previous 18 months should be created. Prescribe as an option to accommodate "resilience-ready" electrical infrastructure for buildings that do not meet the previous requirement. This could be by requiring: i) an electric panel that would accommodate future energy storage and isolation switch/relay to power critical loads or the entire facility or ii) new buildings to accept an external power source connection at the exterior of the building to support batteries or portable emergency backup generators.	Note that proposed language can be read in comment file. This proposal would need to be submitted with appropriate cost effectiveness justification. Based on the measure proposal this can be considered in future code cycles.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238343&DocumentContentId=71632
238343.004	Schneider Electric	4) The California Energy Commission should make a policy decision that is outcome based on energy storage sizing to address peak load management during the on-peak time periods (4 – 9 pm) affecting the Duck Curve. Also, serving critical loads to serve critical load circuits during a grid outage or rolling blackout as well.	Note that proposed language can be read in comment file. The sizing requirements for energy storage are based on the typical energy usage of that building type. The storage system proposal is based on costs and benefits realized at the building level and not a larger grid level cost effectiveness.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238343&DocumentContentId=71632

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238343.005	Schneider Electric	<p>5) For an all-electric building of all types, a BEMS or ALM should be required to offset the size increase of electrical distribution equipment to accommodate the many electrical loads; such as garages having more than one EV charger, induction electric ovens and stoves, HVAC systems, instant electric water heaters; will drive a considerable carbon footprint in the extra metal required to size the larger panels needed for 600 amp or larger electrical distribution equipment and wires into the home/building vs. using software and machine learning systems. Additionally, requiring separation in electrical distribution equipment of critical circuits such as heat, cooling, water, EV charging and renewable based generation on 240v and higher building circuits will give even more resiliency to the California building of the future.</p> <p>a. Specifically, in Section 110.10. There is an exemption for load management that should be a requirement for all building types not just residential to create consistency in policy outcomes.</p> <p>b. The requirement should be buildings with BEMS or ALM systems be able to deliver 48 hours isolated operation of critical circuits in the building. Critical circuits be they heat, cooling, hot water, minimal lights, transportation, each customer has values on what is critical and those should be considered as well as today's BEMS or ALMs can deliver that where hardware alone cannot. Size to the outcome rather than the technology.</p>	<p>Note that proposed language can be read in comment file.</p> <p>To increase measure requirements a proposal including analysis of costs and benefits for the proposed changes must be provided. Based on the proposal the revisions can be considered for future code cycles.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238343&DocumentContentId=71632
238344.001	Trane Technologies	<p>Mandatory Filter Gasketing Requirements – Sections 120.1(c)1D, 150.0(m)12Bv, and 160.2(b)1Bv While it is understandable that in utilizing MERV 13 filters the desire to have higher degree of filtration was desired. The terminology of requiring filter racks to be “gasketed or sealed” to eliminate any air from bypassing leaves no methodology to verify that it has been achieved. It is highly unlikely that 100% leakage or bypass can be achieved yet no leakage rate or standard is Trane Technologies 800-E Beaty Street, Davidson, NC 28036 offered to show that the filter rack is in compliance. This ambiguity will leave the code official in a hard position to in fact verify the code. Often in commercial HVAC systems side loading filters are utilized. Employing full gasketing around the filter will in fact mean through continually sliding in and out over time the gasket will crimp or degrade and not achieve the desired goal.</p>	<p>Staff appreciates the comment. The 15-day draft language revises the language for filter gasketing.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238344&DocumentContentId=71630
238344.002	Trane Technologies	<p>Fan Power Budget – Sections 140.4(c), 170.2 Trane technologies has some major concerns with the Fan Power Budget as proposed. We do however encourage the alignment with the entirety of the ASHRAE 90.1 code as it was a consensus process with building designers, engineers and expert industry personnel who have significant experience in the design of existing and new buildings. While it is clear the ASHRAE 90.1 code was utilized the Title 24 version goes “over and beyond” and leads to some products and system designs will be priced out of the market by having the building designer not able to reasonable methods to keep pressure drop low enough to make systems work.</p>	<p>Staff has not received any evidence of systems that will be priced out of the market for new construction. The requirements are intended for designers to implement better duct design. Staff understands issues with design when it comes to existing buildings and have reverted the allowance back to 2019 levels for VAV, where the CAV allowance has been built into the baseline. Staff understands this to be confusing and will work with the CASE team to clarify this in the compliance manuals.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238344&DocumentContentId=71630

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238344.003	Trane Technologies	Target was a 20% reduction in fan power budget. However, for some systems the budget is much lower. One test example for simple supply fan with energy recovery saw a 44% reduction in allowance. By doubling this reduction in energy, the proposal will significantly remove major system equipment types for the building designer.	Staff disagrees with comment and staff targets this reduction power from 9-20%. This issue has been resolved with Trane in a follow up meeting to review their calculations.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238344&DocumentContentId=71630
238344.004	Trane Technologies	For fan power the proposal uses mid-life for the filter pressure. This is not recommended because it can be manipulated. A supplier can use a low end of life number to manipulate the mid-life, while the building does not run this way. Recommend using clean filter to drive consistency across all suppliers.	Staff agrees with comment and have made changes to the standards by 2x clean filter drop.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238344&DocumentContentId=71630
238344.005	Trane Technologies	The allowance values in table 140.4-A are consistently lower than the allowance values in the similar proposal for ASHRAE 90.1. This will result in a total fan power budget reduction of about 30%. Some fan systems will be pushed out of the market. One of the three we tested would no longer be marketable.	Staff disagrees with comment and staff targets this reduction power from 9-20%. This issue has been resolved with Trane in a follow up meeting to review their calculations.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238344&DocumentContentId=71630
238344.006	Trane Technologies	Title for the 4th column is incorrect. It ought to be CV and Single Zone VAV Systems > 10,000 CFM.	Staff appreciates comment and have corrected the table errors.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238344&DocumentContentId=71630
238344.007	Trane Technologies	There is a fan power budget deduction for terminal units that recirculate air within a zone. However, there is not a similar deduction for ceiling fans.	Staff disagrees with this comment. Airflow for ceiling fans must not be included in the calculation of the fan system airflow and are able to move lots of air with little power. Staff has found that if these were included in the system airflow, the fan power allowance would be so large that the ducted portion of the system would get a free pass.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238344&DocumentContentId=71630
238344.008	Trane Technologies	Residential Heat Pump Baseline – Sections 150.1 – 150.2 Reducing our customers' carbon emissions is what drives our support for building decarbonization, and we are excited that CEC is proposing a holistic approach to decarbonizing buildings through the electrification of space heating technologies. We support the proposal to introduce a heat-pump baseline for space heating technologies in the specified climate zones via the prescriptive compliance pathway in single-family residential buildings while allowing dual-fuel heat pump systems via the performance pathway. This proposal, coupled with the electric-ready requirements, prepares California for a 2025 all electric code and allows time to reduce the state's grid reliance on fossil fuels, resulting in lower marginal CO2 emissions generated from the electric grid as electricity demand is increased in the near-term. We appreciate the work by CEC staff to develop a cost-effective, performance-based Energy Code that propels the transition to all-electric buildings while allowing time for the grid and heat pump market to adjust. As other states look to California for their climate leadership, we are excited to support this performance-based approach to drive strategic electrification and building energy efficiency improvements in the United States. This approach provides a strategic electrification model in colder climates or areas where the grid relies heavily on fossil fuels without compromising comfort, cost, performance.	Staff appreciates the comment of support.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238344&DocumentContentId=71630

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238344.009	Trane Technologies	<p>Definitions for several systems have issues:</p> <p>a. Fan system, Multizone requires 3 or more spaces none of which have more than 40% of the total air flow. The problem is that single zone has much lower fan power budget. Thus, old multi zone systems that do not meet these criteria will have a significantly lower fan power budget.</p> <p>b. Fan system, exhaust includes economizer in the definition. Economizers and exhaust systems have two completely different functions. This will confuse people.</p> <p>c. Fan system, relief only allows operation during economizing mode. However, relief fans can operate to remove excess air introduced to the building in order to meet ASHRAE 62 requirements, even when not in economizing mode.</p>	<p>A. The intent of this multizone definition is that the sum of the minimum airflows of the VAV boxes is 40% or less of the full system design airflow. Staff appreciates this comment and have revised the language based on this feedback.</p> <p>B. Staff appreciates this comment and have revised the language based on this feedback.</p> <p>C. Staff appreciates this comment and have revised the language based on this feedback.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238344&DocumentContentId=71630
238360.001	Home Ventilating Institute	ANSI/AHRI 1060: The definitions section introduces a new reference to ANSI/AHRI 1060, but this standard does not appear to be referenced anywhere. Please clarify where this standard will be referenced.	Staff have added a requirement to Section 140.4 that references AHRI 1060	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71669
238360.002	Home Ventilating Institute	Atmospherically vented: HVI requests that CEC provides a definition for this term, which was introduced within the DET. Please see comment 17 within the Mandatory Provisions section of this letter.	The term "atmospherically vented" is used but not defined in both ASHRAE Standard 62.2 and in Title 24, Part 4 (the California Mechanical Code). The 2008 Title 24 Part 6 update and all subsequent updates to Title 24 Part 6 have adopted by reference ASHRAE 62.2 section 6.4 requirements for combustion and solid fuel burning appliances that uses the term atmospherically vented, thus the term atmospherically vented is not a new term in the proposed 2022 Title 24, Part 6 express terms.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71669
238360.003	Home Ventilating Institute	<p>Fan efficacy: HVI requests that CEC modify its use of this term to align with the industry convention of reporting efficacy in terms of useful output divided by power input (i.e., cfm/W in the case of fan efficacy). This change would make CEC consistent with ENERGY STAR, HVI, IECC, and ASHRAE 90.1's use of this term. Further, using a cfm/W metric for fan efficacy would be internally consistent with the use of "efficacy" within Title 24 Part 6. For example, Section 100 of the DET defines the following efficacy terms using the convention of reporting useful output divided by power input:</p> <p>Luminous Efficacy is a measure of the luminous efficiency of a light source. It is the quotient of the total luminous flux emitted by the total light source power input, expressed in lm/W.</p> <p>Photosynthetic photon efficacy (PPE) is photosynthetic photon flux divided by input electric power in units of micromoles per second per watt, or micromoles per joule as defined by ANSI/ASABE S640.</p> <p>Finally, the convention of defining efficacy in terms of the useful output divided by power input is the most rational for communicating the term's intention. For example, improving the effectiveness of lamp is naturally understood to increase its efficacy metric, because an improved lamp is more efficacious. Likewise, improving the effectiveness of a fan should increase its efficacy metric. If CEC does not wish to align with ASHRAE 90.1,</p>	CA energy code has long used the Watt/cfm metric for air-handling units for space conditioning systems. Since use of Watt per cfm is a metric that is more reflective of the energy consumed by the air handling unit, CEC staff do not recommend changing the metric to cfm/Watt. If a change to the terminology for Watt/cfm is preferable in order to better align with other standards used by industry, CEC staff could consider adopting a different term for Watt/cfm during the next (2025) update to the energy code, which would allow the proposed change in terminology to be considered by stakeholders as part of the public proceedings.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71669

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238360.004	Home Ventilating Institute	Makeup air: HVI requests that CEC modifies the definition of this term. Please see comment 3 within the Mandatory Provisions section of this letter.	CEC has proposed kitchen range hoods be used that have greater airflow rates which may necessitate use of "makeup air" or "compensating outdoor air" as specified by ASHRAE 62.2 section 6.4. The inclusion of the term "makeup air" as a type of supply air that requires filtration clarifies that filtration is applicable to both makeup air and supply-only ventilation air, and that makeup air must also conform to the characteristics specified in the definition for makeup air in section 100.1 which does not apply to all supply ventilation system types. The Section 100.1 definition for makeup air provides specific direction for supply in the vicinity of an exhaust hood which minimizes the need to expend energy to condition the outdoor air introduced by the makeup air fan. ASHRAE 62.2 requires the compensating outdoor air to be interlocked with the exhaust hood. HVI has proposed a substantive change to the definition of makeup air that would abandon these and other constraints on makeup air systems that would result in higher energy impacts and possibly negative IAQ impacts for the dwelling unit. The HVI proposed change of the makeup air definition should be proposed as a change at the beginning of the next update to the Standards in order for the energy and IAQ impacts of the proposal to be vetted by stakeholders.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2383608.DocumentContentId=71669
238360.005	Home Ventilating Institute	HVI requests that CEC retain the prior definition of CFI, which is aligned with the industry use of this term. The proposed definition is too broad, in that it includes both traditional central fan integrated systems as well as discrete ventilation systems with dedicated fans that are integrated with the central duct work but whose operation need not be interlocked with the central air handling unit to provide filtered and distributed outdoor air. Please see the additional comments for Section 150.0(o)1B (comments 5 and 6 in the Mandatory Provisions section of this letter).	The proposed 2022 language change to the definition of CFI ventilation system clarifies the intent of the existing definition and does not change the effect of the existing (2019) definition. A CFI (central fan integrated) ventilation system is a ventilation system configuration in which the ventilation ductwork is connected to (has been integrated with) the duct system of a dwelling unit space conditioning system to enable distribution of ventilation air to the dwelling unit while the space conditioning system air handling unit (central fan) is operating. CEC staff do not agree with the commenter claim that the term CFI ventilation system does not apply to all system configurations that integrate ventilation ductwork with a central space conditioning system's ductwork. The commenter does not provide evidence or explanation of what is meant by the assertion: "the previous definition is aligned with industry use of this term".	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2383608.DocumentContentId=71669

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238360.006	Home Ventilating Institute	Whole-Dwelling Unit Mechanical Ventilation: ASHRAE 62.2 and Title 24-2019 use the term "dwelling unit mechanical ventilation" to describe the primary ventilation system used to provide outdoor air to a dwelling unit. If CEC is looking for a more user-friendly term, HVI recommends "fresh air system", which is supported by HVI's manufacturer members through a labeling program that is designed to comply with code and standard requirements for labeling of primary ventilation systems. See the following link for more information: https://www.hvi.org/resources/publications/fresh-air-system/ .	The term "dwelling unit ventilation system" is ambiguous since the standards must specify requirements for ventilation systems that provide for ventilation airflow for both the "whole dwelling unit" or for ventilation exhaust for only a single room or appliance in a dwelling unit. Previous versions of ASHRAE 62.2 used the terminology "whole-house" or "whole-Building" ventilation which was confused with whole house fans that provide ventilation cooling but are not used to provide the IAQ ventilation airflow for the entire dwelling specified by ASHRAE 62.2 section 4. CEC staff experience with enforcement has led to the conclusion that the very general term "dwelling unit ventilation" does not illicit the understanding that ASHRAE 62.2 intends. CEC staff contend that use of the term "whole-dwelling unit ventilation" will not be easily confused with local ventilation exhaust or with whole-house fans that provide cooling when the dwelling unit windows are opened. It is difficult to understand how an exhaust fan could be understood to be a "fresh air system" as suggested by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71665
238360.007	Home Ventilating Institute	Indoor lighting: Table 100.0-A (pdf pages 54-56 of the DET) shows that compliance with Section 130 is required for indoor lighting for low-rise residential as well as for non-residential and hotels/motels. The DET notes that this table will be updated for the 15-day language, so perhaps it is outdated. Beyond this table, it is not clear that there is a Section 130 requirement for low rise residential or multifamily dwelling units. Please clarify: a. Within the DET, are Sections 130.0(c), 130.0(d), and 130.0(e) applicable to low-rise residential, multifamily dwelling units, or the functional areas that are listed in Section 130.0(b)? b. Within the DET, are Sections 130.0(c), 130.0(d), and 130.0(e) relevant to lighting that is integrated with exhaust fans when located in areas of commercial buildings that are not within a multifamily dwelling unit and that are not within the functional areas listed in 130.0(b)?	Lighting requirements of Section 130 are applicable to areas, other than dwelling units, in nonresidential buildings and hotels/motels. a. Table 100.0-A refers to the applicable code sections. All functional areas of the applicable buildings, except fire station dwelling accommodations and hotel and motel guest rooms, should comply with applicable nonresidential lighting and controlled requirements. b. Section 130.0(c), (d) and (e) do not apply to lighting integral to appliances.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238360
238360.008	Home Ventilating Institute	150.0(k)2F and 160.5(a)2F Lighting Dimming Controls. The revisions to these sections would introduce requirements for dimming controls for all kitchen lighting. No exceptions are provided for kitchen range hood lighting or appliance lighting. Typically, kitchen range hood lighting is used for task lighting during cooking, when brightness is generally desired. Additionally, controls for range hood lighting are typically located on the device, limiting the ability to use after market dimming controls. Kitchen range hood lighting should therefore be exempted from the requirement for dimming control.	Staff found that the language in question did not impose the requirement that was of concern to the commenter. Sections 150.0(k)2F and 160.5(a)2F do not apply to appliance lighting. These were expressly luminaire requirements and did not apply to incidental task lighting provided by non-lighting appliances - the lighting in refrigerators and in ranges is similarly not required by this language to have wall-mounted controls or dimming controls.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238360

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238360.009	Home Ventilating Institute	<p>150.0(m)1E and 160.3(b)5v These sections prohibit compression of ventilation ducts within cavities. Generally, this is good practice. However, some ventilation fans are designed for compressed ducts in wall cavities. For example, some wall-mount exhaust fans accommodate 4" ducting that is slightly compressed to form an oval; such ducting has a greater hydraulic diameter than 3" ducting which would otherwise need to be used in a wall cavity to avoid compression (see image below). In this case, use of 4" round duct that is slightly compressed to form an oval can reduce static pressure, fan energy consumption, and coincident noise during fan operation. For these reasons, please consider modifying these sections as follows:</p> <p>Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts, except where approved by manufacturer installation instructions.</p>	The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71669
238360.01	Home Ventilating Institute	150.0(m)12Aii and 160.2(b)1Aii Filter Makeup Air (MUA) with MERV 13. These sections establish a new requirement to filter MUA with a MERV 13 filter. Please clarify:	The change to include the term makeup air is needed in order to explicitly clarify that a make-up air system is also a supply ventilation system, therefore subject to the requirements of sections 150.0(m)12Aii and 160.2(b)1Aii. The 2019 Energy Code update has required MERV 13 filtration of ventilation air that is brought into the dwelling unit by supply ventilation fans, and makeup air systems are a supply ventilation system type, thus MERV 13 is already required for makeup air systems in the 2019 Energy Code and is not a new requirement for the 2022 update to the Energy Code. Makeup air systems are a special case supply ventilation system that is required to be located in the vicinity of the kitchen range hood and is expected to be interlocked with the kitchen exhaust system. Refer also to ASHRAE 62.2 section 6.4 and definition for net exhaust flow: exhaust flow, net: flow through an exhaust system minus the compensating outdoor airflow through any supply system that is interlocked to the exhaust system.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71669
238360.011	Home Ventilating Institute	<p>150.0(m)12Aii and 160.2(b)1Aii Filter Makeup Air (MUA) with MERV 13. These sections establish a new requirement to filter MUA with a MERV 13 filter. Please clarify:</p> <p>a. Whether this provision applies to MUA that is needed for the operation of whole-house fans, which can provide over 10 times the annual air changes of a kitchen range hood MUA system in a typical single-family dwelling unit,¹</p>	response to a: Whole-house fans are not IAQ ventilation fans that could be used to comply with ASHRAE 62.2 or CA Energy Code ventilation requirements, and their operation is not mandatory (as IAQ ventilation fans are). Whole-house fans are ventilation cooling devices that are operated only when the dwelling unit occupant has determined to open the windows to bring in cool outdoor air. The Energy Code does not prohibit opening windows and doors, and does not specify MERV 13 filtration of air that passes through openings such as windows and doors. ASHRAE 62.2 section 6.4 exempts whole-house fans from the makeup air (compensating outdoor air) requirements.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71669

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238360.012	Home Ventilating Institute	<p>150.0(m)12Aii and 160.2(b)1Aii Filter Makeup Air (MUA) with MERV 13. These sections establish a new requirement to filter MUA with a MERV 13 filter. Please clarify:</p> <p>b. Whether this provision applies to passive inlets designed to provide MUA for the operation of a dwelling unit exhaust ventilation system, which can provide over 10 times the annual air changes of a kitchen range hood MUA system in a typical single-family dwelling unit,²</p>	<p>Response to b: The CA Energy Code definition for makeup air in section 100.1 states that makeup air is generally filtered and fan-forced. ASHRAE 62.2-2019 section 6.4.2 states: If the designed total net exhaust flow exceeds 15 cfm per 100 ft² of occupiable space when in operation at full capacity, the net exhaust flow must be reduced by reducing the exhaust flow or providing compensating outdoor air. Gravity or barometric dampers in nonpowered exhaust makeup air systems shall not be used to provide compensating outdoor air. ASHRAE 62.2-2019 defines net exhaust flow as: flow through an exhaust system minus the compensating outdoor airflow through any supply system that is interlocked to the exhaust system. CA Energy Code and ASHRAE 62.2 do not provide direction for use of passive inlets/vents.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238360&DocumentContentId=71665
238360.013	Home Ventilating Institute	<p>150.0(m)12Aii and 160.2(b)1Aii Filter Makeup Air (MUA) with MERV 13. These sections establish a new requirement to filter MUA with a MERV 13 filter. Please clarify:</p> <p>c. Whether an additional MERV 13 filter must be provided to pre-filter MUA within the MUA duct provided by the following system: a MUA duct that is integrated with the return trunk of a central air handler and whose operation is interlocked with the operation of the central air handler such that the makeup air passes through the central air handler's MERV 13 filter prior to crossing a mechanical cooling or mechanical heating heat exchanger, and</p>	<p>Response to c: As specified in Sections 150.0(m)12A and 160.2(b)1A: MERV 13 filtration is required for supply ventilation systems including makeup supply systems and for the supply side in a balanced HRV/ERV ventilation system. Sections 150.0(m)12Bi and 160.2(b)1Bi state that the system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through any system's thermal conditioning components. There are no requirements for pre-filtering ventilation air prior to MERV 13 filtration. Makeup air systems are a special case supply ventilation system type that are required to be located in the vicinity of an exhaust hood and expected to be interlocked with the exhaust system.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238360&DocumentContentId=71665
238360.014	Home Ventilating Institute	<p>150.0(m)12Aii and 160.2(b)1Aii Filter Makeup Air (MUA) with MERV 13. These sections establish a new requirement to filter MUA with a MERV 13 filter. Please clarify:</p> <p>d. Whether an additional MERV 13 filter must be provided to pre-filter outdoor air within the outdoor air duct provided by the following system: a supply or balanced dwelling unit ventilation system with an outdoor air duct integrated with the return trunk of a central air handler and whose operation is interlocked with the operation of the central air handler such that the outdoor air passes through the central air handler's MERV 13 filter prior to crossing a mechanical cooling or mechanical heating heat exchanger.</p>	<p>Response to d: As specified in Sections 150.0(m)12A and 160.2(b)1A: MERV 13 filtration is required for supply ventilation systems including makeup supply systems and for the supply side in a balanced HRV/ERV ventilation system. Sections 150.0(m)12Bi and 160.2(b)1Bi state that the system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through any system's thermal conditioning components. There are no requirements for pre-filtering ventilation air prior to MERV 13 filtration. Makeup air systems are a special case supply ventilation system type that are required to be located in the vicinity of an exhaust hood and expected to be interlocked with the exhaust system.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238360&DocumentContentId=71665

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238360.015	Home Ventilating Institute	<p>HVI Recommendations:</p> <p>i. Revise the definition of MUA. HVI supports requirements for filtration of outdoor air, and for that reason, proposes the following revision to the definition of makeup air to ensure that all outdoor air that is "intentionally conveyed by openings or ducts into the building from the outside" is filtered prior to delivery to the occupiable space:</p>	<p>The Section 100.1 definition for makeup air provides specific direction for supply in the vicinity of an exhaust hood which minimizes the need to expend energy to condition the outdoor air introduced by the makeup air fan. ASHRAE 62.2 requires the compensating outdoor air to be interlocked with the exhaust hood. HVI has proposed a substantive change to the definition of makeup air that would abandon these and other constraints on makeup air systems that would result in higher energy impacts and possibly negative IAQ impacts for the dwelling unit. The HVI proposed change of the makeup air definition should be proposed as a change at the beginning of the next update to the Standards in order for the energy and IAQ impacts of the proposal to be vetted by stakeholders.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?m=238360&DocumentContentId=71668
238360.016	Home Ventilating Institute	<p>HVI Recommendations:</p> <p>ii. Do not require double-filtration of outdoor air or double-filtration of MUA prior to introduction. Dwelling unit ventilation systems or makeup air systems that are integrated with the central duct system and whose operation is interlocked with the central fan such that the outdoor air or makeup air passes through the central air handler's MERV 13 filter prior to introduction to the occupiable space should not be required to have a separate MERV 13 filter or be required to provide gaskets/sealing for their filters.</p>	<p>As specified in Sections 150.0(m)12A and 160.2(b)1A: MERV 13 filtration is required for supply ventilation systems including makeup supply systems and for the supply side in a balanced HRV/ERV ventilation system. Sections 150.0(m)12Bi and 160.2(b)1Bi state that the system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through any system's thermal conditioning components. There are no requirements for pre-filtering ventilation air prior to MERV 13 filtration, or double-filtration of ventilation air. Makeup air systems are a special case supply ventilation system type that are required to be located in the vicinity of an exhaust hood and expected to be interlocked with the exhaust system.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?m=238360&DocumentContentId=71668
238360.017	Home Ventilating Institute	<p>HVI Recommendations:</p> <p>iii. Provide alternative paths for compliance. HVI requests that CEC provide a compliance path for specification of ventilation systems that may not readily accommodate MERV 13 filtration, such as passive inlets and whole-house fans. Ventilation systems that introduce unfiltered or sub-filtered outdoor air could be paired with systems that filter the outdoor air after it is introduced into the indoor environment. For example, CEC could require that when a whole-house fan or passive inlets are provided that the central air handler with a MERV 13 filter be provided with controls that establish fan-only filtration cycles. The appropriate run time would likely need to be determined through models or simulations. This and potentially other strategies could result in achieving comparable average annual exposure for occupants across various ventilation system types.</p>	<p>The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?m=238360&DocumentContentId=71668

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238360.018	Home Ventilating Institute	<p>150.0(m)12Bv and 160.2(b)1Bv Air Filtration System Design and Installation. This section introduces requirements for gasketing or sealing to reduce filter bypass. Presumably, the objective of this requirement is to ensure that the MERV 13 filter functions as designed to protect occupants from exposure to small airborne particles. Ancillary filters that are intended to protect equipment from coarse particulate matter and debris should not be subjected to the same sealing and gasketing requirements as the MERV 13 filter that is provided for occupant IAQ; further, manufacturers bear the responsibility for specifying the filtration level and any sealing necessary to protect the equipment that they provide. HVI requests the following exception be provided for such ancillary filters:</p> <p>Exception to Section 150.0(m)12Bv [160.2(b)1Bv]: Ancillary filtration provided to protect system components and not intended to comply with Section 150.0(m)12C [160.2(b)1C] requirements is exempt from requirements for gasketing or sealing.</p>	CEC staff did not provide an exception as suggested by this commenter, however staff made a change to the 15-day language in sections 150.0(m)12Bv and 160.2(b)1Bv that the commenter stated has addressed their concern. This was then adopted by the Commission.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238360&DocumentContentId=71665
238360.019	Home Ventilating Institute	<p>Additionally, where MERV 13 filters are integral to mechanical ventilation systems, are provided to comply with the requirements of Section 150.0(m)12C [160.2(b)1C], and the filter installation location is labeled as requiring an OEM filter, manufacturers can ensure that there is a tight fit between the filter's frame and the filter rack/slot to limit bypass. This fit can be much tighter than would otherwise result from that achieved in separate, custom made metallic filter boxes / racks used in combination with "of-the-shelf", generic filters from local suppliers which could vary in dimension and create large gaps depending on the combination selected. To encourage integrated filter solutions with known dimensions and a tight fit, HVI requests that CEC provide the following exception:</p> <p>Exception to Section 150.0(m)12Bv [160.2(b)1Bv]: Filters that are integral to a mechanical ventilation system, provided to comply with the requirements of Section 150.0(m)12C [160.2(b)1C], labeled accordingly, and specified to be replaced with OEM filters are exempt from the requirements of Section 150.0(m)12C [160.2(b)1C].</p>	CEC staff did not provide an exception as suggested by this commenter, however staff made a change to the 15-day language in sections 150.0(m)12Bv and 160.2(b)1Bv that the commenter stated has addressed their concern. This was then adopted by the Commission.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238360&DocumentContentId=71666
238360.02	Home Ventilating Institute	<p>Finally, please clarify whether the following scenarios would comply with the gasketing and sealing requirements of these sections:</p> <p>a. Scenario A: A filter with a flat surface is held against another flat surface with pressure applied by a gasket or seal from the opposite surface. For example, a square cardboard filter squeezed against the bottom of an EPS insulated housing filter slot of a supply only ventilation device by a compressible sealing material on the opposite surface (e.g., within the access door).</p> <p>b. Scenario B: A filter with a tight fit on at least 4 edges of the perimeter is installed against a hard, flat surface.</p>	Staff worked with the commenter to address this issue. The 15-day revised language in sections 150.0(m)12Bv and 160.2(b)1Bv specifies: Filter racks or grilles shall use gaskets, sealing or other means to close gaps around inserted filters and prevent air from bypassing the filter. The commenter stated this revised language addresses their concerns.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238360&DocumentContentId=71665

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238360.021	Home Ventilating Institute	150.0(o)1B and 160.2(b)2Aii Central Fan Integrated (CFI) Ventilation Systems, continuous operation. Please explain why CEC introduced an exception to operate CFI systems continuously within multifamily dwelling units when this option has been prohibited in low-rise dwelling units in the past and continues to be prohibited for single-family dwelling units.	According to the EXCEPTION to Section 160.2(b)2Aii: The Energy Commission may approve continuous operation of central fan integrated ventilation systems pursuant to Section 10-109(h). The exception was introduced for the 2019 Title 24 Part 6 update which brought ASHRAE 62.2 requirements into section 120.1 (high-rise residential dwelling units) due to the change in scope for ASHRAE 62.2 to include high-rise residential dwelling units previously covered by ASHRAE 62.1. Thus the prohibition on continuous operation of a CFI system that has long been applicable to residential dwelling unit CFI ventilation systems was made applicable to high-rise residential dwelling units. To address stakeholders concerns, the exception which allows the opportunity to deviate from a mandatory requirement, was made explicit for high-rise residential CFI continuous operation proponents to enable them to engage the CEC in a compliance option proceeding according to section 10-109(h) in order for proponents to be able to demonstrate that continuous operation of the central fan does not consume excessive fan power. Stakeholders did not request a similar accommodation for residential standards in 150.0(o). The prohibition on continuous operation for residential standards has been in place for residential dwelling units since the 2013 update to the CA Energy Code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=238360&DocumentContentId=71665
238360.022	Home Ventilating Institute	150.0(o)1B Central Fan Integrated (CFI) Ventilation Systems, motorized dampers, and central air handler interlock. When integrated with the central duct system, discrete ventilation systems can be designed to supply outdoor air to, and/or exhaust indoor air from multiple rooms in the home by using existing duct work. This configuration can improve the distribution of ventilation air while reducing installation costs and fan energy use. However, this modified definition coupled with the change proposed to Section 150.0(o)1B of the DET would increase both first costs (by requiring that controls be provided to interlock the operation of the central air handler and the ventilation system and that motorized dampers be provided for any ventilation ducts connected to the central duct system) and increase annual energy costs (by requiring that these systems operate the central fan in addition to the discrete fan during each ventilation cycle) of these systems.	Motorized dampers reduce or eliminate unintended leakage through integrated ventilation ducts during calls for heating and cooling that do not coincide with calls for ventilation. This saves energy by preventing leakage of conditioned air from the dwelling unit, and by preventing introduction of unwanted outdoor air into the dwelling unit that must subsequently be conditioned when ventilation air is not otherwise required. Current Title 24 Part 6 regulation prohibits continuous operation of CFI ventilation systems and does not specify an allowance for CFI configurations that introduce continuously operating mechanical ventilation systems into a central space conditioning system that operates intermittently. Also, the compliance manual and compliance docs have long directed that a motorized damper be used when ventilation air is ducted into a space conditioning system duct system. When fan-forced ventilation air is supplied to a central space conditioning system that is not operating, air can backflow through the central air handler's return grille MERV 13 air filter and re-entrain particulates into the dwelling unit's indoor air which defeats the intended IAQ improvement purpose of requiring MERV 13 filtration. Staff requires the commenter to provide research evidence that backflow of air across a MERV 13 air filter is an advisable standard design practice, and there would be no adverse dwelling unit IAQ effects from CFI system configurations that cause ventilation air to backflow through a space conditioning system's MERV 13 filter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=238360&DocumentContentId=71665
238360.023	Home Ventilating Institute	Motorized Dampers – Clarifications Please clarify that a motorized damper that is integral to a ventilation system can meet the requirement for a motorized damper in Sections 150.0(o)1Biii. For such systems, there is no need to have an additional damper “installed on the connected ventilation duct(s).”	The proposed clarifications in 2022 Title 24 Part 6 sections 150.0(o)1B, and 160.2(b)2Aii specify that the damper shall be installed on the ventilation ducts. Specification for use of dampers integral to a ventilation system air handling unit are not given explicitly.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=238360&DocumentContentId=71665

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238360.024	Home Ventilating Institute	<p>Motorized Dampers - Recommended Exceptions Motorized dampers can effectively reduce leakage through outdoor air versus gravity dampers in certain situations, such as when the ventilation system is off and when the central air handler's induced pressure would cause the gravity damper to open during operation. However, there are cases when there is no added value associated with specifying a motorized damper, such as:</p> <p>a. Where the ventilation system's discrete fan is designed to operate continuously,</p> <p>b. Where a gravity damper is provided on an outdoor air duct connected to the central air handler's supply duct, or</p> <p>c. Where a gravity damper is provided on an exhaust duct connected to the central air handler's return duct.</p> <p>d. Where a gravity damper is provided on an outdoor air duct connected to the central air handler's return duct and such gravity damper is provided with a mechanism that prevents its opening under the design negative static pressure of the central air handler's return duct. For example, some ventilation fan manufacturers provide integral gravity dampers with magnets that can be used for this purpose. Dampers held closed by such magnets open at static pressures that are expected to be beyond that which would be experienced during the run time of</p>	<p>Response to a: The Standards do not allow CFI ventilation systems to operate continuously.</p> <p>Since CFI systems are not allowed to operate continuously, this system configuration would need a controlled motorized damper to prevent introduction of outdoor air into the space conditioning system ducts when the space conditioning system is not operating.</p> <p>Response to c: This damper arrangement would fail a duct leakage test. Taping off ventilation openings is not allowed for space conditioning system duct leakage testing.</p> <p>response to d: The CA Energy Code residential compliance manual and compliance documents have long directed that a controlled motorized damper be used when ventilation air is ducted into a space conditioning system duct system. A controlled motorized damper is necessary in order to only allow ventilation airflow to enter the space conditioning system when ventilation airflow is required for compliance with the standards. When the central fan operates for extended periods to handle heavier conditioning loads the ventilation air required may be satisfied prior to the point that space conditioning system meets the thermostat setpoint.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238360&DocumentContentId=71665
238360.025	Home Ventilating Institute	<p>Damper Control – Recommended Exception Generally speaking, the requirements in Section 150.0(o)1B.iii to close dampers when the ventilation system is not operating and open dampers when the ventilation system is operating are good practice. However, this section (perhaps inadvertently) prohibits H/ERVs from using recirculation defrost when connected to a duct system serving a space conditioning system. Such a condition is not expected to occur frequently, especially for systems specified in California, and when there is a need to defrost an H/ERV, recirculation defrost will result in lower contributions to peak power than electric resistance defrost. To ensure that such recirculation defrost H/ERVs, which represent the vast majority of H/ERVs available in North America, can continue to be used and integrated with central air handler ducts in California, HVI offers the following options for CEC's consideration:</p> <p>a. Retain the previous definition of the VENTILATION SYSTEM, CENTRAL FAN INTEGRATED, or CFI within Section 100.0 to exclude discrete ventilation systems with dedicated fans from the definition,</p> <p>b. Provide an interpretation to confirm that an "outdoor air fan" is not considered an "outdoor air fan" for an H/ERV during recirculation defrost, or</p> <p>c. Change 150.0(o)1B.iii as follows: "...If the outdoor airflow supplied to the CFI system is powered by a discrete ventilation</p>	<p>Staff understands the current (2019) version of the section 100.1 definition for CFI is applicable to any CFI configuration regardless of whether or not the ventilation air ducted to the space conditioning system is fan powered, thus the 2022 update clarifies but does not change the effect of the CFI definition. Staff understands there are alternative ventilation duct configurations that induce ventilation air into the airflow of a central space conditioning system but do not directly connect to the space conditioning system ducts and instead provide ventilation supply through a dedicated ventilation-only supply register placed adjacent to the space conditioning system's return grille that will provide the same performance as CFI and avoid use of dampers and damper controls, thus there are alternatives available that address the commenter's concern for recirculation defrost.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238360&DocumentContentId=71665

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238360.026	Home Ventilating Institute	<p>Central Air Handler Interlock – Recommended Exceptions Central air handler interlock with a ventilation system that uses a discrete fan to supply outdoor air to a central air handler's duct system can provide an effective means for controlling the direction and distribution of outdoor airflow. However, interlocking the operation of the central air handler is not required to accomplish these ends in all cases. For example, the following configurations can provide effective means of accomplishing these ends while saving hundreds to thousands of kilowatt-hours of central fan energy consumption per dwelling unit:</p> <p>a. Where an outdoor air supply duct is routed to the central air handler return duct, upstream of the central air handler filter; the instantaneous or design condition ventilation supply air temperature is no less than the minimum return temperature permitted by the manufacturer of any furnace connected to the central air handler return; and the H/ERV exhaust is not ducted to the central air handler return.</p> <p>b. Where an outdoor air supply duct with an integral MERV 13 filter is routed to the central air handler return duct, downstream of the central air handler filter; the instantaneous or design condition ventilation supply air temperature is no less than the minimum return temperature permitted by the manufacturer of any furnace connected to the central air handler return; and the H/ERV exhaust is not ducted to the central air handler return.</p>	Staff understands that space conditioning system manufacturers specify minimum return air temperatures that are higher than the colder outdoor air temperatures in some climates, and there are no provisions in Energy Code to ensure there would be no violation of the manufacturer's specified minimum temperature other than to ensure the ventilation air is mixed with space-conditioned airflow while the space conditioning system is operating. If outdoor ventilation air is supplied to a duct or plenum of a space conditioning system that is not operating, it will not be mixed or distributed throughout the dwelling unit, and it will flow directly through the nearest supply or return register/grille, which may involve flow through the conditioning coil for the space conditioning system. Staff understands there are alternative ventilation duct configurations that induce ventilation air into the airflow of a central space conditioning system but do not directly connect to the space conditioning system ducts; and instead provide ventilation supply through a dedicated ventilation-only supply register placed adjacent to the space conditioning system's return grille which will better facilitate verification of airflows, and provide the same performance as CFI while avoiding the need for dampers, damper controls, or interlocking the ventilation system operation with the space conditioning system operation. Verification of ventilation airflow can be difficult or impossible when ventilation ducts are connected to a space conditioning system duct or plenum, thus ventilation-only supply registers that are separate from the space	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71665
238360.027	Home Ventilating Institute	160.2(b)2Aii, Central Fan Integrated Ventilation Systems. Presumably, CEC intends to have the same CFI requirement for the multifamily path as for the single-family path. HVI recommends the same modifications in this case.	Staff incorporated the same CFI clarification language in 160.2(b)2Aii as are shown in 150.0(o)1B.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71665
238360.028	Home Ventilating Institute	150.0(o)1F Multifamily Requirements: This section should be deleted as it addresses multifamily dwelling unit ventilation, which is outside the scope of Section 150.0.	Multifamily requirements that were previously shown in 150.0(o)1F were deleted.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71665
238360.029	Home Ventilating Institute	160.2(b)2Aivb Dwelling Unit Mechanical Ventilation, system type: Please clarify the text within this section as follows to ensure that the "same ventilation system type" only pertains to the dwelling unit mechanical ventilation system. Otherwise, readers of this section may falsely assume that specifying exhaust ventilation for a bathroom would require all ventilation systems in the building to be exhaust: "...The dwelling unit mechanical ventilation system type installed throughout the building shall be only one of the following three types..."	Staff revised text in 160.2(b)2Aivb to say: "...shall use the same whole-dwelling unit ventilation system type.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71665

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238360.03	Home Ventilating Institute	<p>Dwelling unit mechanical ventilation fan efficacy, mandatory a. 150.0(o)2C and 160.2(b)2Biii Heat Recovery Ventilation (HRV) and Energy Recovery Ventilation (ERV) System Fan Efficacy. This section establishes maximum fan efficacy requirements for systems with heat or energy recovery as follows: "Systems with heat or energy recovery serving a single dwelling unit shall have a fan efficacy of ≤ 1.0 W/cfm as confirmed by HERS field verification in accordance with Reference Appendix RA3.7.4.4 (Note: 160.2(b)2Biii adds "or NA2.2.4.1.5 as applicable")."</p> <p>b. Section 160.2(b)2Aivb1: Balanced Ventilation. ...Systems with heat recovery or energy recovery that serve a single dwelling unit shall have a fan efficacy of ≤ 1.0 W/cfm;</p> <p>In these sections and wherever Title 24 Part 6 establishes a prescriptive fan efficacy for unitized ventilation systems, HVI recommends that CEC:</p> <p>i. Use the same convention for determining fan efficacy as is used by ASHRAE 90.1, the IECC, ENERGY STAR, and the industry at large: cfm/W. Please see the definitions section of this letter for more information.</p>	<p>Staff is not aware that use of the term fan efficacy or the w/cfm metric has been problematic for implementation or enforcement of the standards. The term fan efficacy and the w/cfm metric are used extensively throughout the CA energy Code, Reference appendices, ACM and in the performance compliance software, thus this comment represents a proposal for a change of significant magnitude which is not possible as a 15-day language revision, but staff could consider a proposal for revision to the 2025 update to the energy code. Since Watt/cfm expresses a value that is relevant to energy efficiency, and is applied to systems other than ventilation systems, staff would not likely change the metric to cfm/watt. However a change to use a different terminology could be considered if that could be shown to be beneficial.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?fn=2383608.DocumentContentId=71668
238360.031	Home Ventilating Institute	<p>In these sections and wherever Title 24 Part 6 establishes a prescriptive fan efficacy for unitized ventilation systems, HVI recommends that CEC:</p> <p>ii. Establish the static pressure difference at which fan efficacy is to be determined to align with what is referenced by ASHRAE 90.1-2019 Addendum a as follows: "Fan efficacy for fully ducted HRV or ERV, balanced, and in-line fans shall be determined at a static pressure difference not less than 0.2 in. of water for each airstream. Fan efficacy for other ducted fan systems shall be determined at a static pressure difference not less than 0.1 in. of water."</p>	<p>Verification protocols for fan efficacy for systems other than HRV/ERVs have not been proposed for the 2022 update to Title 24 Part 6. Staff cannot introduce new ratings requirements and verification protocols as revisions for the 15-day language, however staff could consider proposals for new ratings requirements and verification protocols for systems other than HRV/ERV systems as part of the 2025 Title 24 Part 6 rulemaking.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?fn=2383608.DocumentContentId=71668
238360.032	Home Ventilating Institute	<p>In these sections and wherever Title 24 Part 6 establishes a prescriptive fan efficacy for unitized ventilation systems, HVI recommends that CEC:</p> <p>iii. Clarify that the fan efficacy that is referenced shall be a rated value or shall be determined from rated values of airflow and power, with the option of interpolating between rated values. Approval of determining efficacy from rated values of airflow and power is necessary to ensure that available data from approved directories can be used to determine fan efficacy. Approval of interpolated values of rated airflow and power consumption when determining the efficacy at the design airflow rate encourages intelligent design to conserve energy (e.g., operating fans at lower speed where efficacy may be higher).</p>	<p>staff provided additional detail in the verification protocols for HRV/ERV systems in RA3.7.4.4 and NA2.2.4.1.5 that address the commenter's concern and allows for interpolation of rated values.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?fn=2383608.DocumentContentId=71668

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238360.033	Home Ventilating Institute	<p>iv. When determining the mandatory fan efficacy of a balanced ventilation system, establish that the airflow used should be the following, or interpolated from such values:</p> <ol style="list-style-type: none"> 1. For heat or energy recovery ventilators: "net supply airflow". HVI 920 defines net supply airflow as, "the gross supply airflow reduced by measured cross leakage. This is the actual amount of outdoor air delivered by the supply system of the unit and is used for sizing the equipment for the required ventilation rate." 2. For "integrated supply and exhaust ventilators" without heat or energy recovery: "net ventilation airflow." "Integrated supply and exhaust ventilator" is a product class that is recognized within HVI 920. Within HVI 920, "net ventilation airflow" is a rated parameter for "integrated supply and exhaust ventilators" that represents the "net quantity of outside airflow supplied." 3. For all other balanced systems (e.g., those employing separate but coordinated exhaust and supply units): the rated supply or exhaust airflow, as applicable. 	<p>Response to 1: staff revised the verification protocols in RA3.7.4.4 and NA2.2.4.1.5 to provide detailed direction for use of net supply airflow values given in the HVI directory.</p> <p>Response to 2: Verification protocols for fan efficacy for systems other than HRV/ERVs have not been proposed for the 2022 update to Title 24 Part 6. Staff cannot introduce new ratings requirements and verification protocols as revisions for the 15-day language, however staff could consider proposals for new ratings requirements and verification protocols for systems other than HRV/ERV systems as part of the 2025 Title 24 Part 6 rulemaking.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?tn=238360&DocumentContentId=71668
238360.034	Home Ventilating Institute	<p>In these sections and wherever Title 24 Part 6 establishes a prescriptive fan efficacy for unitized ventilation systems, HVI recommends that CEC:</p> <p>v. Clarify that when determining the fan efficacy of a heat or energy recovery ventilator or an "integrated supply and exhaust ventilator" without heat or energy recovery that the power consumed should be the total power consumption of the unit or interpolated from such values.</p>	<p>Verification protocols for fan efficacy for systems other than HRV/ERVs have not been proposed for the 2022 update to Title 24 Part 6. Staff cannot introduce new ratings requirements and verification protocols as revisions for the 15-day language, however staff could consider proposals for new ratings requirements and verification protocols for systems other than HRV/ERV systems as part of the 2025 Title 24 Part 6 rulemaking.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?tn=238360&DocumentContentId=71668
238360.035	Home Ventilating Institute	<p>Table 150.0-G and Table 160.2-G Kitchen Range Hood Airflow Rates (cfm) and ASTM E3087 Capture Efficiency (CE) Ratings According to Dwelling Unit Floor Area and Kitchen Range Fuel Type: Conceptually, HVI supports CEC's proposed requirements to establish a minimum range hood capture efficiency (RHCE) with the option to comply using a proxy airflow during this cycle. However, CEC's RHCE targets were developed by LBNL assuming that the minimum RHCE should be determined based on the exposure for a person somewhere else in the home besides the kitchen (i.e., assuming that the home is a well-mixed zone). This approach can significantly underestimate the exposure for those in proximity to cooking – especially the exposure for the cook. Within this cycle, to provide adequate protection for the cook across all dwelling units, it is prudent to establish a minimum RHCE/proxy airflow that is at the higher end of the range that LBNL recommended based on dwelling unit size. HVI requests that CEC use the following values for RHCE and proxy airflow within this cycle. Please see TN 235643, "Home Ventilating Institute Comments - Response to CEC's Nov 3 Proposal to Establish Minimum Capture Efficiency for Range Hoods" and TN 236371, "HVI Comments on 2022 Energy Code Pre-Rulemaking," for a detailed justification supporting this recommendation:</p> <ul style="list-style-type: none"> • Electric cooking: RHCE ≥ 65% or airflow ≥ 160 cfm • Gas cooking: RHCE ≥ 80% or airflow ≥ 250 cfm 	<p>Staff disagrees with the comments and changes proposed. The airflow rates proposed for the 2022 kitchen range hood requirements were developed by LBNL researchers and take into account a proximity factor of two (2) which is protective for persons in close proximity to the kitchen cooktop. Staff notes that the comment has proposed a reduction in stringency for CE and airflow in dwelling units 1,000 sqft or less which is less protective not more protective for dwelling unit occupants. Further, requiring higher ventilation rates than recommended by research can be expected to consume additional energy by incurring additional fan energy and unnecessarily exhausting large amounts of conditioned air.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?tn=238360&DocumentContentId=71668

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238360.036	Home Ventilating Institute	Exception to 150.0(o)Giva: For multifamily dwelling units, the manual ON-OFF control shall not be required to be accessible to the dwelling unit occupant. [Note: this exception can be deleted since multifamily dwelling units are not within the scope of Section 150.0.]	Staff implemented the change to delete the exception from 150.0(o) since that exception is applicable only to multifamily dwellings.	6/21/2021	45-Day	http://efiling.energy.ca.gov/Efiling/GetFile.aspx?bc=238360&DocumentContentId=71669
238360.037	Home Ventilating Institute	150.0(o)1Gv and 160.2(b)2Avie Airflow Measurement of Local Mechanical Exhaust by The System Installer: a. This section should be expanded to address airflow verification for range hoods that comply with Table 150.0-G or 160.2-G using an RHCE rating. The following modification is offered for this scenario: ...The airflow required by Section 150.0(o)1G [160.2(b)2Avi] is the quantity of indoor air exhausted by the ventilation system as installed in the dwelling unit. For range hoods using a rated range hood capture efficiency to comply with Table 150.0-G, the airflow required is the rated airflow used to determine the specified range hood model's rated capture efficiency. ...	Staff agrees with the suggested change and made substantially similar changes to the 45-day language.	6/21/2021	45-Day	http://efiling.energy.ca.gov/Efiling/GetFile.aspx?bc=238360&DocumentContentId=71669
238360.038	Home Ventilating Institute	b. Section 150.0(o)1Gva and 160.2(b)2Avie1 are unnecessarily restrictive in that they only permit measurement of airflow rates at inlet and outlet terminals/grilles. In addition to these locations, ASHRAE 62.2 and ANSI/RESNET/ICC Standard 380 both permit airflow measurements performed in accordance with manufacturer instructions. For example, on-board diagnostic equipment that can be used to verify the ventilation system in-situ airflow rate is now provided by some manufacturers and should be approved for field verification of airflow where such equipment meets the minimum performance specifications required for airflow verification equipment in the Reference Residential Appendices. Such recognition would incentivize product innovation and encourage manufacturers to provide equipment that is capable of self-diagnosis, while potentially reducing costs and time required for builders and verifiers to demonstrate compliance with the energy code. The following modification is offered to Section 150.0(o)1Gva and Section 160.2(b)2Avie1 to accomplish this objective. A similar change is recommended for Section 160.2(b)2Avie1. Additionally, please see the correlating proposed modifications to Reference Residential Appendices RA 3.7 within Section IV of this letter.	The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. CEC staff understands the proposal inappropriately delegates authority for determining field verification compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.	6/21/2021	45-Day	http://efiling.energy.ca.gov/Efiling/GetFile.aspx?bc=238360&DocumentContentId=71669

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238360.039	Home Ventilating Institute	c. These sections should be expanded to permit the use of manufacturer duct sizing tools when such tools are certified to the Energy Commission by the manufacturer to size the system in compliance with HVI 920. The following modification is offered to Section 150.0(o)1Gv for this scenario. A similar change is recommended for Section 160.2(b)2Avie1.	The comment proposes that ventilation systems be exempt from following already established methods for installer field verification that rely on direct measurement of airflow or use of the ASHRAE 62.2 prescriptive duct sizing table. CEC staff understands the comment instead inappropriately proposes to delegate authority for determining compliance with the installer airflow measurement requirements to the whim of the manufacturer by allowing use of duct sizing technology that is unknown to CEC staff, and is not regulated by the CA Energy Code. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals for new HERS field verification protocols, or for new technologies that could be regulated by Title 24, Part 6 as part of the 2025 update to the California energy code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/getfile.aspx?en=238360&DocumentContentId=71669
238360.04	Home Ventilating Institute	150.0(o)1Gvi Sound Ratings for Local Mechanical Exhaust. This section should be modified to ensure that kitchen range hoods are rated for sound at any airflow that is no less than 100 cfm. The word "difference" is also inserted to clarify that the static pressure rating point is really a differential static pressure; use of the term "difference" is consistent with ASHRAE 90.1-2019 Addendum a. The following modification is offered to address these recommendations. This modification would align the Section 150.0(o)1Gvi exception with the Section 160.2(b)2Avif exception: EXCEPTION to Section 150.0(o)1Gvi: Kitchen range hoods may be rated for sound at 100 cfm at a static pressure difference determined at working speed as specified in HVI 916 section 7.2. Alternatively, if CEC desires to retain the reference to 100 cfm, please consider the following language to ensure that the working speed exception may be applied at airflows exceeding 100 cfm: EXCEPTION to Section 150.0(o)1Gvi: Kitchen range hoods may be rated for sound at no less than 100 cfm at a static pressure difference determined at working speed as specified in HVI 916 section 7.2.	Staff implemented the change to section 150.0(o)1Gvi to require rating at "no less than" the minimum airflow required by Section 150.0(o)1G. Staff implemented the change to the EXCEPTION to Section 150.0(o)1Gvi to state: Kitchen range hoods may be rated for sound at "no less than 100 cfm" at a static pressure determined at working speed as specified in HVI 916 section 7.2.	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/getfile.aspx?en=238360&DocumentContentId=71669

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238360.041	Home Ventilating Institute	150.0(o)1H and 160.2(b)2Avii Airflow Measurement of Dwelling Unit Ventilation. These sections are unnecessarily restrictive in that they only permit measurement of airflow rates at inlet and outlet terminals. In addition to these locations, ASHRAE 62.2 and ANSI/RESNET/CC Standard 380 both permit airflow measurements performed in accordance with manufacturer instructions. For example, on-board diagnostic equipment that can be used to verify the ventilation system in-situ airflow rate is now provided by some manufacturers and should be approved for field verification of airflow where such equipment meets the minimum performance specifications required for airflow verification equipment in the Reference Residential Appendices. Such recognition would incentivize product innovation and encourage manufacturers to provide equipment that is capable of self-diagnosis, while potentially reducing costs and time required for builders and verifiers to demonstrate compliance with the energy code. The following modification is offered to Section 150.0(o)1H to accomplish this objective. A similar change is recommended to Section 160.2(b)2Avii.	The comment proposes to exempt ventilation systems from existing HERS field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. CEC staff understands the proposal inappropriately delegates authority for determining compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. Procedures for field verification of the installed performance of these ventilation systems are already available in the California Title 24 residential and nonresidential appendices, thus addition of additional verification procedures or technologies are not necessary. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new technology or new HERS field verification protocols as part of the 2025 update to the California energy code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238360&DocumentContentId=71666
238360.043	Home Ventilating Institute	150.0(o)1I Sound Ratings for Dwelling Unit Ventilation Systems. This section requires dwelling unit ventilation systems to be rated for sound "at no less than the minimum airflow rate required by Sections 150.0(o)1C or 150.0(o)1E as applicable." However, there is no text in Section 150.0(o)1E. Please clarify what is meant by this reference.	The reference to Section 150.0(o)1E was deleted since the multifamily requirements formerly given in that section was moved to the multifamily section of the standards.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238360&DocumentContentId=71666
238360.044	Home Ventilating Institute	150.0(o)1J and 160.2(b)2Aix Label for Dwelling Unit Ventilation System On-Off Control. The text for the dwelling unit ventilation system on-off control has been modified as follows: "This switch controls the indoor air quality ventilation for the home. Leave it switch in the "on" position at all times unless the outdoor air quality is very poor." HVI supports CEC's intention to clearly communicate the function and proper operation of the dwelling unit ventilation system control. However, HVI cautions that adding words to this already cumbersome label is likely to increase the chances that occupants will consider it an eyesore and will remove it. HVI questions whether the additional phrases "switch in the" and "position at all times" proposed by CEC will add sufficient clarity to justify the increased risk of removal by the occupant, especially when the same meaning can be derived from the current label without this additional text.	2022 Title 24 Part 6 updates to sections 150.0(o)1J and 160.2(b)2Aix provide additional clarity about the meaning of information CEC staff intend to be communicated by the the label. The allowance for use of equivalent text remains available, thus the clarifications to this label language will serve to aid in determining equivalence.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238360&DocumentContentId=71666

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238360.045	Home Ventilating Institute	150.0(o)1K and 160.2(b)2Ax Combustion Air and Compensating Outdoor Air or Makeup Air. "Atmospherically vented" is not defined within Title 24 Chapter 6, ASHRAE 62.2, or the California Mechanical Code. Please consider defining "atmospherically vented" or using terms that are consistent with terms used in the California Mechanical Code for this appliance class.	The term "atmospherically vented" is used but not defined in both ASHRAE Standard 62.2 and in Title 24, Part 4 (the California Mechanical Code). The 2008 Title 24 Part 6 update and all subsequent updates to Title 24 Part 6 have adopted by reference ASHRAE 62.2 section 6.4 requirements for combustion and solid fuel burning appliances that uses the term atmospherically vented, thus the term atmospherically vented is not a new term in the proposed 2022 Title 24, Part 6 express terms. Staff relies on ASHRAE 62.2 for requirements that are adopted by reference that use this terminology, thus staff does not propose to introduce a new definition for atmospherically vented in the 2022 express terms.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?h=238360&DocumentContentId=71669
238360.046	Home Ventilating Institute	150.0(o)2A Dwelling Unit Ventilation Airflow Performance. This section references Sections 150.0(o)1E and 150.0(o)1F. However, there is no text in Section 150.0(o)1E, and Section 150.0(o)1F should be deleted as it addresses multifamily dwelling unit ventilation, which is outside the scope of Section 150.0. Please clarify what is meant by these references.	References to 150.0(o)1E and 150.0(o)1F were deleted in the 15-day language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?h=238360&DocumentContentId=71669
238360.047	Home Ventilating Institute	150.0(o)2B and 160.2(b)2Bii Kitchen Local Mechanical Exhaust - Vented Range Hoods. This section establishes the field verification requirements for range hoods, including the requirement to verify the rated airflow where the airflow is used to comply with Section 150.0(o)1G (and 160.2(b)2Avi) requirements. This text should be modified to clarify that in certain cases, the airflow must be verified at a static pressure difference of 0.25 in. of water, depending on the Section 150.0(o)1Gv (and 160.2(b)2Avie) compliance method selected by the installer. The following modification is offered in this regard. A similar change is recommended for Section 160.2(b)2Bii. 150.0(o)2B ... confirm the model is rated by HVI or AHAM to comply with the following requirements: i. The minimum ventilation airflow rate as specified in by Section 150.0(o)1G, or alternatively the minimum capture efficiency as specified by Section 150.0(o)1G. If the prescriptive duct sizing method in 150.0(o)1Gvb is used by the installer to verify the airflow value, then the rated airflow value shall be verified using an approved directory at a static pressure difference of 0.25 in. of water. If the manufacturer's sizing instruction method in 150.0(o)1Gvc is used by the installer to verify the airflow value, then visual inspection shall be used to verify that the installed system conforms with the duct length, diameter, and number of elbows used within the manufacturer's sizing instructions, that	The field verification requirements for installers are different than the field verification requirements for HERS Raters. The comment assumes incorrectly that use of duct inspection utilizing the prescriptive duct sizing table 150.0-H will be used by HERS Raters. The comment also assumes incorrectly that the use of manufacturer duct design criteria will be used by HERS Raters. Staff does not intend that HERS verification use inspection of installed duct systems because the ventilation ducts are not always accesible at final inspection. Refer also to previous comment on use of manufacturer's design criteria: The comment proposes to exempt ventilation systems from existing HERS field verification and proposes to instead allow demonstrate field verification compliance for those systems using vaguely described design crireria and software means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code. CEC staff understands the proposal inappropriately delegates authority for determining compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. Procedures for field verification of the installed performance of these ventilation systems are already available in the California Title 24 residential and nonresidential appendices, thus addition of additional verification procedures or technologies are not necessary. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus cannot be considered to be added to the proposed express terms at	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?h=238360&DocumentContentId=71669
238360.048	Home Ventilating Institute	150.2(b)1K and 180.2(b)4A Lighting. These sections require altered luminaires to meet the requirements of Section 150.0(k) (160.5(a)) and Table 150.0-A (Table 160.5-A). However, Section 150.0(k)1A (160.5(a)1A) has been amended to provide exceptions for compliance with Table 150.0-A (Table 160.5-A) in certain cases, including exhaust fan lighting. For consistency, please extend the same exceptions to these sections.	The commented sections - Section 150.2(b)1K and 180.2(b)4A - do not apply to exhaust fan lights (lighting). The sections apply to altered luminaires. (No need for the amendment as suggested.)	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?h=238360

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238360.049	Home Ventilating Institute	150.2(b)1L and 180.2(b)5A Mechanical Ventilation for Indoor Air Quality - Entirely New or Complete Replacement Ventilation Systems. Please clarify these sections, as they seem to require that a ventilation system's ducting be completely replaced any time the ventilation fan is replaced, regardless of the condition and utility of the duct system. This can result in a waste of materials and an unnecessary expense for a dwelling unit owner, as ventilation systems are regularly replaced without the need to replace existing ducting – which is often in good condition. Introducing unnecessary costs for replacement of a duct system that does not need to be replaced can be a barrier to a homeowner replacing an energy-intensive or poorly functioning ventilation system. A common example is replacement of an exhaust fan, though the same logic could be applied to a dwelling unit ventilation system. If the existing duct system meets the ventilation system manufacturer's requirements and is still in good condition, replacement should not be required. Cleaning may be required if excessive amount of dust, debris or deposits reduce the cross-sectional area significantly. Please remove/modify these sections and leave the determination of whether ducting needs to be replaced or cleaned to the discretion of the owner and contractor. If CEC believes that additional prescriptive requirements are necessary to determine if existing ducts are adequate, then the following are offered for consideration as alternatives to replacement: cleaning (if necessary), sizing to meet manufacturer requirements, and/or testing to confirm leakage thresholds:	Staff revised the language to clarify and provide definitions for what is meant by an entirely new or complete replacement ventilation system.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71668
238360.05	Home Ventilating Institute	170.2(c)3 Dwelling Unit Space Conditioning Systems. Despite its title of "dwelling unit space conditioning systems", this section contains prescriptive requirements for dwelling unit ventilation systems. HVI recommends removing the ventilation system requirements from this section and placing them in a separate section that pertains to ventilation. As currently organized, the ventilation provisions would be easily overlooked.	Staff revised the title for the section to indicate it is applicable to both space conditioning systems and ventilation systems.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71668
238360.051	Home Ventilating Institute	170.2(c)3A Heating System Type (prescriptive fan efficacy requirements). Despite its title of "heating system type", this section establishes prescriptive fan efficacy requirements for balanced ventilation systems. As noted previously, HVI recommends removing the ventilation system requirements from this section and placing them in a separate section that pertains to ventilation. As currently organized, the ventilation provisions would be easily overlooked. Additionally, it is not clear why there are prescriptive requirements for fan efficacy of balanced ventilation systems without heat recovery in some climates but not others. Because the climate zone does not affect the ventilation rate or run time of multifamily dwelling unit ventilation systems, the maximum prescriptive fan efficacy for these systems should be the same across all climate zones. With respect to establishing prescriptive fan efficacy requirements for balanced ventilation systems without heat or energy recovery, HVI recommends that CEC:	Staff appreciates the comment. Fan efficacy requirements for ventilation systems have been relocated to the ventilation section for the 15-day language draft.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238360&DocumentContentId=71668

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238360.052	Home Ventilating Institute	170.2(c)3Bv ERV or HRV, section location and requirements. The prescriptive requirements for ERVs and HRVs (H/ERVs) are miscategorized within the "Space Heating and Space Cooling" section. As noted previously, HVI recommends removing the ventilation system requirements from this section and placing them in a separate section that specifically addresses ventilation. As currently organized, the ventilation provisions would be easily overlooked.	Staff revised the title for the section to indicate it is applicable to both space conditioning systems and ventilation systems.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71669
238360.053	Home Ventilating Institute	Additionally, HVI recommends that CEC expand the prescriptive path requirements for H/ERVs to all climate zones and multifamily building types where they were demonstrated by the CASE team to be cost effective. There were a 6 multifamily building prototypes and location combinations for which the specification of H/ERVs was determined to be cost effective but for which neither CASE nor CEC proposed to require H/ERVs within the prescriptive path. For example, the green highlighted cells below illustrate the climate zones where using H/ERVs in CASE's prototype multifamily buildings was determined by CASE to be cost effective (i.e., have a benefit-to-cost (BC) ratio exceeding 1). It is clear from this table that there are several scenarios where the BC ratio far exceeds one (CASE's criterion for cost-effectiveness), but an H/ERV is not required because CASE's criteria for this measure was that ALL prototypes within a climate zone must have a BC ratio > 1 for CASE to propose a requirement for ANY multifamily dwelling units within the climate zone. This blunt, macro-level approach is too coarse, as it unnecessarily leaves energy savings on the table simply because of the organizational approach chosen. For other system types, CEC has established a precedent of having more granular requirements where warranted (e.g., Section 170.2(c)3A has different requirements for multifamily space conditioning systems based on the number of stories in the multifamily building). In determining prescriptive path	this comment is not in agreement with the multifamily CASE report that was presented at public workshops and presented in 45-day language. Staff could consider this proposal with the 2025 update to the Energy Code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71669
238360.054	Home Ventilating Institute	170.2(c)3Bv ERV or HRV, verification when serving single dwelling units. Bullet "a" of this section requires single dwelling unit H/ERVs to be field verified in accordance with NA2.6. However, there does not appear to be an NA2.6. Should this reference NA2.2.4.1.5 instead? Also, as noted previously within this comment, HVI recommends changing the fan efficacy metric to units of cfm/W to align with the common industry use of this term (California's metric of W/cfm is generally referred to as "specific fan power"). If CEC maintains its current metric, the HVI recommends change the fan efficacy requirement wording in this section to match 170.2(c)3Ai which is less confusing than the wording used in this Section:	See staff previous responses to HVI comments with regard to use of the terminology fan efficacy and the performance metric w/cfm. Staff revised the reference to field verification for HRV/ERV to NA2.2.4.1.5.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71669
238360.055	Home Ventilating Institute	170.2(c)3Bv ERV or HRV, verification when serving multiple dwelling units. Bullet "b" of this section requires H/ERVs serving multiple dwelling units to have "fan power meeting the requirements of Section 170.2(c)." This section is very large, and its fan power requirements are dispersed across multiple subsections. For this reason, it would be helpful to reference the applicable subsections, as follows:	Staff appreciates the comment. The 15-day language has been updated to reference the specific subsection.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238360&DocumentContentId=71669

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238360.056	Home Ventilating Institute	<p>RA3.7 and NA2.2 Field Verification and Diagnostic Testing of Mechanical Ventilation Systems. These sections are unnecessarily restrictive in that they only permit measurement of airflow rates at inlet and outlet terminals using portable measurement devices. In addition to these locations, ASHRAE 62.2 and ANSI/RESNET/ICC Standard 380 both permit airflow measurements performed in accordance with manufacturer instructions. For example, integrated on-board diagnostic equipment that can be used to verify the ventilation system in-situ airflow rate is now provided by some manufacturers and should be approved for field verification of airflow where such equipment meets the minimum performance specifications required for airflow verification equipment in the Reference Appendices. Such recognition would incentivize product innovation and encourage manufacturers to provide equipment that is capable of self-diagnosis, while potentially reducing costs and time required for builders and verifiers to demonstrate compliance with the energy code. The following modifications are offered to Sections RA3.7.2 and RA3.7.3 to accomplish this objective. Similar changes are recommended for Sections NA2.2.2 and NA2.2.3:</p>	<p>The comment proposes to exempt ventilation systems from existing HERS field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. CEC staff understands the proposal inappropriately delegates authority for determining compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. Procedures for field verification of the installed performance of these ventilation systems are already available in the California Title 24 residential and nonresidential appendices, thus addition of additional verification procedures or technologies are not necessary. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new technology or new HERS field verification protocols as part of the 2025 update to the California energy code.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/Getfile.aspx?fi=238360&DocumentContentId=71666
238360.057	Home Ventilating Institute	<p>RA3.7.4.3 and NA2.2.4.1.4 Kitchen Local Mechanical Exhaust - Vented Range Hood Verification. Section 150.0(o)1Gv (and Section 160.2(b)2Avie) require the kitchen exhaust airflow to be verified by the installer using an in-situ airflow testing or a prescriptive duct sizing method. If using the prescriptive duct sizing method, the rated airflow at 0.25 in. of water must be used to comply. If the prescriptive duct sizing method is used for complying with Section 150.0(o)1Gv (or Section 160.2(b)2Avie), then the HERS Rater should also reference the kitchen range hood airflow at 0.25 in. of water when verifying the airflow within an approved directory. To ensure that this is the case, the following modification is offered. A similar modification is recommended for NA2.2.4.1.4:</p>	<p>The field verification requirements for installers are intended to be different than the field verification requirements for HERS Raters for these systems. The comment assumes incorrectly that use of duct inspection utilizing the prescriptive duct sizing table 150.0-H will be used by HERS Raters. Staff does not intend that HERS verification use inspection of installed duct systems because the ventilation ducts are not always accessible at final inspection, whereas the duct system is available to the installer of the system. Procedures for field verification of the installed performance of these ventilation systems are already available in the California Title 24 residential and nonresidential appendices, thus addition of additional verification procedures or technologies are not necessary. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new HERS field verification protocols as part of the 2025 update to the California energy code.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/Getfile.aspx?fi=238360&DocumentContentId=71666

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238360.058	Home Ventilating Institute	RA3.7.4.4 and NA2.2.4.1.5 Heat Recovery Ventilation (HRV) or Energy Recovery Ventilation (ERV) Rated Performance Verification. This section details the H/ERV performance information that must be field verified, including verification of rated performance for fan efficacy or sensible recovery efficiency within HVI's directory or within another approved directory. Because each H/ERV is likely to have several rated performance points within the HVI directory, HVI requests that CEC modify Section RA3.7.4.4 as follows to provide the verifier with the specificity needed to verify the desired performance parameter. A similar modification is recommended for NA2.2.4.1.5.	Staff modified the procedure in RA3.7.4.4 and NA2.2.4.1.5 to use the model details in the energy ratings in the in the HVI or other CEC-approved directory and have allowed use of interpolation. Staff understands that the revisions to the 15-day language address the comment in terms of methodology for determining the value from the directory used for determining compliance. However staff has not incorporated use of manufacturer duct sizing methods. The comment assumes incorrectly that the use of manufacturer duct design criteria will be used by HERS Raters. Thus the comment proposes to exempt ventilation systems from existing HERS field verification and proposes to instead allow demonstrate field verification compliance for those systems using vaguely described design criteria and software means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code. CEC staff understands the proposal inappropriately delegates authority for determining compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. Procedures for field verification of the installed performance of these ventilation systems are already available in the California Title 24 residential and nonresidential appendices, thus addition of additional verification procedures or technologies are not necessary. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tn=238360&DocumentContentId=71668
238360.059	Home Ventilating Institute	NA7.18.1.1.1 Dwelling Unit Ventilation Acceptance - Construction Inspection. Bullet "a" requires the verifier to document that the dwelling unit ventilation system "is designed to provide a fixed minimum outside air when the unit is operating." This should be expanded to include variable dwelling unit ventilation systems that are permitted by CEC. The following modification is offered for this purpose: "...is designed to provide a fixed minimum outside air when the unit is operating."	Staff made the change to delete the term fixed minimum.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tn=238360&DocumentContentId=71668
238362.001	Vertiv	Vertiv supports adopting the current draft language as it is written in the Express Terms.	The analysis provided on the docket shows energy inequivalence to alternative prescriptive pathways and therefore is unable to adopt the 45day draft version of the language. The Commission has declined to adopt language regarding pumped refrigerant economizers.			
238362.002	Vertiv	[T]he report contained in [TN #238233] creates barriers to this market flexibility and is based on incomplete and flawed analysis.	Staff disagrees with comment and was not provided with an alternate analysis to support this claim. The Commission has declined to adopt language regarding pumped refrigerant economizers.			
238362.003	Vertiv	[TN #238233] continually and mistakenly states that Vertiv's proposal showed the pumped refrigerant economizer to be energy equivalent to a water economizer. Rather, Vertiv's proposal showed the pumped refrigerant economizer to be more efficient than a baseline water economizer system. As such, the basis for the Comment's additional metric of minimum equipment efficiency values is flawed because federally-minimum compliant equipment could still show energy savings versus a baseline water economizer.	Staff disagrees with this comment. Prescriptive pathway analysis must show a baseline to baseline comparison using the current CA standards. The Commission has declined to adopt language regarding pumped refrigerant economizers.			

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238362.004	Vertiv	[T]he following aspects of [TN #238233] inappropriately move the target only for pumped refrigerant economizers: First, the Comment seeks to isolate the proposed refrigerant cooling system's economizer-only performance to equalize the overall system performance during non-economizer mode operating hours throughout the year. This is contrary to the Commission's preferred method of documenting a proposed submeasure's cost-effectiveness and energy efficiency by using CBECC-Com (California Building Energy Code Compliance), or another approved software method to "perform the annual energy analysis comparing its energy efficiency relative to the 2016/2019 Standards."	<p>Staff disagrees with this comment. Moving the target for PRE is to equalize energy savings with 2022 baseline of alternative prescriptive pathways. TN#238233 seeks to compare a baseline CRAC unit with a PRE with a baseline CRAH unit with a water economizer. This is in line with with the CEC's method of measuring energy equivalency to be agnostic in equipment technology focusing on the energy saved. TN#238233 uses CBECC-Com. Accepting the 45 day draft language potentially allows other manufacturers to develop a PRE system with a less than efficient COP from what was proposed by Vertiv, thus reducing the expected energy savings. Prescriptive pathway is not written to accomodate a specific manufacturers energy savings, but the technology itself using minimally compliant components.</p> <p>The Commission has declined to adopt language regarding pumped refrigerant economizers.</p>			
238362.005	Vertiv	Next, [TN #238233] includes a request to "equalize" the performance of one component, the evaporator fan, between the baseline water economizer system and the proposed pumped refrigerant economizer system to negate the inherent performance advantage of the entire proposed refrigerant cooling system. This approach is impossible to justify because the evaporator fan is an integral part of the overall system. Further, this approach is wholly inappropriate because the refrigerant economizer can only be used with the 2 modeled evaporator fan and cannot be installed with any other cooling system. As such, the proposed metric does not "level the playing field" with respect to other technologies but instead creates negative impacts to artificially disadvantage the proposed pumped refrigerant technology. This runs counter to Title 24's technology-neutral intent.	<p>Staff disagrees with this comment. Evaporator fan energy was set to the baseline of the 2019 standards which is equal for both sides since these are both baselines. This correction in the analysis promotes the standards to be technology-neutral where extra energy savings for above minimally compliant equipment is not provided to any system type.</p> <p>The Commission has declined to adopt language regarding pumped refrigerant economizers.</p>			
238362.006	Vertiv	[TN #238233]'s analysis only uses the annualized energy savings data provided with Vertiv's proposal, which includes a 40°F economizer threshold for an equivalent water economizer, as taken from 2019 Title 24 Energy Code. [TN #238233]'s use of this data compared to a baseline water economizer with a 50°F economizer threshold used in the CASE proposal for 2022 Title 24 generates a grossly misleading bar chart in Figure 1 because the data sets shown by that chart do not compare performance at the same economizer temperature threshold. [...] As a result, Vertiv's proposal reflects a lower number of hours in 100% economizer mode (because it is capped at 40°F), whereas the compared baseline water economizer data captures more hours in 100% economizer mode up to 50°F. To generate this data, the [TN #238233] had to have made unsubstantiated assumptions regarding the performance of Vertiv's equipment at outside temperatures between 40°F and 50°F. [TN #238233] incorrectly assumed, without consulting Vertiv, that Vertiv's energy model reflected energy consumption at 100% economizer mode up to 50°F.	<p>Staff disagrees with comment. TN#238233 mentions a 50deg OA was used for PRE for the analysis.</p> <p>The Commission has declined to adopt language regarding pumped refrigerant economizers.</p>			

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238362.007	Vertiv	<p>[TN #238233] proposes to add an efficiency metric to the refrigerant economizer prescriptive requirement: the AHRI design point representative only of one, single test point in 100% compressor cooling mode at one summer outdoor air condition. However, this AHRI metric is intended as an equalizer for manufacturers to certify their products under the AHRI Datacom Cooling Certification Program and does not account in any way for the cooling equipment's annualized performance. See https://www.ahrinet.org/App_Content/ahri/files/Certification/ResourcesForms/WHY_CERTIFY_FLYER-2020.pdf. Additionally, this AHRI metric, when applied as intended, does not indicate whether an economizer is included in the product to which the metric is applied, which directly conflicts with the Commenter's original desire to divorce the economizer mode performance from the cooling mode performance.</p>	<p>Staff disagrees with this comment. The analysis provided shows an gap in energy performance and in order to meet this gap, the added NSenCOP table would ensure the equipment performs equivalent to the alternatives. The NSenCOP requirement plus the PRE system would both be needed to comply.</p> <p>The Commission has declined to adopt language regarding pumped refrigerant economizers.</p>			
238362.008	Vertiv	<p>[TN #238233]'s proposed addition of a table of "Minimum Pumped Refrigerant Economizer CRAC Net Sensible COP by Climate Zone" should not be considered for the following reasons: The values in the proposed "Minimum Pumped Refrigerant Economizer CRAC Net Sensible COP by Climate Zone" table reference the AHRI 1360, 2017 Standard for Performance Rating of Computer and Data Processing Room Air Conditioners, which identifies the test inputs including an External Static Pressure (ESP) = 0.2" for Downflow units and MERV8 filters. By contrast, the energy model included in Vertiv's proposal was run with an elevated ESP = 0.75" to account for additional simulated ductwork for air distribution or containment, and it included higher efficiency MERV13 filters in compliance with 2019 California Green Building Standards Code Section 5.504.5.3 Filters, 2019 Title 24 Section 120.1(c) 1.B., and 2019 California Mechanical Code Chapter 4 Section 401.2. These inputs used in Vertiv's proposal are more conservative than what AHRI 1360 requires. This means that [TN #238233] built a table of values that inaccurately assumes the inputs to the Vertiv data set were taken from the Test Method described within AHRI 1360. This inaccuracy makes invalid any attempt to establish a tie between the [TN #238233] proposed minimum efficiency values and AHRI Standard 1360.</p>	<p>CEC disagrees with commenter. MERV 13 filters are not required for covered processes and 140.9(a)2 sets a fan power limit which is irrespective of filtration.</p> <p>The Commission has declined to adopt language regarding pumped refrigerant economizers.</p>			
238362.009	Vertiv	<p>The values in the proposed table also assume an 85°F Return Air temperature, which is the input from AHRI Standard 1360; however, the report attempts to justify an elevated economizer temperature for refrigerant economizers by increasing the Return Air temperature to 95°F. [TN #238233] changes their expectation of an appropriate design Return Air temperature from 85°F when making the argument for AHRI 1360-based minimum efficiency levels and then moves up to 95°F when arguing that pumped refrigerant economizers should have an economizer threshold up at 65°F. This change is inappropriate and results in a metric target that contains more than one value for the same input, with which no product can comply.</p>	<p>CEC Staff disagrees with the commenter. 95degF return air was just to show the possibility of 100% economizing at higher return air temps with manufacture public data. The AHRI 1360 NSenCOP would be calculated based on the standard inputs described in AHRI 1360.</p> <p>The Commission has declined to adopt language regarding pumped refrigerant economizers.</p>			

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238362.01	Vertiv	Because the [TN #238233] proposed minimum efficiency values only take Full Load operation into account, the Comment completely throws out any annual energy performance that has been provided to the Commission for a true evaluation of the pumped refrigerant economizer proposal and ignores the process that the Commission employs to evaluate submeasure proposals. The Comment's calculated NSenCOP values eliminate any recognition of the proposed pumped refrigerant economizer's performance in economizer mode.	CEC Staff disagrees with commenter. TN#238233 took into account part load operation using TDV at an annual basis. This accounts for full and partial load on a per hour basis. The Commission has declined to adopt language regarding pumped refrigerant economizers.			
238362.011	Vertiv	[TN #238233]'s proposed acceptable minimum proposed efficiency level for Climate Zone 7 is below the ASHRAE 90.1-2019 minimum NSenCOP efficiency value = 2.36 for this size unit. The ASHRAE 90.1-2019 minimum efficiency values are well-reported and widely expected to be adopted within the next 18 months by the U.S. Department of Energy ("DOE") for federal appliance energy conservation standards applicable to the products at issue here. See https://www.federalregister.gov/documents/2021/04/21/2021-08203/preliminary-analysis-regarding-energy-efficiency-improvements-in-ansiashraeies-standard-901-2019 .	The Commission has declined to adopt language regarding pumped refrigerant economizers.			
238362.012	Vertiv	The proposed acceptable minimum efficiency level for Climate Zone 1 is more than double the ASHRAE 90.1-2019 minimum NSenCOP efficiency value = 2.36 for this size of unit, which has been well-reported and is widely expected to be adopted by the DOE later this year, as noted in the Federal Register entry linked above. Imposing such an elevated minimum value discourages manufacturers from developing innovative, emergent technologies. The minimum efficiency values within ASHRAE 90.1 are evaluated with each 3-year cycle and generated with input from industry experts to set aggressive targets for manufacturers to develop new and increasingly efficient technologies. Increasing these minimums by a factor of 200% moves that already intentionally aggressive target and creates an unnecessarily heavy burden on innovators. Further, this disrupts ASHRAE's carefully developed and well documented industry guidance that is specifically established to balance aggressive targets with flexibility for new and promising technologies.	Staff disagrees with commenter. These values ensure that the PRE will consume equivalent energy with other alternatives based on TDV. An alternative to this would be to not allow any installations in Climate Zone 1. The Commission has declined to adopt language regarding pumped refrigerant economizers.			
238362.013	Vertiv	If the metrics proposed in this table are approved, they will continue to push data center designers to favor the use of one of the two currently listed prescriptive economizer options, which are not ideal technologies for all data centers. For example, air economizers provide optimum payback only when outdoor air conditions are pollutant and smog-free so as to not degrade the performance of the servers within the data centers utilizing them, which has been a genuine concern for residents of California in the past several years. [...] Additionally, data centers that use water cooled systems are gaining attention for the impacts of that use. [...] By contrast, pumped refrigerant economizers are not subject to these constraints or concerns because they do not depend on air quality and also do not consume water.	Although staff understands commenter's concerns about CA's air and water issues, staff have worked with this commenter and reached an agreement to continue refining the appropriate regulatory language and metrics in the 2025 code cycle. For this reason, staff have determined to not adopt language regarding pumped refrigerant economizers.			

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238362.014	Vertiv	Vertiv agrees with the statement in the Comment that, “[a]chieving full refrigerant economizer conditions at higher outdoor temperatures can be achieved by increasing the equipment sizing capacity at design conditions,” and “[i]ncreasing the available heat rejection capacity allows pumped refrigerant economizers to operate in full economizing mode at higher outdoor dry-bulb temperatures, thereby reducing energy use.” However, Vertiv believes it important to consider that there are real design, cost, and space consequences for such design changes. For example, TN #238317 explains that data center owners would need to install “excess units” or “oversized equipment” only to meet this elevated economizer temperature rather than deliver any other benefit to the owner/operator.	This approach of including PRE into the prescriptive alternative only requires the energy equivalency to be equal and cost is not evaluated. The Commission has declined to adopt language regarding pumped refrigerant economizers.			
238362.015	Vertiv	For the reasons set out above, Vertiv believes that Comment #238233 includes incomplete and flawed analysis, and respectfully requests that the Commission take these shortcomings into account. Additionally, Vertiv believes that this Comment’s proposed addition of a table of “Minimum Pumped Refrigerant Economizer CRAC Net Sensible COP by Climate Zone” is inappropriate, inconsistent with the Commission’s submeasure proposal process, and should not be considered. Vertiv respectfully requests that the Commission accept the current draft language as it is written in the Express Terms.	Staff disagrees with comment. The analysis uses Vertiv’s modeling and corrected flaws in the modelling approach to ensure a fair comparison to alternative 2022 baselines. This is in line with CEC’s submeasure proposal process, and staff did not receive an alternative approach or data to disprove the analysis. Staff have worked with this commenter and reached an agreement to continue refining the appropriate regulatory language and metrics in the 2025 code cycle. For this reason, staff have determined to not adopt language regarding pumped refrigerant economizers.			
238364.001	AMCA International	AMCA thanks the CEC for accepting the request to update references to the 2018 version of ANSI/AMCA Standard 500-D, Laboratory Methods of Testing Dampers for Rating.	Staff appreciates the comment supporting the proposed amendment.			
238364.002	AMCA International	AMCA requests one additional change - that its three standards (ANSI/AMCA 208-18, ANSI/AMCA 210-16, and ANSI/AMCA 500-D-18) now referenced in Appendix 1-A under the section, “AMERICAN NATIONAL STANDARDS INSTITUTE”, be separated out from that section and instead be listed under a new section, “AIR MOVEMENT AND CONTROL ASSOCIATION”. AMCA’s opinion is that by making this change, it will be simpler for the user of the 2022 Energy Code to find the AMCA standards in Appendix 1-A that are referenced in the Code.	Staff appreciates this comment, but does not see this change to be simpler. The title of the document begins with ANSI/AMCA and is also written this way in the definitions of the standards.			
238364.003	AMCA International	By lowering the minimum FEI for VAV systems to 0.95, this requirement is now more consistent with ASHRAE 90.1-2019, Section 6.5.3.1.3. Just for keeping the code simpler, AMCA with its August 14, 2020 comment had supported the CASE team’s proposal of FEI > 1.00 for all in-scope fans. AMCA supports the direction taken by the CEC with this change.	Staff appreciates the comment supporting the proposed amendment.			
238364.004	AMCA International	A slight change was made in the 45-day language to Section 140.4(c)1, Fan Power Budget, by adding “...at the fan system design airflow...”. AMCA supports this change since it adds clarity and preciseness to the calculation of fan system electrical input power (Fan kW _{design,system}) determined per Section 140.4(c)1(B).	Staff appreciates the comment supporting the proposed amendment.			

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238365.001	CA Solar & Storage Association	Section 10-115(a)(3): The 45-day draft has removed the "equivalent" benefits language in the 2019 standards. Now, this section reads that the energy bill savings from the community solar program must be greater than the cost of the program to the building. Theoretically, a community solar program with a 20-year net benefit to the building of one dollar would satisfy this requirement. We believe that customers enrolled in community solar programs should receive significant savings and suggest the Commission amend the language accordingly.	Thank you for your comment. Section 10-115 provides an alternative compliance pathway for meeting the Energy Code's residential rooftop PV requirements. Staff recommended, and the Commission determined, that it was unnecessary to require a greater benefit-to-cost ratio for this alternative compliance pathway. Note, however, that the Commission's estimates of the benefits of rooftop PV conducted for the 2019 standards were extremely conservative; even given these conservative estimates, the Commission estimated a 2:1 benefit to cost ratio.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?ei=238365&DocumentContentId=71662
238365.002	CA Solar & Storage Association	Section 10-115(a)(4): We support the Commission adding a requirement to the community solar compliance option that allows building owners to unenroll in the community solar program by installing on-site solar. The section now states, "At the time of interconnection of that on-site solar electric generation system, all costs associated in the community shared solar and/or battery storage system shall cease." We assume this provision prevents community solar program administrators from charging properties unenrollment fees, and we request the Commission provide clarification in the building standards. Without a provision that explicitly prohibits unenrollment fees, we are concerned that high fees could prevent properties from unenrolling and installing on-site solar.	Thank you for the comment of support. Based on feedback, including this comment, the proposed regulations were updated in 15-day to include an express provision preventing Administrators from imposing penalties on buildings that choose to discontinue participation in community shared solar systems.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?ei=238365&DocumentContentId=71662
238365.003	CA Solar & Storage Association	<p>Section 10-115(a)(6): We ask the Commission to amend the locational requirement for the community solar compliance option. One tenet of community solar is that the installations be located in the communities they serve. At the Commission Business meetings on SMUD's SolarShares program in November 2019 and February 2020, the Commissioners expressed concern over the lack of locational requirements in Section 10-115, especially because faraway community solar systems would preclude resiliency benefits.</p> <p>The 45-day language has updated Section 10-115(a)(6) to read, "The community shared solar electric generation system and/or community shared battery storage system shall be located on a distribution system of the load serving entity providing service to the participating buildings." Our reading of this language would allow a home in Eureka, in PG&E's northern electric service territory, to be enrolled in a community solar farm 450 miles away in Santa Maria, in PG&E's southern territory. To ensure that community solar installations are located in the community of the homes they serve, we ask the Commission to amend the language in this section to read, "The community shared solar electric generation system and/or community shared battery storage system shall be located on the distribution system of the participating buildings."</p> <p>We also recognize the Commission may find our proposed language restrictive as the Commission wants the compliance</p>	This is too limiting. Solar farms may be zoned as industrial and local zoning laws may not allow them to be located near residential or commercial property. Smaller CS systems may be able to be located on carports or roofs of buildings near the development, but no applications have been submitted to the CEC for such CS systems; there would be no restriction on PV systems being located on the same distribution system. CSSA's national guidelines for CS systems do not recommend a limitation to the same distribution system as the participants.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?ei=238365&DocumentContentId=71662

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238365.004	CA Solar & Storage Association	Section 10-115(b)(3): We support the Commission adding a requirement that "applications from public agencies shall be submitted to the Energy Commission only after public review through at least one public meeting." We suggest that all utilities, whether public or private, that submit community solar applications should be required to allow for public review via public meetings, and ask the Commission to consider adding language accordingly.	California IOUs have indicated to date that they have no interest in being applicants to the CEC for approval of CS systems – if the CPUC changes rules to facilitate CS systems in IOU territories, applications for ECR programs to meet the CS requirements are expected to come from solar developers potentially in participation with builders.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238365&DocumentContentId=71662
238367.001	Harley Ellis Devereaux	I would like to voice my support for the proposed addition of refrigerant economizers to section 140.9 and 141.1 of CEC guidelines. Refrigerant economization has become very commonly used for data center applications but is often not addressed by the codes which requires design firms to make assumptions for compliance. As a design engineer I support the clarity this inclusion will bring to our design efforts.	Staff appreciates the comment.			
238367.002	Harley Ellis Devereaux	The proposed 10°F increase in water economization temperatures will eliminate or greatly oversize air cooled chillers with integral economizers for data center applications and may result in higher overall energy usage. To meet the economization requirements the chillers must operate at a higher leaving water temperature. While this approach is generally acceptable for data center applications, as chilled water temperatures increase the CRAH fans speeds increase to provide as much cooling capacity as possible. At some point the energy savings at the chillers is offset by the increased fan energy at the CRAHs. I recommend a study be performed to determine what chiller and CRAH performance results in the most efficient overall system before this temperature setpoint is increased. Changing the economizer temperature may result in higher overall energy usage if not studied appropriately	<p>The CASE Team provided analysis with much higher temperatures than the proposed. Staff does not understand the logic behind increased CRAH fan speeds consuming more energy when there is a maximum limit in the standards for fan power consumption.</p> <p>It should be noted that air-cooled chillers may not meet the definition of water economizers, which include evaporation of water. Note that the definition of water economizer was revised to be more clear.</p> <p>Additionally, an analysis was done to show that air-cooled chillers paired with a cooling tower would be able to serve as an options and was still cost effective.</p> <p>Finally, the analysis assumes that equipment sizing for a chilled water system including CRAH coils designed to operate at the elevated required temperatures so that there would not be an increase in fan energy.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238367&DocumentContentId=71668

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238368.001	Joshua C. Greene, A. O. Smith	<p>Overview</p> <p>In general, A. O. Smith is supportive of the Commission's 45-Day Express Terms proposal and appreciates the extensive work the Commission has done to both update its initial proposal, as well as incorporate the feedback and recommendations from stakeholders. A. O. Smith recognizes the key role that heat pump technology, and specifically heat pump water heaters (HPWHs) will play in achieving two important policy goals in the State of California – reducing the carbon footprint of residential and non-residential buildings and helping to manage the integration of increasing amounts of renewable energy given HPWHs unique ability to shift load and serve as thermal energy storage devices.</p> <p>Moreover, and consistent with the Commission's view, A. O. Smith similarly believes that as the State transitions to the increasing use of heat pump technology in its built environment, the marketplace will, among other things, need time to adjust; customer and builder acceptance will need to accelerate; flexibility in the form of limited exceptions for dual-fuel buildings should be maintained; and consistent incentives for the continued adoption and utilization of heat pump technology will need to be maintained over time to provide business certainty to all stakeholders.</p>	Staff appreciates the commenter's general support for the amended Energy Code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238368&DocumentContentId=71657
238368.002	Joshua C. Greene, A. O. Smith	<p>Electric Ready</p> <p>A. O. Smith is supportive of the Commission's proposal regarding prescriptive electric-ready requirements for single-family and multifamily buildings per Section 150.0(n) specifically as it relates to HPWHs. As stakeholders recognize – and consistent with a stepwise pragmatic building decarbonization pathway – constructing buildings to be electric-ready reduces costs over time as compared to more costly retrofit applications.</p>	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238368&DocumentContentId=71657
238368.003	Joshua C. Greene, A. O. Smith	<p>Heat Pump Water Heaters</p> <p>A. O. Smith is supportive the Commission's proposal to utilize HPWHs in the baseline for both the prescriptive and performance pathways for low-rise residential, high-rise multifamily and selected nonresidential occupancies with the following recommendations:</p> <p>Section 150.1(c)8 - the Commission should extend the HPWH baseline to Climate Zone 10 (CZ10) as proposed in its 15-Day Language and as presented by the Commission at its May 24, 2021 workshop as well as clarify if a point-of-use instantaneous electric water heater can be used for dwelling units with 1 bedroom or less.</p>	Staff agrees with the comment and the adopted language reflected this change	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238368&DocumentContentId=71657

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238368.004	Joshua C. Greene, A. O. Smith	Multi-family all-electric baseline – consistent with its comments to the Commission regarding an all-electric multifamily compliance pathway for domestic hot water heating1 A. O. Smith recommends that the Commission ensure any compliance measures adopted in the 2022 code pertaining to multifamily hot water generation continue to allow manufacturers the flexibility to innovate and design heat pump water heaters in a variety of ways to meet any proposed code requirement.	Staff appropriates the comment	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238368&DocumentContentId=71657
238368.005	Joshua C. Greene, A. O. Smith	Service Water Heating Systems A. O. Smith is supportive of the Commission's proposal regarding Service Water Heating Systems as outlined for Sections 140.4(k)8, 140.5(c), including the new requirement for school buildings less than 25,000 square feet. A. O. Smith would, however, recommend that the Commission allow flexibility on design requirements for HPWH systems to be utilized in those applications. A. O. Smith also commends the Commission for including a mandatory design requirement providing 120°F or less return water to boilers, which will allow condensing boilers to operate more efficiently and conserve energy. Lastly, A. O. Smith would recommend the following change for commercial boilers: Section 160.4 – consistent with the exceptions in Sections 120.6 and 120.9 respectively that reference "combustion efficiency" rather than "thermal efficiency", Section 160.4(e) should be amended to read: (e) Commercial Boilers EXCEPTION to Section 160.4(e)3: Boilers with steady state full-load thermal combustion efficiency 90 percent or higher.	Staff agrees with the comment and the adopted language reflected this change	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238368&DocumentContentId=71657
238369.001	NLCAA	Section 130.1(c)5: It is not clear to NLCAA on the purpose of this language change. NLCAA does not see how "An area enclosed by ceiling height partitions that has only one luminaire with no more than two lamps" makes any sense here. Also, why repeat that Restrooms are required to have an occupancy sensor when it is already one of the areas listed at the beginning of 130.1(c)5. NLCAA would recommends the language be used instead: [suggested language PDF page 1 and 2.]	The purpose of the revision changes is to simplify the requirements and with links of the lighting applications to the types of applicable occupant sensing controls. Staff appreciates the comment and suggestion. In response to stakeholder's comment, staff reverted Section 130.1(c)5 to 2019 requirements as Staff deem the language to be the most appropriate. Additionally, there was one clarification change (keeping the 45-day text) for classrooms with a connected lighting load of 0.6 watts per square feet or less. Also there were revisions to all occasions where "sensors" were revised as "sensing controls".		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?n=238369
238370.001	Jim Stewart, PHD	Require all indoor LED light sources to comply with JA8 by being tested, their performance recorded in the JA8 database and being labelled JA8 works. Requiring that some sources have to comply with JA8 but not others, creates ambiguity and makes the standard less enforceable.	Staff appreciates the comment. The requirements of Table 150.0-A for indoor LED light sources - except inseparable solid state lighting (SSL) luminaires containing colored light sources for decorative lighting- were reverted to the 2019 Code language that they have have to meet JA8 requirements. (In existing Code, inseparable solid state lighting (SSL) luminaires containing colored light sources for decorative lighting are exempted from JA8 requirements.)	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?n=238370

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238370.002	Jim Stewart, PHD	In addition, remove all the changes to table 150.0-A and the new table 160.5-A so they match the 2019 requirements.	Removed all changes to to table 150.0-A and the new table 160.5-A - removed changes to inseparable solid state lighting luminaires (item #2 of the table) and tunable light sources. Item #2 of both Table 150.0-A and Table 160.5-A match the 2019 requirements.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238370
238370.003	Jim Stewart, PHD	Do not exempt Title 20 regulated general service LED lamps from the requirements for JA8.	Removed all changes to to table 150.0-A and the new table 160.5-A - there is no proposed exemption for Title 20 regulated general service LED lamps.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238370
238370.004	Jim Stewart, PHD	Align the flicker requirements in Title 24, part 6 and mandatory portion of Part 11 (CalGreen) with the IEEE-1789 standard Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers.	There is no proposal for the scoping of the 2022 Code Update to expanded or to add additional flicker requirements to Title 24, Part 6 in relation to the suggested IEEE1789 standard. Also about the comment about Part 11 (CalGreen), this docket and rulemaking does not include/cover Part 11 (CalGreen) and therefore Staff cannot comment or respond to the comment about Part 11 (CalGreen). Please see docket 21-BSTD-03.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238370
238371.001	California Municipal Utilities Association	CMUA is concerned that the changes proposed to the CSS set forth in the 45-Day Express Terms will reduce the likelihood that builders, electric utilities, or other groups will provide this important compliance option. The impact of such a result will be disproportionately imposed on lower income home buyers. For the reasons addressed below, CMUA urges the Commission to revise the proposed changes to the CSS to avoid this inequitable outcome.	Thank for you the comment. The CEC is committed to advancing an equitable energy code. Please see responses below for item 2-6. TN238371. The adopted language addressed most of these concerns	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238371&DocumentContentId=71648
238371.002	California Municipal Utilities Association	A. Dedicated Community Energy Savings Benefits CMUA supports the requirement that a CSS program benefit must exceed the cost of participation. CMUA encourages the Energy Commission to recognize that such calculations, both for rooftop PV and for CSS, must reflect the actual cost of providing services. Customers who do not participate in such programs should not be forced to subsidize the benefits to participating customers, whether they have rooftop PV or participate in a CSS program. CMUA further encourages the Energy Commission to consider the cost of the CSS program compared to the rooftop PV option when evaluating a CSS program application.	Staff appreciates the comment. The Commission previously assessed the cost-effectiveness of the low-rise residential rooftop PV requirement during the 2019 code cycle, and concluded based on conservative calculations that the rooftop requirement was especially cost-effective to consumers. One exception to this requirement is for a consumer to participate in an approved community solar program. Such a program is required to be evaluated by the Commission pursuant to 10-115 and found to be cost-effective to the consumer. Specifically, the reduction in the building's energy bill must be greater than the added cost to the building resulting from the building's share in the community shared solar and/or battery storage system. In order to ensure customers always have the ability to choose to comply with the standard via installation of rooftop PV, an "opt-out" provision was provided.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238371&DocumentContentId=71648
238371.003	California Municipal Utilities Association	B. Home Opt-Out Nothing in a CSS program should prevent those homeowners from installing rooftop PV, in addition to their CSS program, at any time in the future. However, an unlimited opt-out at any time creates significant challenges for CSS program developers and make it less likely that such programs will be developed.	Allowance for participant opt-out is standard expectation for community solar programs offered voluntarily to customers; having opt-out in combination with installation of rooftop solar meeting the building's PV obligation will lead to far less opt-out than the voluntary CS programs around the U.S.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238371&DocumentContentId=71648

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238371.004	California Municipal Utilities Association	<p>1. An unlimited Opt-Out increases risk and uncertainty for CSS program developers. CSS program administrators invest substantial resources in the design and construction of solar systems for home owners in their community. Permitting a homeowner to opt-out at any time increases the risk that a CSS project will have been overbuilt for that community. In such a circumstance the program administrator would need to offload any excess generation. While medium and large utilities may have flexibility in how they manage excess generation, smaller utilities and non-utility program developers would face greater challenges as a result of the increased uncertainty created by this proposed language. This increased uncertainty will raise project risk and make it more difficult for a potential program developer to acquire the needed project financing. This project finance challenge will be greatest for the smaller utility and non utility program developers.</p> <p>While administering a CSS project will become more complicated if a home owner actually opts out, the mere potential for home owner to opt out at any time will increase project uncertainty, raise finance costs, and drive some potential CSS project developers away from this important compliance option. In other words, under the proposal, even if no homeowners actually opt-out, the change in policy will still have imposed financial harm on project developers, and by extension, California home buyers. Further, some projects will not have</p>	Staff appreciates the comment. The Commission has determined based on extensive feedback from the public and consistently high levels of public interest, that an optout provision is in the public interest and will serve the ends of the regulation. Similarly, using the community solar exception is optional. Participating as an Administrator is optional.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238371&DocumentContentId=71648
238371.005	California Municipal Utilities Association	<p>2. A CSS program compliance option can help low-income and disadvantaged home buyers.</p> <p>The distribution of residential rooftop PV installation is clearly biased toward higher income and wealthier households. The subsidy from non-rooftop PV electricity customers to customers with rooftop PV, combined with the higher average income for households with rooftop PV yields a clearly inequitable transfer from lower income households to support the rooftop solar PV purchased by higher income households. The CSS program can provide a more economic option for builders to support solar for more affordable housing. But an opt-out at any time policy adversely impacts the vitality of the CSS program option, further reducing the likelihood that potential builders would see the option as an economic solution for affordable new residential building. A CSS project can offer all California home buyers including lower income home buyers, a lower cost option to directly support solar energy for their homes. CMUA encourages the Energy Commission to carefully consider the potential negative impact this policy change would have on the ability of lower income Californians to buy a new home.</p>	The Commission concluded that ensuring customers are able to opt-out is an important policy consideration including based on extensive public comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238371&DocumentContentId=71648

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238371.006	California Municipal Utilities Association	<p>C. CSS project operators are not responsible for the code compliance of opt outs.</p> <p>CMUA agrees with the December 23, 2020, comments offered by Sacramento Municipal Utility District (SMUD) regarding compliance verification. Operators of CSS projects are obligated to submit required information to ensure compliance with California building code. The nature of the CSS program ensures project compliance with the code over the full 20 year term. However, in the event that a new home buyer or future home owner opts out of the CSS, the Energy Commission must develop a means to assure code compliance. The CSS project operator has no legal ability, authority, or responsibility to assure a private homeowner's compliance with California building code once the home buyer opts out of the program. Code Compliance is the responsibility of local regulatory authorities, not a CSS project operator.</p>	<p>The obligation to install a rooftop PV system that meets or exceeds the size required by the Standards in effect at the time that home was built, prior to discontinuing participation in a CS program, is implemented by contractual obligations that the Administrator must ensure. Revise regulations to obligate CC&Rs that provide notice to all building owners of the obligation for building to participate for 20 years or install the required PV system to opt-out- allow an alternative for CEC to consider approving another approach to ensure compliance with the durability/opt-out requirements.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=238371&DocumentContentId=71648
238372.001	QC Manufacturing Inc., And	<p>Prior to 2019 code HERS verifications, the following airflow derating s are being applied to the WHF models prior to the cfm/watts being sent to the physics engine:</p> <ul style="list-style-type: none"> Airflow Degraded by +60% based on the assumption that only 1/3 of homeowners will open windows for cooling purposes. <p>In addition to the above software degradations applied to WHF airflow, the addition of 2019 code HERS resulted in a 3rd degradation of airflow:</p> <ul style="list-style-type: none"> Airflow degraded by 67% if no HERS verification is applied to the performance model. <p>Using the above computations, a model for a 2000 sq ft home, with a proposed WHF of 3000cfm, will be derated as follows:</p> <p>1 st derating: $3000 * .60 = 990$ CFM</p> <p>2 nd Derating $990 * .33 = 327$ CFM</p> <p>The resulting airflow CFM of 327 cfm is 5-ton sent to the physics engine for computations to evaluate the cooling AC offsets of the whole house fan. This mathematically implies to the physics engine that if no HERS test is performed, the home will be receiving only 1/10th of the airflow rate and cooling power of the whole house fan, and this is mathematically not correct,</p>	<p>This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=238372&DocumentContentId=71676

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238372.002	QC Manufacturing Inc., And	<p>When we inquired in 2019 about the first derating, the CEC stated they used the 2006 LBNL report Ventilation Behavior and Household Characteristics in New California Houses, from which they determined that only 1/3 of occupants would open their windows for cooling purposes. We inquired with LBNL as to whether their report in fact claims this, and they stated it does not. They directed me to these tables:</p> <p>Using the sum of the two left columns, the statewide probability that a homeowner will open up their windows for cooling purposes is 59 + 23 = 82% are likely to open their windows for cooling purposes.</p> <p>Using the sum of the two left columns, the statewide probability that a homeowner will open up their windows for cooling purposes is 50+21 = 71% are likely to open their windows for cooling purposes.</p> <p>In light of this corrected information, the initial derating of homeowner usage should be changed from 67% to 33%, to properly reflect that 2/3 of homeowners are willing to open their windows for home cooling, not 1/3 as what is currently being used.</p>	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238372&DocumentContentId=71676
238372.003	QC Manufacturing Inc., And	<p>As for the second derating, the derate is already baked into the algorithm, and the software applying it in again at runtime. This is a crucial point. The original WHF/Cool Vent field-tests prior to 2013 code that formed the basis of the WHF credit took nominal air-fan speed, and tested real-install (after static pressure losses) performance to correlate the performance credit as per the nominal fan speed. Now in addition, removal of the HERS verification derates from nominal to something lower (to account for static pressure losses), while still applying the same algorithm that already has the static-pressure loss baked in. They didn't test in the field what happens when you have 3,000 cfm flowing through the home from a nominal 3,000 CFM fan that has no static pressure. They tested what happens when a nominal 3,000 CFM fan is installed but only pushes out 2,000 or so because the attic blocks flow.</p> <p>This change of WHF sizing from 2013/2016 to 2019 code now has drastic impacts on causing WHF to be oversized just for a very small amount of EDR compliance, because the software model which was built years ago, is expecting higher CFMs of fans with no live static pressures, so a field verified cfm value that is modelled simply produces little compliance gains.</p>	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238372&DocumentContentId=71676

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238372.004	QC Manufacturing Inc., And	<p>These two deratings of the WHF, is causing following conditions to be in effect for this measure which need to be addressed:</p> <ol style="list-style-type: none"> 1. Compliance gains for multiple stories are improperly computed In 2013 and 2016 code, 3 story > 2 story > 1 story compliance for WHF. In 2019 Code 1 story > 2 story > 3 story, the computations are erroneous and backwards in relation to cooling savings based on stories. Due to heat rising, and a WHF being mounted on the highest floor, it is well understood that whole house fans work better in homes with more stories, and serve a better overall task of creating a balanced air temp across the entire home. 2. WHF must now be oversized, and this violates the concepts of right-sized equipment practices of Manual J, D, S. 2013/2016 sizing was based on lab certified CFM of WHF to sq footage of home. 2019 sizing must now be based on field verified CFM (much lower) of WHF to ratio of home. This results in larger fans, or multiple fans being required just to get 0.5-2 EDR This has made the measure cost prohibitive to builders previously very satisfied with the measure costs. Additional fans are not proven to be more effective, and homeowner simply does not need that much CFM or venting. 	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238372&DocumentContentId=71676
238372.005	QC Manufacturing Inc., And	<p>Decarbonization Considerations:</p> <ul style="list-style-type: none"> • Per American Journal of Engineering (AJER) 2013 Study • The carbon component emitted by the use of a 2-ton A/C per day emission of carbon is 5344 g. • For 5 summer months, that totals 800kg for a single home, or 8,000,000kg for 10,000 homes • Installation of a WHF reduces AC usage by 50-90%. This is the only measure able to claim such vast amounts of cooling offsets. 	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238372&DocumentContentId=71676
238372.006	QC Manufacturing Inc., And	<p>Estimations of Decarbonization Results</p> <ul style="list-style-type: none"> • In 2020 QuietCool was installed in over 20,000 new homes in CA new construction alone • Reducing the carbon footprint of CA new homes by 8,000,000 kg assuming only 50% of A/C usage was reduced. • That is very conservative, considering CA homes have a 5-ton system on average, and homeowners experience more than 50% A/C usage reduction. • That is 8 million metric tons of decarbonization that can be attributed to whole house fans in new homes built to 2016 code. 	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238372&DocumentContentId=71676

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238372.007	QC Manufacturing Inc., And	<p>This measure is being removed from many projects in 2019 code due to the errors listed above, and the result will be increased loads on the grids during peak hours, and an increase in carbon footprint of new homes in CA across the state.</p> <p>If the Commissioner, the CEC, and the statewide sustainable design agencies truly wish to make significant efforts in the decarbonization of residential new homes, they must start by repairing the improper calculations on whole house fans in CBECC res software, which is allowing this highly beneficial, prescriptive measure to be removed with no consequences to the computations of compliance.</p>	<p>This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238372&DocumentContentId=71676
238375.001	Alex Baker (Illuminating Engineering Society)	<p>Outdoor motion sensor problems have been raised relative to outdoor lighting. The topic was introduced on prior occasions and code development cycles from members of the lighting community for the reasons put forth here. We believe that the CASE team has ignored considerable evidence and prior comments that cost-effective PIR motion sensors do not work in a manner that ensures the proper activation of lighting systems in parking lots.</p>	<p>There are comments with different takes about the added Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C. Since no comprehensive data set is available about the subject other than dated studies and reports, Staff recommends not to propose Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C and to delete them in the 15-day language for 2022. This subject may be advisable to be revisited in the 2025 Code Development. (Same subject as in line item # 63, 71, 118, 149 and 162)</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238375
238375.002	Alex Baker (Illuminating Engineering Society)	<p>For example, a parking lot luminaire at 20 feet is expected to illuminate a rectangular area of about 4 mounting heights by 4 mounting heights, or up to about 6,400 square feet all around (except when blocked by a tree or light pole). But the area of coverage for a common Legrand FSP-L3 sensor, a typically used PIR sensor designed to be used outdoors at 20 feet, is only about 1,600 square feet. The motion sensor cannot be made to cover a larger area without a change in technology from PIR to microwave, which results in a significant increase in first cost. Without better coverage, serious gaps and even outages of lighting will occur, risking accidents and posing a security threat to pedestrians.</p>	<p>There are comments with different takes about the added Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C. Since no comprehensive data set is available about the subject other than dated studies and reports, Staff recommends not to propose Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C and to delete them in the 15-day language for 2022. This subject may be advisable to be revisited in the 2025 Code Development.</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238375
238375.003	Alex Baker (Illuminating Engineering Society)	<p>Our position was first discussed for this code cycle in January 2020 at a joint meeting of California-based members of IES and the International Association of Lighting Designers (IALD) at the PG&E Pacific Energy Center. When the functionality of passive infrared (PIR) motion sensors up to 24 feet was discussed, the 30+ attendees unanimously concurred that this Title 24 requirement required lighting control systems that did not work properly, and many had to revert to conventional controls such as photocells or time clocks for safety and security reasons.</p>	<p>Staff appreciate the comments. Even though some issues about outdoor motion sensing might be indicated to some of the CEC earlier, there were no details (data and evidence) provided to CEC for evaluation. It would be like finding a needle in a haystack for finding the problematic installations mentioned anonymously and it is near impossible for CEC to evaluate the mentioned issue.</p> <p>There are comments with different takes about the added Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C. Since no comprehensive data set is available about the subject other than dated studies and reports, Staff recommends not to propose Exception 4 to Section 130 and Exception 4 to Section 160.5(c)2C and to delete them in the 15-day language for 2022. This subject may be advisable to be revisited in the 2025 Code Development.</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238375

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238376.001	National Energy Management Institute Committee (NEMIC)	Request for clarification of added language in section 10-103(a)4B of the Draft 2022 Energy Code Express Terms 10-103(a)4B The added language "excluding all Certificates of Acceptance recorded by an acceptance test technician certification provider (10-103.1 and 10-103.2)." requires clarification. The added language, as it stands, does not provide clear direction or intent.	This language has been added in the 15-day language sections 10-103 and 10-109 and JA7.4.8. It precludes the "double registration" of NRCA forms with both the ATTCP and the NDR (if one is approved by the CEC).	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238376&DocumentContentId=71680
238376.002	National Energy Management Institute Committee (NEMIC)	New Acceptance Mechanical Acceptance tests for Multifamily have conflicting certification requirements. Clarity is required to ensure the correct workforce standards match the required skillset and knowledgebase. Section 120.5 and adds four new acceptance tests exclusively for multifamily (Section 160.3(c)3A). Section 160.3(c)3B requires an MATT. However, the Express Terms 2022 Energy Code, Reference Appendices refers to a HERS rater for NA7.18.1 and NA7.18.2. Multifamily acceptance tests: NA7.18.1 - Dwelling Unit Ventilation Acceptance • NA7.18.1.1.2 states - Step 2: Obtain HERS Rater field verification as specified in Reference Nonresidential Appendix NA7.18.2 - Dwelling Unit Enclosure Leakage Acceptance • NA7.18.1.2.2 states - Obtain HERS Rater field verification as specified in Reference Nonresidential Appendix NA7.18.3 - Central Ventilation System Duct Leakage Acceptance NA7.18.4 - Rated Central Ventilation System Heat Recovery or Energy Recovery Acceptance In addition to the conflict with Section 160.3(c)3B, the HERS program is not appropriate to address the requirements, safety, and health concerns of Multifamily Buildings. Multifamily Buildings should follow the same requirements as commercial	Section NA1.9 allows for a different compliance path to using the HERS Rater. It allows an ATT to substitute their training, testing, and NRCA data recording for the HERS Rater. We encourage stakeholders to submit a proposal for the 2025 Energy Code update cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238376&DocumentContentId=71680
238376.003	National Energy Management Institute Committee (NEMIC)	The procedure listed under Section NA7.18.3, follows a HERS leakage testing method. The HERS method, as adapted from ASTM E1554-07 Test Method D1, is not appropriate for Multifamily Buildings. The HERS method should be limited to single family residences. NA7.18.3.2 should be amended to require testing in conformance with the California Mechanical Code (CMC) 603.10.1.	Staff has determined that for systems serving unitary dwelling units the HERS leakage testing method is appropriate, and staff received no evidence to the contrary. We encourage stakeholders to submit a proposal for the 2025 Energy Code update cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238376&DocumentContentId=71680

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238377.001	Statewide Utility Codes and Standards Enhancement Team	The Statewide CASE Team's Multifamily Restructuring proposal included new subsections in Title 24, Part 6 which applied the 2019 residential requirements to multifamily dwelling units and 2019 nonresidential requirements to multifamily common use areas. This application is consistent with the 2019 requirements for multifamily buildings four or more habitable stories and multifamily buildings three or fewer habitable stories in which 20 percent or more of the conditioned floor area is not dwelling unit space. For multifamily buildings three or fewer habitable stories, where less than 20 percent of the conditioned floor area is outside of the dwelling units, the common area may meet residential requirements under 2019 Title 24, Part 6. The Statewide CASE Team proposed application of the nonresidential requirements to all common use areas to reduce energy use, align and simplify requirements across all multifamily buildings, and offer compliance credit opportunity under the performance approach.	We agree with the comment, and language was added to adopted standards.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238377&DocumentContentId=71675
238377.002	Statewide Utility Codes and Standards Enhancement Team	The Statewide CASE Team does not propose changes to the Title 24, Part 6 definition of dwelling unit. This definition captures living, sleeping, eating, cooking, and sanitation spaces contained in a single unit. As understood by the multifamily building industry, a dwelling unit may include shared living, eating, cooking, and sanitation behind the door of a single unit with multiple sleeping rooms. The definition the Statewide CASE Team proposes for common use area comes from Title 24, Part 2 and includes all non dwelling unit spaces in a multifamily building that are shared solely by owners, residents, and their guests. The February Express Terms and May 45-Day Express Terms introduced new terms and definitions for common living area and common services area, each a subcategory within common use area. The new terms, as applied in the 45-Day Express Terms, allow indoor air quality, space conditioning, and lighting requirements to differ between common living areas and common services areas, rather than apply to all common use areas.	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the confusion noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238377&DocumentContentId=71675
238377.003	Statewide Utility Codes and Standards Enhancement Team	The Statewide CASE Team and Compliance Improvement Team agree that introduction of common living area and common services area terms will cause confusion and questioning of the established and well-understood definitions of dwelling unit and common use area. Common living areas exist within and outside of dwelling units in multifamily buildings. Under 2019 Title 24, Part 6, common living areas within the dwelling unit are subject to dwelling unit requirements and those outside of the dwelling unit are subject to common use area requirements. Allowing these to fall under the dwelling unit and common use area definitions eliminates the need to introduce a new (and unfamiliar) common services area term. The compliance manuals are an appropriate platform for further illustrating application of requirements to various types of dwelling units and common use areas.	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the confusion noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238377&DocumentContentId=71675

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238377.004	Statewide Utility Codes and Standards Enhancement Team	<p>What is described in the 45-Day Language as 'common living areas' outside of the dwelling unit do not share usage patterns or metering structures with dwelling units and are therefore better grouped with other common use areas. The Statewide CASE Team's recommends removing the term 'common living area', and exclusion of these spaces from dwelling unit requirements in the following sections:</p> <ul style="list-style-type: none"> Section 160.3(a)1. Space conditioning control requirements for dwelling units are not appropriate for common living areas outside of the dwelling unit. Common use areas are typically served by separate conditioning systems than dwelling units and occupied differently than dwelling units. These shared spaces are typically metered separately from the dwelling units and individual residents are not accountable for energy use in these spaces. The control requirements of Section 160.3(a)2 allow for proper energy management in shared spaces and should apply to common living areas outside of the dwelling unit. 	<p>Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the confusion noted by the commenter.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238377&DocumentContentId=71678
238377.005	Statewide Utility Codes and Standards Enhancement Team	<ul style="list-style-type: none"> Section 160.5(a). Dwelling unit lighting control requirements for common living areas outside of the dwelling unit are more appropriately grouped with the other common use area spaces, covered under 160.5(b). 2019 Title 24, Part 6 requirements for multifamily buildings three and fewer habitable stories under Section 150.1(k)6 include requirements for lighting controls in interior common areas that are not included in the 45-Day Language for Section 160.5(a). Section 160.5(b) includes appropriate occupancy controls for all common use areas. 	<p>Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the confusion noted by the commenter.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238377&DocumentContentId=71678
238377.006	Statewide Utility Codes and Standards Enhancement Team	<ul style="list-style-type: none"> Section 160.6(b), as written in the 45-Day Language, allows exception to requirements for separation of electrical circuits for electrical energy monitoring for common living areas. Common living areas outside of the dwelling unit are unlikely to be metered differently or separately from common service areas. Common living areas do not need exceptions associated with dwelling units and including them in the exception may cause undue confusion for installation contractors and inspectors. 	<p>Staff finds that forcing application of nonresidential design principles to spaces designed and intended to act as or stand in for dwelling spaces would risk materially depriving residents of the benefits of having spaces designed according to residential lighting design principles. Staff therefore finds that a limited exception for these spaces that allows the option of compliance with residential rather than nonresidential requirements to be appropriate.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238377&DocumentContentId=71678
238377.007	Statewide Utility Codes and Standards Enhancement Team	<ul style="list-style-type: none"> Section 180.2(b)4A applies dwelling unit lighting requirements to common living areas. Consistent with the Statewide CASE Team proposal for new construction, we recommend that requirements for all lighting outside of the dwelling unit (all common use areas) align under Section 180.2(b)4B. 	<p>Staff finds that forcing application of nonresidential design principles to spaces designed and intended to act as or stand in for dwelling spaces would risk materially depriving residents of the benefits of having spaces designed according to residential lighting design principles. Staff therefore finds that a limited exception for these spaces that allows the option of compliance with residential rather than nonresidential requirements to be appropriate.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238377&DocumentContentId=71678

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238377.008	Statewide Utility Codes and Standards Enhancement Team	Under 2019 Title 24, Part 6 all common use areas are generally, and appropriately, subject to nonresidential requirements. This includes spaces that serve as community living areas outside of the individual dwelling units. The Statewide CASE Team's recommends replacing the term 'common services area' with 'common use area' in the following sections: <ul style="list-style-type: none"> Section 160.2(c), as written in the 45-Day Express Terms, applies to common services areas and Section 160.2(b) applies to dwelling units. Common living areas outside of the dwelling unit do not fall under either definition are by default exempt from indoor air quality requirements. ASHRAE 62.2, from which requirements for residential indoor air quality originate, applies specifically to enclosed dwelling units and does not extend to common living areas outside of the dwelling unit. All common use areas should therefore comply with the requirements of Section 160.2(c), which captures application to all common use spaces in Table 160.2-B through Table 160.2-F. 	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the confusion noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238377&DocumentContentId=71678
238377.009	Statewide Utility Codes and Standards Enhancement Team	<ul style="list-style-type: none"> Section 160.3(a)2, as written in the 45-Day Express Terms, applies space conditioning control requirements only to common services areas. This section should apply to all common use areas, including common living areas outside of the dwelling unit, for appropriate energy management in shared spaces. 	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the confusion noted by the commenter. Staff did add a limited exception for shared dwelling areas to be controlled by dwelling controls, to account for cases such as adjacent dormitory rooms sharing a bathroom.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238377&DocumentContentId=71678
238377.01	Statewide Utility Codes and Standards Enhancement Team	<ul style="list-style-type: none"> Section 160.3(c), as written in the 45-Day Express Terms, applies mandatory space conditioning requirements to common services areas and Section 160.3(b) applies to dwelling units. This leaves common living areas outside of the dwelling unit exempt from mandatory space conditioning requirements. 	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the unintended gap in application noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238377&DocumentContentId=71678
238377.011	Statewide Utility Codes and Standards Enhancement Team	<ul style="list-style-type: none"> Section 160.5(b) does not include common living areas outside of dwelling units, as written in the 45-Day Express Terms. The result is removal of occupancy control requirements for interior common areas of multifamily buildings, under 2019 Title 24, Part 6 Section 150.1(k)6. 	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the unintended gap in application noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238377&DocumentContentId=71678
238377.012	Statewide Utility Codes and Standards Enhancement Team	<ul style="list-style-type: none"> Section 160.6(d) includes requirements for circuit controls for 120-volt receptacles and controlled receptacles for common services areas. Common living areas outside of the dwelling unit should not be exempt from this requirement. 	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the unintended gap in application noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238377&DocumentContentId=71678

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238377.013	Statewide Utility Codes and Standards Enhancement Team	<p>• Section 170.2(e), which originates from the nonresidential prescriptive lighting requirements, applies only to common services areas in the 45-Day Express Terms. The Statewide CASE Team understands that common living areas outside of the dwelling unit were previously subject to low-rise residential requirements if less than 20 percent of the conditioned floor area. Per stakeholder conversations, these spaces easily meet the power allowances outlined in Section 170.2(e) without additional cost. Allowances for each common use area, including common living areas outside of the dwelling unit, are already included in Tables in Section 170.2. Grouping the common living areas with the other common use areas establishes a platform for improving prescriptive requirements and offering compliance options for these spaces in future code cycles. Otherwise, these spaces are subject to mandatory requirements only.</p>	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the unintended gap in application noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=238377&DocumentContentId=71678
238377.014	Statewide Utility Codes and Standards Enhancement Team	Section 180.2(b)4B applies lighting requirements only to common services areas and excludes common living areas. The Statewide CASE Team recommends alignment of all common use areas under this section, consistent with our proposed changes for new construction.	Staff reverted to language using the existing Part 2 definition of "common use area", removing these alternate phrases and removing the unintended gap in application noted by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=238377&DocumentContentId=71678
238378.001	Joint Committee on Energy and Environmental Policy	<p>OPPOSITION TO REMOVAL OF HIGH-RISE RESIDENTIAL BUILDINGS FROM STANDARDS APPLICABLE TO HOTEL/MOTEL BUILDINGS AND NONRESIDENTIAL BUILDINGS</p> <p>First, this change occurs in so many places in the code that it creates confusion and requires more time than the comment periods provided for stakeholders to assess whether this would result in any substantive changes in energy code requirements applicable to high-rise residential buildings. Despite our requests, Commission staff have not clearly identified to the public whether current requirements for high-rise residential buildings will change at all as a result of the format change. Prior to approval, a matrix identifying these changes must be provided. Without such disclosure, it is unclear whether the proposed format change will, in fact be a substantive change that results in increased energy use in high rise residential buildings or would impact protection of indoor air quality in such buildings. The current COVID-19 pandemic underscores the need to maintain strong standards for high-occupancy, high-rise residential buildings. JCEEP respectfully requests that these changes be put off until the next code cycle, due to a failure of staff to provide a clear analysis of all changes in current requirements for high-rise residential buildings that this format change will create and an opportunity for stakeholder comments on these changes.</p>	Staff appreciates the comment. Staff finds that the record provides clear analysis to support all changes to requirements for high-rise residential buildings. Based on the information available in the record, Staff concluded that delaying the requested reorganization of multifamily provisions into dedicated chapters is not appropriate, as the adopted changes do not affect indoor air quality in the manner of concern to the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=238378&DocumentContentId=71678

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238378.002	Joint Committee on Energy and Environmental Policy	Second, the proposed format change is unnecessary and will create confusion. Currently, high-rise residential buildings, hotel/motel buildings and nonresidential buildings are subject to many of the same standards due to the fact that the HVAC, lighting control and other building systems they utilize tend to be more complex and closer in type and size than the systems used in low-rise residential buildings. The Express Terms attempt to address the fact that high-rise residential buildings are different by including numerous new provisions in the multifamily residential building sections that add additional requirements for high-rise residential buildings. Builders in California are used to the current Energy Code format in which requirements for high-rise residential buildings are set forth separately from requirements for low-rise residential buildings. Changing the formatting now will simply cause short-term confusion with little tangible benefit.	The adopted reorganization was based on conversations with stakeholders, including builders of multifamily buildings and code enforcement officials. Staff concluded that the change will assist efforts to understand and apply code requirements to multifamily buildings, as well as provide a better context for identifying and resolving points of confusion relating to these buildings.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678
238378.003	Joint Committee on Energy and Environmental Policy	Third, the proposed change makes it likely that energy standards for high rise residential buildings will progress more slowly than if these standards remained connected to standards for hotel/motel buildings and nonresidential buildings. Affordable housing concerns limit the ability of the Commission to increase energy standards for low-rise residential buildings as quickly as hotel/motel buildings and nonresidential buildings. High-rise residential buildings, however, are different from low-rise residential buildings. Because of their height and high occupancy, they are already required to comply with numerous high-rise specific provisions involving structural integrity, fire-life safety and other requirements. Because of their size, these buildings also use substantial amounts of energy and thus represent more efficient targets for energy reduction measures.	Staff finds that an ability to more easily identify and address affordable housing impacts is consistent with state policy. Staff concluded that relying on the prior organization to obscure possible housing affordability impacts by presenting them as nonresidential impacts is not consistent with state policy. Therefore, no changes were made in response to this comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678
238378.004	Joint Committee on Energy and Environmental Policy	<p>OPPOSITION TO REMOVAL OF BALANCING REQUIREMENTS FOR MULTIFAMILY BUILDING CENTRAL VENTILATION SYSTEMS</p> <p>Rather than fixing this issue, the current Express Terms now propose to even further reduce the efficiency of HVAC systems by now eliminating both balancing and adjusting requirements. The current express terms now entirely remove all previous changes and existing balancing requirements and replace them with a "Reserved," essentially removing all balancing and adjusting requirements. This removal of requirements to balance ventilation systems will lead to an increase in wasted energy. We urge staff to return to the existing balancing standard in the 2019 Energy Code.</p>	All multifamily requirements were moved to the new multifamily chapters as part of the multifamily restructuring effort. The balancing requirements for multifamily have not been eliminated. See Section 160.2 for new location.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678

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238378.005	Joint Committee on Energy and Environmental Policy	<p>REFERENCES TO UV-RATED DRAWBANDS AND UV-RESISTANT NYLON DUCT TIES SHOULD BE DELETED TO ENSURE CONSISTENCY WITH THE 2021 UNIFORM MECHANICAL CODE</p> <p>The reason for this withdrawal was the Iain Walker/Max Sherman study from Lawrence Berkeley National Labs (LBNL) that found nylon connectors regularly failed well before their stated life expectancy after being exposed to high heat. Discoloration of the nylon strapping was observed within one month of the start of testing and straps began breaking after four months. Strap failure is a major problem, because mechanical attachment thereafter is maintained only by the duct sealant. If ducts are not well supported, significant mechanical stress can occur to cause the sealant to fail after the strap fails. In extreme cases, the duct connection may separate. Straps made of these materials may have improved high temperature durability. As an alternative, the authors recommend metal straps because they have no temperature degradation. The UV rating of these straps did not provide any protection from this heat-related degradation.</p> <p>Section 120.4(b)(2)(E)(i). Section 150.0(m)(3)(E). Section 160.3(b)(5)(C)(v). Section 160.3 (c)(2)(C)(ii)(e)(I). NA7.5.3 Air Distribution Systems.</p>	<p>Staff appreciates the comment. Current code requires that drawbands used on flexible ducts have a minimum tensile strength of at least 150 lbs and be tightened as recommended by the manufacturer. Prohibiting UV-rated drawband and duct ties would be a major revision that would warrant stakeholder feedback early in the Standards development process.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678</p>
238378.006	Joint Committee on Energy and Environmental Policy	<p>DUCT LEAK TESTING PROCEDURES SHOULD BE AMENDED FOR CLARITY AND TO AVOID IMPROPER EXEMPTION</p> <p>The current Express Terms language for NA7.5.3.2 only require conformance to the leakage standards in sections 120.4(g) and 141.0(b)2Dii, which will allow for significant leakage. Section 141.0(b)2Dii also allows for visual inspection for leak sealing verification, which is insufficient to ensure leaks will be sealed and energy savings will be realized. We are concerned that these sections contain ambiguities which allow for some systems to become improperly exempted from testing requirements. In particular, the exemption 1 provision stating that the space conditioning system serve less than 5,000 square feet could effectively exempt a 100,000 square foot building with 20 separate systems. A building of that size should not be exempted from the more robust dust testing requirements. We recommend clarifying that exemption 1 does not apply to any buildings greater than 5,000 square feet.</p>	<p>Staff notes that this is an existing requirement that has been moved from Section 140.4 to Section 120.4. This requirement is only applicable to (1)constant volume single-zone space conditioning systems (2)serving less than 5,000 sf of floor area and (3)having more than 25% of the ducts located in unconditioned spaces. The example 100,000 sf building is very unlikely to meet this criteria. If it exist that a building has multiple systems that does meet the criteria, testing these multiple systems is no different than testing a single system serving a building less than 5,000 sf.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678</p>

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238378.007	Joint Committee on Energy and Environmental Policy	ACCEPTANCE TESTING FOR MULTIFAMILY BUILDINGS SHOULD NOT REQUIRE HERS RATER FIELD VERIFICATION OR FOLLOW HERS PROCEDURE The Express Terms language for NA7.18.1.1 and NA7.18.1.2 both require multifamily dwellings ventilation and enclosure leakage acceptance to be verified by a HERS rater. However, the Express Terms also require acceptance testing to be completed by a Certified Mechanical Acceptance Test Technician, making HERS rater-verification redundant and burdensome. The HERS program is designed for single-family residences making HERS raters inappropriate for multifamily projects. To avoid confusion and reduce unnecessary burden and energy waste, NA7.18.1.1.2 and NA7.18.1.2.2 should be removed. Further, Section 120.5 of the Express Terms requires four new acceptance tests exclusively for multifamily dwellings, but the Express Terms Reference Appendices require the HERS method. NA7.18.3.2 should be amended to require testing in conformance with the CMC.	Staff notes that this is an existing requirement and that multifamily buildings have been part of the HERS program for previous code cycles - in relocating provisions applicable to multifamily buildings to a new location within the Energy Code, staff has preserved existing requirements where feasible and not superseded by proposed updates to residential and nonresidential energy efficiency standards. The prior distinction between "low rise" and "high rise" residential buildings did result in HERS requirements applicable for some dwelling units, and staff has not received any information about either the benefits or costs of preventing HERS raters from performing this work. Given the likelihood of adverse economic impact to HERS professionals and the absence of analysis in the rulemaking record, staff did not find it appropriate to make this change at this time. For context, the tests mentioned are dwelling unit ventilation and enclosure tests, not specific to central systems or whole building. NA7.18.1 and NA7.18.2 specifies verification is obtained according to NA1. Compliance with HERS verification may alternatively be done by a ATT according to NA1.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678
238378.008	Joint Committee on Energy and Environmental Policy	PROPOSED CHANGES TO ATTCP ELECTRONIC DATABASE SYSTEM REQUIREMENTS We appreciate the changes staff made to this section from the original pre rulemaking proposals. We support the current proposals.	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678
238378.009	Joint Committee on Energy and Environmental Policy	PROPOSED CHANGES FOR DEMAND RESPONSE The Energy Commission is proposing to change the minimum requirements for mandating demand responsive lighting controls from a square footage requirement to a wattage requirement. We are concerned that this will allow for more buildings to escape this requirement. For example, assuming a light power density of 0.5 watts per square foot and a fixture wattage of 32,000 square feet, a building would have to be 13,000 square feet to trigger a requirement of demand responsive lighting controls. This proposal thus moves in the wrong direction and will lead to an increase of energy, rather than an increase in efficiency. The Energy Commission should instead continue with a 5,000 square foot requirement to increase adoption of demand responsive lighting controls.	The shift to a wattage requirement was made to more closely match the equipment being controlled to the requirement. This was done to ensure that large spaces with minimal lighting were not required to install demand response controls, due to the controls not being cost effective.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678
238379.001	BayREN Codes & Standards Program	Support for new multi-family chapter and restructuring. BayREN Codes and Standards would like to thank CEC staff for restructuring the multifamily energy standards. These changes make the energy standards easier to understand and enforce, thereby improving compliance and energy savings.	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238378&DocumentContentId=71678

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238379.002	BayREN Codes & Standards Program	Recommendation to continue providing an Index To further make the Energy Code easier to understand and enforce, the final version of the 2022 Energy Code Update should include an Index, similar to other Parts of Title 24. The 2019 Energy Code Update was the first time that an index was provided. Since local government staff work with all of the Parts, anything that makes Part 6 more like the other Parts and easier to navigate, such as an Index, will help local staff with enforcement of the Energy Code.	Staff notes that inclusion of the Index in the Express Terms was inadvertent: the index present in the CEC-published version of the 2019 Energy Code is not regulatory and is not formally part of the California Code of Regulations. As such, it should have been absent from the Express Terms and not shown as struck through. Addition of a Table of Contents and Index can (and is expected to) occur as a part of later publications of reference versions of the Energy Code by the CEC.	6/21/2021	45-Day	http://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238379&DocumentContentId=71675
238379.003	BayREN Codes & Standards Program	Support for heat pump baselines, heat pump requirements, and electric-ready requirements. Over a third of local jurisdictions in the San Francisco Bay Area have adopted reach codes that either require or encourage efficient all-electric construction, and more jurisdictions within our territory are considering similar reach codes. In addition, local governments are starting to consider reach codes for existing buildings more than ever before. The inclusion of heat pump baselines, requirements for heat pumps either for water heating or space heating, and electric ready requirements in the 2022 Energy Code Update build on and support these local efforts.	Staff appreciates the comment supporting the proposed amendments.	6/21/2021	45-Day	http://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238379&DocumentContentId=71675
238379.004	BayREN Codes & Standards Program	Recommendation for expanded compliance incentives, enhanced compliance software, and 2022 Compliance Manuals to address heat pump systems for large buildings While heat pump technologies for smaller buildings have been incorporated into the Energy Code, heat pump systems for larger buildings are lagging. These systems are an important piece of the puzzle for local governments looking at ways to reduce both energy use and greenhouse gas emissions from buildings. The Energy Code and the software that supports it therefore need to include compliance incentives and the ability to model these types of systems. In addition, the 2022 Compliance Manuals should include appropriate detail and guidance to help building professionals and building departments navigate compliance issues for these systems.	Staff notes that the comment relates to compliance software, and not to proposed amendments to regulatory language. Evaluation of supporting software will continue as an ongoing effort.	6/21/2021	45-Day	http://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238379&DocumentContentId=71675

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238380.001	San Francisco Public Utilities Commission	<p>Unlike many publicly owned utilities (“POUs”), Hetch Hetchy Power does not own almost all the distribution system in San Francisco. Hetch Hetchy Power provides power through Pacific Gas and Electric Company’s (“PG&E”) distribution grid. This unique circumstance affects the export assumptions and resulting benefits used by the Energy Commission to assess cost-effectiveness and affects other assumptions used to calculate cost-effectiveness. In addition, the requirement that all community solar projects be on the same distribution system as the load serving entity that serves the building benefitting from the community solar project will unnecessarily burden projects developed to serve Hetch Hetchy Power’s customers.</p> <p>For the abovementioned reasons, the SFPUC respectfully asks the Energy Commission to 1) modify the new location requirement for community solar and/or battery projects and 2) delay the adoption of the PV and Battery measure until the Energy Commission’s updates its analysis and allows additional review by stakeholders of the updates.</p>	<p>The Hetch Hetchy Power (City of San Francisco) situation is unique and complicated. Nonetheless, the 10-109(k) process is designed precisely to handle such situations. Staff believes that section 10-109(k), as updated in the 2022 code cycle, can be used to address Hetch Hetchy Power’s concerns. The CEC would welcome a draft application as soon as Hetch Hetchy is ready to submit it.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?en=238380&DocumentContentId=71674
238380.002	San Francisco Public Utilities Commission	<p>1. The Energy Commission should assess the customer costs of the PV and battery storage measure under conditions where the load serving entity providing service to the customer does not own the distribution grid being utilized.</p> <p>Hetch Hetchy Power operates on PG&E’s grid and must purchase access to interconnect to PG&E’s grid. Furthermore, there are existing rules for interconnection of exporting facilities defined by PG&E. 3 Hetch Hetchy Power can only apply to interconnect its customers pursuant to the terms of PG&E’s wholesale distribution tariff for exports⁴ and obtain excess generation compensation for a limited subset of its customers under PG&E’s NEMCCSF tariff. 5 This relationship with PG&E makes developing net energy metering (NEM) or virtual net energy metering (VNEM) tariffs for Hetch Hetchy Power’s customer costly and, in some cases, impractical. Ultimately, PG&E has discretion over when and where our customers can export back onto PG&E’s grid, limiting the amount of solar Hetch Hetchy Power can permit our customers to install. Because of the unique circumstances of Hetch Hetchy Power’s operations, building developments that are served by Hetch Hetchy Power may not be able to realize the export benefits that the measure proposal assumes will be realized.</p> <p>For example, even when adding battery storage system requirements to reduce grid exports from the solar to 10% of the system’s annual solar generation, the measure proposal</p>	<p>See response to item 1 (TN238380)</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?en=238380&DocumentContentId=71674

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238380.003	San Francisco Public Utilities Commission	<p>2. The requirement that all community solar projects be on the same distribution system as the load serving entity that serves the building should be removed.</p> <p>The on-site PV and battery system measure can be met through the use of a community shared solar and/or battery storage system project.¹⁰ These community projects have provided an alternate compliance path for single family buildings and are being proposed as an alternate compliance path for multifamily and nonresidential buildings. The SFPUC is supportive of this alternate compliance mechanism and wants the option of providing community solar and/or battery projects to the multifamily high rise and nonresidential buildings it serves. However, the proposed modifications to Section 10-115 of the building energy efficiency standards code will drastically impact the costs of building community solar projects for Hetch Hetchy Power. Section 10-115(a)(6), the proposed addition to Section 10-115, requires community shared solar and/or battery projects that are used to comply with the on-site PV and battery measure to be located on the “distribution system of the load serving entity providing service to the participating buildings”.¹¹ This is concerning for three reasons: 1) Hetch Hetchy Power does not own most of its distribution system; 2) the locations where Hetch Hetchy Power does own distribution infrastructure are not the locations where participating buildings will be located; and 3) building community solar in a dense urban environment such as San Francisco will complicate the technical</p>	See response to item 1 (TN238380)	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238380&DocumentContentId=71674
238380.004	San Francisco Public Utilities Commission	<p>3. The Energy Commission should consider additional peak periods when evaluating the benefits of the battery storage portion of the proposed measure.</p> <p>Hetch Hetchy Power has a different peak period cost structure than that of the investor-owned utilities. However, cost-effectiveness for the battery storage system portion of the proposed measure was analyzed under a “Time-of-Use” control dispatch scheme which requires storage to only charge from the on-site PV during solar hours and only discharge from 4 pm to 9 pm.¹⁵ The purpose of including battery storage is to offset customer load during the 4 pm to 9 pm peak period. However, the peak period used for the analysis does not apply to Hetch Hetchy Power. The measure proposal overstates what the peak electrical demand reduction and associated savings provided by the battery storage would be for Hetch Hetchy Power customers because Hetch Hetchy Power is a 12 pm to 6 pm peaking utility. Thus, the measure proposal’s conclusion that “the primary benefit of the proposed battery requirement is [in] the ability to limit exports to the grid from PV generation, and [in] reducing peak demand and energy use during peak periods”¹⁶ does not extend to Hetch Hetchy Power in the same way. The late evening peak period benefit will not materialize for Hetch Hetchy Power customers that comply with the measure if it is adopted as-is. For this reason, the SFPUC recommends that the Energy Commission widen the scope of its cost and benefit analyses by considering other utilities’ peak periods and time-of-</p>	See response to item 1 (TN238380)	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238380&DocumentContentId=71674

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238381.001	Ronald J Martin	The 2022 building code should mandate that buildings be powered all electrically. No natural gas appliances should be permitted, since natural gas releases toxins and as a fossil fuel it makes the climate crisis worse. California should be a leader in ethical response to the climate emergency, turning away from activity that will sicken, starve, and kill millions of our great grandchildren. Permitting gas infrastructure that should be abandoned and stranded as our state makes the correct response to the climate crisis is not smart.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238381&DocumentContentId=71670
238382.001	John McHugh	Recommendation to reverse the changes to Sections 150.0(k)1B, 160.5(a)1B and Tables 150.0-A and 160.5-and support quality residential lighting	There is insufficient evidential data at this time to support the proposed JA8-exempted LED light source to be exempted from flicker reduction requirements, and staff conclude that the proposed JA8-exempted LED light sources and JA8 compliant LED light sources should meet the same JA8 qualifications requirements. As such, staff recommend to revert the language so that the proposed JA8-exempted LED light sources shall meet the same qualification requirements of JA8 LED light sources. This would revert the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238382
238382.002	John McHugh	The proposed 45-day express terms changes to Section 150.0(k)1B, Table 150.0-A and their counterparts in the new multifamily Section 160.5 would eliminate the JA8 requirements for most light sources in the JA8 database. Additionally, exempting some of the LED source categories would undermine the simplicity of residential lighting enforcement by creating ambiguity around which LED light source need labels and which one's do not. I recommend that CEC staff interview people who are involved with assuring compliance with the residential standards their thoughts on the proposal require labels and the quality specification on only a subset of LED lighting products.	The comment stated that the proposed changes to the light source types considered to be high luminous efficacy by default could undermine the enforcement of the residential lighting standards. Staff did not find the proposed changes would undermine the enforcement of the residential lighting standards in most scenarios as all JA8 compliant light products were required to have a JA8 marking. However, as there was insufficient evidential data at this time to support the proposed light sources to be considered as high luminous efficacy by default, staff concluded that the proposed light sources should not be considered as high efficacy. As such, staff reverted the language so that the proposed light sources should meet the JA8 qualification requirements. This would effectively revert the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238382
238382.003	John McHugh	As shown in Figure 1, the exceptions for inseparable solid state lighting sources and general service LED lamps would reduce the number of JA8 covered models to only 4.9% of models currently in the JA8 database. Some fraction of the remaining 4.9% LED sources (small diameter directional lighting, decorative lights, light engines and strip lights) would also be exempted for having color tuning or dim to warm controls.	There is no proposed changes to the JA8 labeling requirements. For light sources qualified as high luminous-efficacy by default as listed on Table 150.0-A, they are not required to have a JA8 label. The enforcement rule is not changing regardless the outcome of the proposed changes.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238382
238382.004	John McHugh	The ease of enforcing the current JA8 requirements result from their simplicity: every indoor LED that is capable of producing white light shall have the JA8 label. Under the proposed changes, this simple enforcement rule will be no longer valid; only 4.9% of the number of models in the current JA8 database would be required to have the JA8 mark.	There is no proposed changes to the JA8 labeling requirements. For light sources qualified as high luminous-efficacy by default as listed on Table 150.0-A, they are not required to have a JA8 label. The enforcement rule is not changing regardless the outcome of the proposed changes.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238382

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238382.005	John McHugh	<p>Around 8% of the lamp models in the JA8 database might be considered a Title 20 general service lamp. However, not all ornamental lamps and not all reflector lamps are considered general service. With only 3,300 general service lamps models out of the 62,000 light source models in the JA8 database, one might think that relaxing the general service lamp requirements would not have much impact. However, the number of lamps sold per model number are much greater than the number of integral fixtures sold per model. Thus, relaxing the lighting quality and flicker requirements on Title 20 lamps has a disproportionately large impact on the new homes and dwelling units built in California.</p>	<p>The comment describes Title 20 general service lamp products vs ornamental lamps and reflector lamps and that the proposed changes to cover Title 20 general service lamps as high luminous efficacy light sources by default could have a high impact to the forthcoming JA8 product mark up. The proposed changes is not about changing the market mark up as the end goal but rather it is about allowing cost effective and highly efficient lighting products to be installed in residential buildings. Staff do find that there is lacking evidential data at this time to support the proposed Title 20 general service lamps to be exempted from flicker reduction requirements, and staff conclude that the proposed Title 20 general service lamps should meet the JA8 qualifications requirements.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238382
238382.006	John McHugh	<p>It is confusing for the lay person or even a building official to know what is a Title 20 general service lamp: "A" lamps are general service, but some reflector lamps are too; PAR 20's are included but not short neck PAR 20's, some globe lights are included but not ones less than 1.5" or greater than 5" diameter. Training and enforcement on differentiating which lamps must have the "JA8" marker versus those that are exempted is not straightforward.</p> <p>All lamps sold in California are supposed to comply with Title 20, but there is no "Title 20" mark on the lamp. If the 45-day Express Terms are adopted, residential lighting code enforcement will no longer be as easy. With there be a requirement for HERS raters to compare lamp models against the Title 20 database? What is the mechanism for enforcement under the proposed change? The features of a JA8 lamp and Title 20 general service lamp are compared in the table below.</p>	<p>The comment states that it could be confusing for building officials and a lay person to determine a Title 20 general service lamp as there is no Title 20 marking on a Title 20 general service lamp. This may occur in some unlikely scenario of someone who may obtain a non-compliant with Title-20 lamp product and the person claims it to be a Title 20 compliant lamp during an inspection process. California laws require all general service lamp products sold in California to meet the Title 20 Appliance Efficiency Regulations for general service lamps.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tno=238382

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238382.007	John McHugh	<p>Besides the difficulty of enforcing the Title 20 standard during site inspection, what is being proposed is less protective of California's citizens. As a standard that applies to all lamps sold, the Title 20 standard does not have the same level of stringency as standard that only applies to permitted residential construction. Most of the sockets in new construction have either dimmers or occupancy sensors. The Title 20 standard does not require that lamps be dimmable. Placing non-dimmable lamps in sockets controlled by a dimmer can impact the longevity of the lamp, and sometimes the house if the lamp catches fire.</p> <p>Though both JA8 and Title 20 requires testing in regards to whether lamps can last under elevated temperatures conditions in enclosed or recessed fixtures, only JA8 requires that the lamp be labelled "JA8-2022-E" to indicate that it is compatible with enclosed or recessed luminaires.</p> <p>Though static (non-dimmable) LED lamps can just as easily flicker as dimmable lamps, the Title 20 standard only requires that dimming lamps need be tested for flicker. Non-dimming lamps regulated under Title 20 are not required to be tested for flicker. This is perhaps due to a misconception that flicker is mainly a function of dimming. This is not the case, lamps without dimmers also flicker.</p>	<p>The comment states that what is proposed is less protective of California's citizens. All Title 20 standards products have to pass Title 20 required testing and the manufacturer has to certify their Title 20 compliant products including the product information to the Energy Commission. Further the Energy Commission audit the certified products from time to time. Staff do not find this comment to be sound.</p> <p>The comment further states the Title 20 Standards only requires dimming lamps to be tested for flicker. Staff agree that the JA8 flicker test is applicable to dimming lamps and non-dimming lamps.</p> <p>Staff do determine that there is lacking evidential data at this time to support the proposed Title 20 general service lamps to be considered as high efficacy and thereby be exempted from flicker reduction requirement, and staff conclude that the proposed Title 20 general service lamps should meet the JA8 qualifications requirements.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238382
238382.008	John McHugh	<p>There have also been recommendations to not only exempt Title 20 regulated general service LED lamps but all Title 20 regulated LED lamps. The other Title 20 regulated lamps have even less quality requirements, there is no minimum color rendition of flicker requirements for these lamps.</p> <p>As I mentioned in my comments to the EIR docket, I though the "reduced flicker operation" (< 30% amplitude modulation for frequencies less than 200 Hz) requirement in JA8 and T-20 (for dimming lamps) has eliminated some of the worst performing light sources in terms of flicker, but minimal compliance with this standard is still 300% higher than the recommended amplitude modulation (percent flicker) for the primary frequency of interest (120 Hz; see the green line on figure 2). Thus it is highly desirable that specifiers, consumers and regulators such as the Energy Commission, the California Department of Public Health and Cal OSHA have access to this information.</p> <p>During the development of the 2016 Title 24 standards including JA8, the Statewide CASE team had tested omnidirectional lamps for flicker and found that approximately one half would not pass the relatively weak "reduced flicker operation" requirement that is in JA8 and in Title 20, but only for dimming lamps. An additional study found that LEDs have a broad range of flicker performance from very low flicker (less than incandescent) to extremely high flicker (as high as 100% amplitude modulation)</p>	<p>The comment speculates that there are recommendations to exempt all Title 20 regulated lamps.</p> <p>This is inaccurate as the proposed code change for the 45 Day Express Terms for Title 20 is directed to Title 20 general service LED lamps, not all Title 20 regulated lamps.</p> <p>About the flicker reduction requirement, staff agree that the JA8 flicker test is applicable to LED lamps and light sources except those already exempted in the current code - those include LED light sources for outdoor and those inseparable solid state lighting (SSL) luminaires containing colored light sources.</p> <p>Regarding the code changes to the proposed light sources to be considered as high luminous efficacy by default, staff determine that there is lacking evidential data at this time to support the proposed Title 20 general service lamps to be considered as high efficacy and thereby be exempted from flicker reduction requirement, and staff conclude that the proposed Title 20 general service lamps should meet the JA8 qualifications requirements.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=238382

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238382.009	John McHugh	<p>I recommend that the Commission reverse course on dismantling the lighting quality specification as implemented through enforcement of JA8 for all indoor LEDs that are capable of producing white light. To do this I recommend reinstating the requirements of the 2019 version of Title 24, part 6 in table 150.0-A by making the following changes to the 45-day Express Terms in developing the 15-day Express Terms for 2022 Energy Code:</p> <ul style="list-style-type: none"> • Table 150.0-A Classification of High Luminous Efficacy Light Sources, revert the requirements back to as they were in the 2019 standards. Adding the term "luminous" before efficacy does not change the intent. • Table 160.5-A Classification of Dwelling High Luminous Efficacy Light Sources, match the requirements to Table 150.0-A after they have been reverted back to as they were in the 2019 standards. • Section 150.0(k)1B, remove list of lamps that are treated as an alternative to JA8 compliance in screw-based luminaires. Strike from requirements "or contain lamps as specified in Table 150.0-A including qualified colored lamps, dim-to-warm lamps, tunable-white lamps, color-tunable lamps, and Title 20-compliant LED lamps." • Section 160.5(a)1B. remove list of lamps that are treated as an alternative to JA8 compliance in screw-based luminaires. Strike from requirements "or contain lamps as specified in Table 150.0-A including qualified colored lamps, dim-to-warm lamps, tunable-white lamps, color-tunable lamps, and Title 20- 	<p>The comment characterize the proposed code change as dismantling the lighting quality specifications. This is inaccurate as there are no major changes to the JA8 requirements in the 45-day Express Terms and recessed downlight luminaires are still required to meet JA8. Though dim-to-warm and tunable LED light sources, color-tunable LED light sources and Title 20 general service LED lamps are proposed not required to meet JA8 in the 45-day Express Terms.</p> <p>Regarding the code changes to the proposed light sources to be considered as high luminous efficacy by default, staff determine that there is lacking evidential data at this time to support the proposed light sources to be considered as high luminous efficacy source by default and staff conclude that the proposed light sources should meet the JA8 qualifications requirements.</p> <p>As such, staff recommend to revert the language so that the proposed light sources shall meet the JA8 qualification requirements, and this would effectively revert the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.D936</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238382
238383.001	CAL SMACNA	<p>National SMACNA expedited the publication of their most recent Systems Air Leakage Test (SALT) standard in 2020 so that it could be used and referenced in the 2022 Energy Code update. [...] The current Express Terms, however, do not presently include SALT or an air systems approach that includes leakage rates from HVAC related equipment. We remain hopeful the CASE team and staff will continue to pursue a systems approach with National SMACNA in lead-up to the next code cycle to better achieve higher accuracy of an HVAC system's actual leakage rates (not just the percent leakage in the ductwork) resulting in the opportunity for comprehensive mitigation efforts and higher energy efficiency savings for all buildings.</p>	<p>Staff appreciates this comment and will look forward to working with the CASE team and SMACNA on more accurate leakage testing in future code cycles.</p>			
238383.002	CAL SMACNA	<p>CAL SMACNA believes that the Energy Code should be amended to clarify that all non-residential duct systems including light commercial buildings and structures be tested in accordance with California Mechanical Code (CMC) Section 603.10.1, including the requirements for representative testing and the requirements to use trained Testing, Adjusting and Balancing technicians to perform the tests.</p>	<p>Staff appreciates the comment, but finds the current language is clear, and that attempts to "clarify" this language may be counterproductive.</p>			
238383.003	CAL SMACNA	<p>The current Express Terms language for NA7.5.3.2 only require conformance to the leakage standards in sections 120.4(g) and 141.0(b)2Dii, which will still allow excessive leakage. Section 141.0(b)2Dii also allows for visual inspection for leak sealing verification, which is insufficient to ensure leaks will be sealed and energy savings realized. CAL SMACNA is concerned that these sections, as currently drafted, will allow light commercial applications and HVAC systems operating in strip malls to become improperly exempted from appropriate testing requirements.</p>	<p>Staff agrees with commentor and will look into this for the next code cycle.</p>			

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238383.004	CAL SMACNA	Single-family and multi-family structures are not the same. HERS training and the entire program itself is designed for evaluating single-family residences. The Express Terms language for NA7.18.1.1 and NA7.18.1.2, however, both require multi-family dwellings ventilation and enclosure leakage acceptance to be verified by a HERS rater. This is non-sensical.	Staff notes that this is an existing requirement and that multifamily buildings have been part of the HERS program for previous code cycles - in relocating provisions applicable to multifamily buildings to a new location within the Energy Code, staff has preserved existing requirements where feasible and not superseded by proposed updates to residential and nonresidential energy efficiency standards. The prior distinction between "low rise" and "high rise" residential buildings did result in HERS requirements applicable for some dwelling units, and staff has not received any information about either the benefits or costs of preventing HERS raters from performing this work. Given the likelihood of adverse economic impact to HERS professionals and the absence of analysis in the rulemaking record, staff did not find it appropriate to make this change at this time. Staff is nonetheless interested in examining the roles and responsibilities of HERS and MATT professionals for inadvertent redundancy, noting that the trigger for MATT requirements was only recently achieved, and would therefore invite the commenter to submit a complete code change proposal on this topic for the next subsequent Energy Code rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238383&DocumentContentId=71185
238383.005	CAL SMACNA	[T]he Express Terms also require multi-family mechanical acceptance testing to be completed by a Certified Mechanical Acceptance Test Technician (MATT), and then requires a HERS rater-verification of that work. MATT technicians are required to have far more extensive knowledge, experience and training than a HERS rater. Having a HERS rater verify the work of a certified MATT technician is redundant, costly and unnecessary for building owners. To avoid confusion and reduce unnecessary cost, burden and energy waste, NA7.18.1.1.2 and NA7.18.1.2.2 should be removed.	Staff notes that this is an existing requirement and that multifamily buildings have been part of the HERS program for previous code cycles - in relocating provisions applicable to multifamily buildings to a new location within the Energy Code, staff has preserved existing requirements where feasible and not superseded by proposed updates to residential and nonresidential energy efficiency standards. The prior distinction between "low rise" and "high rise" residential buildings did result in HERS requirements applicable for some dwelling units, and staff has not received any information about either the benefits or costs of preventing HERS raters from performing this work. Given the likelihood of adverse economic impact to HERS professionals and the absence of analysis in the rulemaking record, staff did not find it appropriate to make this change at this time. Staff is committed to examining opportunities to streamline costs, and would invite the commenter to submit a complete code change proposal on this topic for the next subsequent Energy Code rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238383&DocumentContentId=71185
238384.001	Tanya Herandez (Acuity Brands)	Table 150.0-A: In Item #2 in the table, it states that "Inseparable Solid-State Lighting (SSL) luminaires and colored light sources that are installed to provide decorative, accent, display, utility, undercabinet or special effect lighting." It is unclear if inseparable SSL luminaires no longer have to meet JA8 or is it only inseparable SSL luminaires that are installed to provide decorative, accent, display, utility, undercabinet or special-effect lighting that no longer have to meet JA8.	Staff appreciates the comments. In the 15-day Express Terms, the item in Table 150.0-A for SSL luminaires is the same as the 2019 Code requirements and there is no change for the 2022 Code. In the 45-day Express Terms, the proposed inseparable SSL luminaires - installed for decorative, accent, display, utility, undercabinet and special-effect lighting - to be qualified as high luminous efficacy by default and thereby not required to meet JA8 requirements.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238384

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238384.002	Tanya Herandez (Acuity Brands)	<p>Table 150.0-A: It is unclear if the revised table still requires SSL luminaires with integrated sensors for occupancy and/or daylight sensing to comply with JA8 and be dimmable when these luminaires will save more energy by shutting off than moving to a dimmed level. Although most products with integrated sensors will likely fall under the utility provision of Item #2 of the table, all SSL luminaires with integrated sensors should be considered high efficacy in residential applications to achieve California's carbon reduction goals.</p> <p>Recommendation: Commission staff should conduct an additional rulemaking workshop on residential lighting with an extended comment period to allow for public comment and discussion of all residential lighting and lighting control provisions. Recent market analysis along with energy savings and cost effectiveness data where applicable should be provided for public review.</p>	<p>Staff appreciates the comments.</p> <p>Staff does not find that the presence of a daylighting or occupancy control, integrated or otherwise, impedes the ability of a luminaire to be dimmable or reduces the savings anticipated for this feature. Dimming achieves energy savings while the light is in use, whereas these other controls achieve savings when the light is not needed (either because there is sufficient natural light or because there is no one present to make use of the light). Staff finds that retaining a basic ability for lighting to be dimmed (i.e., to be dimming-compatible) is appropriate.</p> <p>In the 15-day Express Terms, the item in Table 150.0-A for SSL luminaires is proposed to be the same as the 2019 Code requirements and there is no change for the 2022 Code. In the 2019 Code. It is not a requirement and also it does not required SSL luminaires to have integrated sensors for occupancy and/or daylight sensing in order for a SSL luminaire to be qualified for meeting Table 150.0-A</p> <p>The Commission may consider the suggestions of SSL luminaires with integrated sensors for occupancy and/or daylight sensing in future code cycle development subject to future priorities of the Commission.</p> <p>(Someone to add response about the request of additional workshop on residential lighting and with extended comment</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238384
238384.003	Tanya Herandez (Acuity Brands)	<p>Multi-family Residential Buildings - The new Multi-family Residential Building contains several duplications taken from both the Single-Family Residential Buildings and Nonresidential and Hotel/Motel Occupancies sections of the code. While the idea of consolidating the requirements for Multi-family in one section may appear appealing from a code usability standpoint, we are concerned with the potential that the requirements copied directly from single-family and nonresidential section may not get properly updated as single-family or multi-family code language is updated.</p>	<p>The new Multifamily sections and chapters are developed based on many of the requirements from the nonresidential sections and the single family sections - but some requirements of the nonresidential sections and the single family sections are not appropriate and applicable to multifamily buildings.</p> <p>Because of the above differences, the new Multifamily sections are organized uniquely as different from the nonresidential sections and the single family sections.</p>		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238384
238386.001	Southern California Gas Company	<p>As expressed by the Time Dependent Valuation (TDV) analyses, the intended benefits of the proposed code changes are highly sensitive to variables relating to the future customer cost for the electric supply and delivery infrastructure compared to the future cost for gas supply and delivery infrastructure. To the extent that the CEC's projections do not accurately reflect future energy system costs, the assumed benefits may not materialize and could adversely impact public welfare, especially relating to housing affordability (and lack thereof). As discussed in greater detail below, numerous data points, facts and sensitivity analyses suggest that certain assumptions embedded in the Proposed 2022 California Energy Code are either overly optimistic and/or do not reflect the most current data sets - suggesting that cost-effectiveness projections for the cost of electric and gas supply and delivery infrastructure do not reasonably reflect likely outcomes.</p>	<p>On February 24, 2021, the California Public Utilities Commission (CPUC) held an En Banc session. During that En Banc session, the CPUC demonstrated that, contrary to this comment, the retail rate forecast for natural gas is extremely close to the forecast used for TDV through 2035, and lower thereafter if we assume a constant annual growth rate for the CPUC En Banc forecast.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?tn=238386&DocumentContentId=71682

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238386.002	Southern California Gas Company	<p>1. Additional Details are Needed to Fully Understand and Assess Cost-Effectiveness Tradeoffs within the Proposed Code Changes to the Proposed 2022 California Energy Code</p> <p>The California Health and Safety Code establishes nine criteria for the CEC's assessment of prospective updates to the Proposed 2022 California Energy Code, including a required finding that "the cost to the public is reasonable, based on overall benefit to be derived from the building standards."1 Further, the Warren-Alquist Act specifically directs the CEC to reduce the inefficient consumption of energy by prescribing new energy design standards for new residential and nonresidential buildings.2 In doing so, the CEC is required to demonstrate that the standards adopted or revised be cost-effective and consider relevant factors "including, but not limited to, the impact on housing costs, the total statewide costs and benefits of the standard over its lifetime, economic impact on California businesses, and alternative approaches and their associated costs." 3 While other factors may be considered, the State Legislature specifically directed the CEC to assess the impact of energy code amendments on residential housing costs.</p> <p>The CEC estimates a benefit-to-cost ratio for the Proposed 2022 California Energy Code to be 3.5 to 1 (\$8.7 billion in lifetime benefits and \$2.5 billion in lifetime costs). Many of the cost and benefit assumptions, however, are neither clear nor delineated by building sector. The CEC's cost-benefit analyses should</p>	<p>As required by the Warren-Alquist Act and California Health and Safety Code's nine point criteria, staff has evaluated the adopted standards and determined that they are cost effective as a whole. Cost-effectiveness information associated with each measure is available on the docket, and can be found in the relevant CASE report, which forms the basis of the cost effectiveness calculation of each measure and of the standards as a whole.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238386&DocumentContentId=71682</p>
238386.003	Southern California Gas Company	<p>2. Sensitivity Analyses Are Needed for Operation and Maintenance Cost Assumptions and Gas Prices</p> <p>Sensitivity analyses provide a way to manage the uncertainty inherent in data analysis. In a 2017 report assessing how regulatory agencies can improve their analyses, the California Legislative Analyst Office (LAO) found that most state agencies do not adequately assess uncertainty and that sensitivity analyses "provides the agency and the public with a better understanding of the risks—both positive and negative— of a particular approach." 7 To this end, SoCalGas performed a fairly straightforward assessment on the operation and maintenance (O&M) costs for HPWHs to determine the sensitivity of the economic analysis used by the CEC to validate the Proposed 2022 California Energy Code changes, based on the economic comparison between the gas and electric technology options. Our analysis shows a thin cost-effectiveness margin between electric and gas appliances that is sensitive to small deviations from retail electricity or gas prices. Accordingly, it appears very likely that the proposed code changes may not achieve the expected greenhouse gas (GHG) reductions per dollar spent, and consequently may not be the most cost effective approach. For the detailed sensitivity analysis, please see Appendix A.</p> <p>Admittedly SoCalGas does not have access to the full range of modeling tools used by the CEC so as to fully replicate the CEC analysis. Hence different elements of the forecast are expected</p>	<p>Thank you for the comment. Staff evaluated this comment and observes all of the proposed 'sensitivities' suggested favor natural gas use. Staff notes that there are an equal number of possible changes that would favor electric use. Staff further notes adjusting assumptions to favor one outcome over another neither provides additional information nor improves the effectiveness of the model. Instead, adjusting such assumptions only serve to reinforce that pre-selected outcome, rather than supporting data-driven policymaking. Since this is a building standards proceeding, staff must ultimately define a single building code based on the best available outlook. The suggestions in this comment are not consistent with this approach. For these reasons, we believe an expected value forecast that uses the best publicly available data at the time it was developed is appropriate, and decline to adopt this comment's suggestions.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238386&DocumentContentId=71682</p>

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238386.004	Southern California Gas Company	<p>We further note that a more recent and accurate forecast of natural gas costs is available and strongly recommend that the CEC undertake sensitivity analysis to examine the results of the Proposed 2022 California Energy Code cost-effectiveness analysis using a more reasonable gas price forecast. As presented in Appendix B to these comments, the natural gas costs used in the Proposed 2022 California Energy Code analysis are based on an outdated forecast that overstates current market expectations regarding future natural gas costs. Specifically, the Retail Rate Adjustment is based on an inaccurate and simplistic assumption for natural gas system costs that significantly overstates expected retail natural gas prices. Moreover, we provide in Appendix B data suggesting that the Proposed 2022 California Energy Code analysis dramatically overstates low carbon gas supply costs, particularly for hydrogen, relative to current industry expectations and only includes conservative estimates of biogas potential.</p>	<p>On February 24, 2021, the California Public Utilities Commission (CPUC) held an En Banc session. During that En Banc session, the CPUC demonstrated that, contrary to this comment, the retail rate forecast for natural gas is extremely close to the forecast used for TDV through 2035, and lower thereafter if we assume a constant annual growth rate for the CPUC En Banc forecast.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/getfile.aspx?en=238386&DocumentContentId=71682
238386.005	Southern California Gas Company	<p>A more realistic assessment of future retail natural gas prices would result in lower prices and lower customer attrition. Similarly, a more realistic assessment of low carbon gas supply costs would lead to additional low carbon gas supplies and similar GHG emissions reductions. Lastly, a lower retail natural gas price could change the cost relationship between natural gas and electricity in many of the new building applications assessed in the Proposed 2022 California Energy Code analysis leading to different recommendations based on the economic comparison of natural gas and electric end-use options. If the sensitivity case results in significant changes to the results of the Proposed 2022 California Energy Code analysis, we respectfully request that the CEC conduct a more rigorous analysis of the gas price forecast before finalizing the proposed code changes to the Proposed 2022 California Energy Code. Details addressing the forgoing considerations for the CEC forecast, no/low carbon gas supply costs, and biogas potential can be found in Appendix B.</p>	<p>A comparison of the assumed costs for biofuel are very near the <i>low</i> end of the range from a recent American Gas Foundation Study. Staff agrees that the projected technology and delivered hydrogen costs are now lower than when our source data was developed for TDV. However, since the volume is so small and so far in the future, even an optimistic assumption on hydrogen cost of \$10/MMBtu would only reduce the overall 30-year leveled TDV costs by an insignificant \$0.06/therm relative to the assumptions made in this code cycle.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/getfile.aspx?en=238386&DocumentContentId=71682
238386.006	Southern California Gas Company	<p>Likewise, we note that the gas supply costs associated with the operation of the combined cycle gas turbine (CCGT) resources are likely understated. According to the CEC analysis, the cost of the CCGT assets is constant in real terms after 2031 as indicated in Figure 1. 8</p> <p>However, this assumption is at odds with the need to maintain the means by which CCGTs obtain fuel (the gas transportation and distribution networks) over the same period during which throughput and distribution customer count are projected to decrease. In practical effect, CCGTs will be bearing more of the gas system costs (including for firm transportation service) with fewer units of electricity production, which will result in a corresponding increase in the costs for electricity and output. Because gas throughput will decline and infrastructure costs will not decline commensurately, the electricity prices from CCGT will not remain constant after 2031 but will likely increase. Please see Appendix C for additional detail.</p>	<p>CEC staff believes, based on available modeling data, that this second order affect would be small since natural gas delivery costs are such a small portion of the overall costs of purchasing and operating a combined cycle gas plant. The change also would be later in the 30-year period of analysis and would have a diminishing impact on present value TDV costs. Also, the SCG perspective on this component of TDV presumes that a cost shift of this type significant enough to be meaningful in overall electricity rates would be approved by the CPUC which is uncertain.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/getfile.aspx?en=238386&DocumentContentId=71682

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238386.007	Southern California Gas Company	<p>3. Further Analysis of the Interactive Effects of Heat Pump Water Heaters with Heating, Ventilation and Air Conditioning System.</p> <p>Heat Pumps are a proven technology, reducing energy consumption and carbon emissions across all building types, as validated by the CEC's in-depth analysis of the performance and overall cost effectiveness of heat pumps compared to other alternatives. We note, however, some areas where the CEC analysis overlooks, variability in the costs of installing and operating a heat pump for water or space heating. The Proposed 2022 California Energy Code requires the storage tank of HPWHs to be in the garage or in a conditioned space. A HPWH, when installed in a conditioned space, interacts with the heating, ventilation, and air conditioning (HVAC) system by extracting heat from the space in which it is located. This includes a cooling bonus in the summer and a heating penalty in the winter. In the "Single Family Heat Pump Documentation,"⁹ these interactive effects are accurately captured since both heat pump space heaters (HPSHs) and HPWHs are modeled together. Their cost-effectiveness is analyzed against gas furnaces and gas instantaneous water heaters, respectively. However, for mixed fuel homes where a HPWH is installed and a gas furnace is used for space heating, the heating penalty induced by the HPWH on the gas consumption could be significant. We are unaware of any assessment, that analyzes the interactive effects between HPWHs and gas-based space heating on the cost-effectiveness of mixed fuel homes, especially in climate zones with substantial</p>	<p>The CEC modeling tools such as CBECC-Res and the CASE analysis fully considers the interactive effects between HPWH and space conditioning equipment throughout the year, for every hour of the year, which includes summer cooling and winter heating loads. Additionally, garage installation is the predominate practice for newly constructed single family homes and the interactive effect is minimal.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238386&DocumentContentId=71682
238386.008	Southern California Gas Company	<p>4. Proposed Requirements for Kitchen Exhaust Systems and Range Hood</p> <p>Ventilation Cooking is a well-recognized source of particulate matter (PM) in homes. PM is primarily emitted from the cooking process (i.e., frying, sautéing, toasting, etc.) and the emissions are similar whether the energy source of the stove is gas or electric. We recommend using a single capture efficiency standard for each dwelling unit size regardless of fuel source. We believe that this will be more health-protective and will decrease all indoor pollutants to a greater extent. Despite the public health benefits ventilation offers, a survey conducted by Lawrence Berkeley National Laboratory (LBNL) ¹⁰ shows that many people do not use their range hoods because they think the hood is not needed, simply forget it is there, or find it is too noisy. We suggest the CEC consider range hoods that turn on automatically when the stove is in use. This strategy has been used in Japan and has been found to be effective.¹¹ We also recommend that more engineering work be performed to develop quieter hoods so that people are more likely to use them. Please see Appendix D for additional details.</p>	<p>All cooking generates particulate matter and other aerosolized compounds, <u>and natural gas cooking additionally produces nitrous oxides, carbon monoxide and other compounds resulting directly from combustion.</u> Therefore, a gas cooking event that adds both combustion byproducts and cooking byproducts to the indoor air necessarily creates a greater mass of pollutants in need of removal compared to one that only adds cooking byproducts, and a higher airflow rate will logically be needed to transport that greater pollutant mass.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238386&DocumentContentId=71682

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238386.009	Southern California Gas Company	<p>5. Risks Associated with Battery Storage Assumptions</p> <p>The data sources used by the CEC for estimating the costs of residential energy storage are reputable and appear reasonable. However, residential energy storage lacks manufacturers and historical data to estimate costs as accurately as utility storage. Therefore, the risks associated with availability, reliability, and operations and maintenance should be considered in addition to energy storage costs. Please see Appendix E for more details.</p>	Recent projections by NREL and Bloomberg NEF indicate that the cost of installed battery storage systems will continue its decline through the year 2030 across all market sectors, including residential, nonresidential, and utility scale sectors. Appropriate charts have been provided to demonstrate this cost declining trends for battery storage systems.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238386&DocumentContentId=71682
238387.001	QC Manufacturing Inc., Just	<p>4.1.1 We are in agreement with the findings, the current default degradation factor of 67% is not realistic, and unjustly penalizes builders in compliance software when HERS rating is not performed. In addition, having the software degrade the modeled airflow by 67%, results in almost 75-90% of all EDR compliance gains to be removed, as we are seeing as little as 0 EDR points compliance difference in climate zones 9,11,13-14.</p> <p>This 67% degradation should be adjusted to a 33% degradation when HERS verification is not selected.</p>	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238387&DocumentContentId=71688
238387.002	QC Manufacturing Inc., Just	<p>4.1.2 This is no longer an issue in 2019 code. QC Manufacturing and any other whole house fan manufacturers must provide T24 engineers precise specifications on cfm/watts that the fans are able to attained in the field, and the installation of adequate code required 1/750 NFVA venting is REQUIRED in order for any fan to hit that in the field. We have over 1000 homes passed on the state registry with 2019 HERS tested values, and 100% of those homes had the code required venting of 1 /750 NFV A. If even 1 sq of venting is missing, will result in a HERS failure of 100-400 cfm.</p> <p>No further degradations are required to ensure adequate ventilation is installed, as the HERS measure itself resolves this matter.</p>	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238387&DocumentContentId=71688
238387.003	QC Manufacturing Inc., Just	<p>4.1.2 This is no longer an issue in 2019 code. QC Manufacturing and any other whole house fan manufacturers must provide T24 engineers precise specifications on cfm/watts that the fans are able to attained in the field, and the installation of adequate code required 1/750 NFVA venting is REQUIRED in order for any fan to hit that in the field. We have over 1000 homes passed on the state registry with 2019 HERS tested values, and 100% of those homes had the code required venting of 1 /750 NFV A. If even 1 sq of venting is missing, will result in a HERS failure of 100-400 cfm.</p> <p>No further degradations are required to ensure adequate ventilation is installed, as the HERS measure itself resolves this matter.</p>	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238387&DocumentContentId=71688

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238387.004	QC Manufacturing Inc., Just	<p>4.1.2 This is no longer an issue in 2019 code. QC Manufacturing and any other whole house fan manufacturers must provide T24 engineers precise specifications on cfm/watts that the fans are able to attained in the field, and the installation of adequate code required 1/750 NFVA venting is REQUIRED in order for any fan to hit that in the field. We have over 1000 homes passed on the state registry with 2019 HERS tested values, and 100% of those homes had the code required venting of 1 /750 NFV A. If even 1 sq of venting is missing, will result in a HERS failure of 100-400 cfm.</p> <p>No further degradations are required to ensure adequate ventilation is installed, as the HERS measure itself resolves this matter.</p>	This comment is pertaining to the Alternative Calculation Method and CBECC-Res software, and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238387&DocumentContentId=71688
238387.005	QC Manufacturing Inc., Just	4.2 RA 3.9.4.1.1 Thank you for eliminating the front door blower door test and replacing it with the new attic pressure matching method described in section 4.3.	Staff appreciates the comment of support.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238387&DocumentContentId=71688
238387.006	QC Manufacturing Inc., Just	4.2 RA 3.9.4.1.3 We agree the passive flow hood method should be removed for the reasons listed by Mr. Springer. It should no longer be an approved device for testing whole house fans, as the highest measurable airflow rate is not even 40% of the average airflow rate of a whole house fan system.	The CASE Report notes that the passive flow hood method can measure up to 2,500 cfm and thus limited to a house up to 1,667 sf. Because of this, staff finds that this method can still be used.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238387&DocumentContentId=71688
238387.007	QC Manufacturing Inc., Just	<p>4.3 New Attic Pressure matching method listed in new RA 3.9.4.1.1</p> <p>We are not in opposition to this new method, as the results look promising.</p> <ul style="list-style-type: none"> • It allows vertical mounted WHF to be tested using the method. • It allows for testing of WHF mounted over structural items such as stairs and built-in cabinets. <p>This method has not been properly tested with a wide variety of products to include</p> <ul style="list-style-type: none"> • Direct drive, PSC, ECM belt driven products may react differently to this test • This method has not been tested on homes with 2 or 3 whole house fans • It has not been tested on single/2story/3 story homes extensively • This method should require CEC approved and HERS WHF certified equipment, just as other WHF airflow devices have been made to obtain CEC approval for airflow measurement devices. • HERS raters should not be allowed to create their own airflow verification devices, as the results will be unstable, and can affect the measurement apparatus adversely, and also affect whole house fan performance adversely. • This method is not viable for roof mounted WHF that direct vent to the outside, as there would be no attic pressure to 	Staff appreciates the comment of support. The test sample and results are as mentioned in the CASE Report and concluded that the new method was relatively accurate. If cases emerge that contradict this conclusion, this topic can be revisited in the future.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238387&DocumentContentId=71688

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238388.001	Consol	We, like Unico, agree with the analysis carried out for the Energy Commission that condensation may occur on uninsulated ductwork in conditioned space under certain conditions. Where we disagree is on the impact of the small amount of condensation that may be formed (see ConSol's comments in TN # 238140). The minimal volume of water likely to condense on the duct surface, combined with the cyclical nature of the condensation/evaporation process makes it highly unlikely that any structural damage or mold will occur as a result. Without knowing more details, we are unable to comment on the one example given by Unico of problems occurring in a basement installation. This should be considered alongside the comments submitted by seven of the country's largest builders (Beazer Homes, DR Horton, Lennar, Pulte Group, Taylor Morrison, Toll Brothers, and Tri Pointe Homes) noting that they have all used uninsulated ducts in conditioned space throughout the country without issue.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238388&DocumentContentId=71493
238388.002	Consol	Thermal losses from uninsulated ducts will, as noted, be higher than from insulated ducts. However, with ducts in conditioned space these losses will be to the conditioned space and will therefore not lead to increased loads or wasted energy. Properly designed and balanced systems will account for these losses and ensure that conditioned air is supplied to rooms at appropriate rates. We believe that, Unico's comments notwithstanding, our original interpretation of the analysis relied on by the Energy Commission is correct and that requirements for insulation on ducts in conditioned space are unnecessary and unduly restrictive.	Thank you for the comment. Staff addressed this by adding revisions to the adopted standards that removed the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238388&DocumentContentId=71493
238389.001	Environmental Entrepreneurs (E2)	As members and supporters of E2 (Environmental Entrepreneurs), we are writing in support of the direction of the California Energy Commission's (CEC) Title 24 proposal and strongly encourage further ambition. As currently drafted, these standards would incentivize home builders to transition to all-electric new construction in California. However, the current proposal does not extend electrification incentives to the heating systems commonly used in many large residential and commercial buildings such as packaged units and central systems. This current gap in incentives is a lost economic opportunity. A code that incentivizes the construction of all-electric buildings across all building classes is a critical step to advancing all-electric building construction. The CEC should strengthen its proposal to ensure our building code adequately confronts the climate crisis while reducing construction and building operating costs in California, as well as catalyzing significant job growth in our state's clean energy economy.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238389&DocumentContentId=71490

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238389.002	Environmental Entrepreneurs (E2)	Simply put, California must do more to address emissions in the built environment. Strengthening the 2022 code to provide electrification incentives for all building classes will set all new construction on a transition path to run on clean electric energy and ensure policymakers capture one of the most significant opportunities to mitigate climate emissions in California's economy. Title 24 is the tool to make these changes happen and the 2022 code update presents a unique opportunity to ensure California remains a leader in building codes and climate action.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238389&DocumentContentId=71690
238389.003	Environmental Entrepreneurs (E2)	Title 24 presents an important opportunity to advance California climate action and realize economic benefits. As currently proposed, the 2022 Title 24 code updates move in the right direction but fall short of covering all major building types, particularly large commercial and residential buildings. As business leaders who are creating jobs and driving economic growth in California, we thank you for your leadership and urge you to transition all new buildings to clean electric construction in the building code as soon as possible. For additional information, please contact Andy Wunder at awunder@e2.org.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238389&DocumentContentId=71690
238390.001	SunPower Corporation	Section 140-10 (a): Exception 5 of Section 140-10(a) applies to multi-tenant buildings in areas where a load serving entity does not provide either a Virtual Net Metering (VNEM) or community solar program. However, we assert that this exception is unnecessary and would allow for missed opportunities within the market as it could impact a substantial percentage of the multi family projects outside of the IOU territory. Installing solar in non-VNEM areas is still very feasible and cost-effective to residents, which SunPower would gladly demonstrate through our internal data and cost analyses. We recommend this exception be removed from the draft language.	Staff determined that the exception is necessary given that this situation can potentially cause a customer not to receive any monetary benefit for installed solar photovoltaics, while still paying passed-on costs for the system. In such cases, any cost above zero would cause the system to not be cost effective. Staff therefore finds retention of the exception to be appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238390&DocumentContentId=71689
238390.002	SunPower Corporation	Section JA11.5.1: While we are grateful for the added language that incorporates the "building owner" and "manager" with the "dwelling occupant", we believe some of the requirements are still overly-prescriptive for non-residential units. We recommend loosening the standards for commercial units, such as: <ul style="list-style-type: none"> • Removal of the web-based portal requirement, or make it optional – mobile devices do not have much application for commercial enterprises. The current language states "and a mobile device application". Suggested change: "or a mobile device application". • Removal of the mandate for the "number of PV modules and nominal watt rating of each module" [Item (b)]: this mandate does not have utility in commercial enterprises. It is more important to measure the performance against the nominal kW rating of the entire system, which is already reflected in [Item (a)]. • Define the meaning of "current" in [Item (f)] to include the allowance of lag. We recommend a lag time of one hour, in accordance with the specifications noted in [Item (c)]. 	Staff finds that specific information about the panels is necessary for tracking performance and identifying and resolving issues (for example, lowered output relative to rating leading to a panel being cleaned to remove dust or plant debris that impeded its performance). Staff does not find that aggregated systemwide information provides the same diagnostic benefit. <p>Staff finds that there is sufficient overlap between a web app and a web page for a single portal to serve both as a mobile and desktop interface for providing the noted information - the language as written ensures that the portal will perform in both contexts.</p> <p>Staff notes that "current" is intended to have its ordinary dictionary definition; staff is intentionally erring on the side of not expressly defining "current" so as to allow for reasonable delays without being overly specific or prescriptive either with regards to timing or to types of delay (with the requirement in (c) acting as a natural upper limit).</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?tc=238390&DocumentContentId=71689

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238390.003	SunPower Corporation	Section 10-115 (a)(6): We support the addition of a location requirement to the community solar compliance option, but we ask that the language, through a more concise reference to the term "distribution system", call for Community Solar installations to be closer to the communities they serve. The section currently states: "The community shared solar electric generation system and/or community shared battery storage system shall be located on a distribution system of the load serving entity providing service to the participating buildings." We ask the Commission to amend the language in the section to read, "The community shared solar electric generation system and/or community shared battery storage system shall be located on the distribution system of the participating buildings." The change in the language would ensure a greater and more supportive representation of the interests for the communities they serve.	Staff finds that the commenter's recommendation would be too limiting: solar farms may be zoned as industrial and local zoning laws may not allow them to be located near residential or commercial property. Smaller CS systems may be able to be located on carports or roofs of buildings near the development, but no applications have been submitted to the CEC for such CS systems; there would be no restriction on PV systems being located on the same distribution system. CSSA's national guidelines for CS systems do not recommend a limitation to the same distribution system as the participants.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238390&DocumentContentId=71689
238390.004	SunPower Corporation	Section 10-115 (a)(4) and Section 10-115 (a)(8): We appreciate the Commission's recognition for the need to allow buildings to opt out of community solar programs if they choose to do so. However, we remain concerned that the revised language may not provide sufficient protections for customers that choose to opt out of community solar programs and install solar onsite to meet the code requirements. We recommend the Commission include language that clarifies that customers cannot be unduly burdened by community solar providers in such a manner that would make opt-out infeasible. We recommend including language that prohibits onerous exit fees or other unreasonable barriers on customers' ability to opt out of community solar programs. Specifically, SunPower recommends the following amendment to Section 10-115(a)(4): "At the time of interconnection of that on-site solar electric generation system, all costs associated in the community shared solar and/or battery storage system shall cease and no punitive fees will be charged."	Staff agrees with the comment and the adopted language included similar opt-out language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238390&DocumentContentId=71689
238390.005	SunPower Corporation	Section JA11.1: It is our understanding that the scope of Joint Appendix JA11 provides the qualification requirements for photovoltaic systems to meet the prescriptive or performance standards for single-family residential buildings as well as nonresidential buildings. However, the "Purpose and Scope" paragraph for JA11 only refers to Sections 150.1(b) and 150.1(c). We recommend incorporating language to broaden the purpose and scope to include Sections 140.10, 160.8(a) and 170.2(f)(g) and (h).	Staff agrees with the comment and the adopted JA11 language included references to the multifamily sections	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238390&DocumentContentId=71689
238390.006	SunPower Corporation	JA11.4.1 D: Current language: If the solar assessment tool model shading condition based on satellite or drone images, the annual solar access percentage values shall be comparable to on-site measurements. Suggested change: If the solar assessment tool model shading condition based on satellite or aerial images, the annual solar access percentage values shall be comparable to on-site measurements.	Staff agrees with the comment and the adopted JA11 language reflected this change	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238390&DocumentContentId=71689

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238390.007	SunPower Corporation	Section 170.2(f)(g): Given the fact that the formulas used to determine the kW for PV are different between residential vs non residential, the threshold of three habitable stories may be considered arbitrary and could cause confusion for builders with respect to the PV requirements. We recommend greater clarity to why multifamily buildings with "three habitable stories or less" was placed under the residential section of the code and why multifamily buildings with "more than three habitable stories" was placed under the non-residential section of the code.	Section 170 is a completely new section for multifamily and not part of the nonresidential section. No change needed	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238390&DocumentContentId=711685
238391.001	New Buildings Institute	Electric-Ready: With an increasingly renewable energy grid, electrification both reduces carbon emissions and improves the health of a building's occupants. Making new buildings electric-ready costs very little at the time of construction and will ensure that new homes fueled by gas will be able to affordably upgrade to electric appliances in the future. NBI therefore supports the electric-ready provisions for space heating, water heating, and cooking in Title 24.	Thank you for the support.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238391&DocumentContentId=71701
238391.002	New Buildings Institute	Grid Integrated Buildings: Building-grid integration is critical to supporting California's decarbonization efforts. Grid integrated buildings support the reduction of fossil fuels by shifting energy use away from the times of the day when renewable energy sources are undersupplying the grid. NBI supports the proposal to allow compliance credit for thermal energy storage technologies beyond the existing chuld water systems and measures to simplify and streamline requirements for demand responsive controls. NBI also supports the proposed demand responsive lighting control and demand responsive water heating requirements in Title 24. NBI, however, recommends, that the CEC revise the proposed grid connectivity requirements for water heaters which currently reference ANSI/CTA-2045-A. Grid connectivity requirements should reference ANSI/CTA-2045-B which was published in November of 2020. ANSI/CTA-2045-B is a more advanced communication interface for water heaters which allows grid operators to require water heaters to both shed demand and load up, allowing better integration with time-of-use rate structures. ANSI/CTA-2045-A only allows grid operators to require water heaters to shed demand but not load up. Therefore, water heaters utilizing this protocol cannot be integrated with time-of-use rate structures.	Thank you for the support. This revision was included.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238391&DocumentContentId=71701
238391.003	New Buildings Institute	Required Lighting Efficacy Levels for Horticultural Applications: The Title 24 proposal to require a photosynthetic photon efficacy of 1.9 µmol/J for horticultural lighting systems used in indoor growing applications and 1.7 µmol/J for horticultural lighting systems used in greenhouses is cost effective with no adverse impacts to growers. Because of these benefits, these efficacy requirements are setting a precedent demonstrated by current consideration in ASHRAE 90.1 and have already received preliminary approval in Washington State, Minnesota, Washington, DC and Vermont.	Thank you for the comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238391&DocumentContentId=71701

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238392.001	Coalition for Community So	<p>Section 10-115 – Community Shared Solar Electric Generation System or Community Shared Battery Storage System Compliance Option for On-Site Electric Generation or Battery Storage Requirements</p> <p>CCSA has generally been supportive of the directional adjustments and/or clarifications proposed for the 2022 California Energy Code. For example, CCSA strongly supports the proposed "Location" parameters that would require community shared solar systems to be located anywhere in the utility service territory of a participating building so long as that system is on a distribution system. As mentioned in our May 5 comments, this requirement would balance the ability to leverage economies of scale and system optimization while also providing real distribution system level benefits to the grid, comparable to the rooftop solar project that would otherwise be used for compliance. In addition, CCSA appreciates the clarification proposed for "Additionality", which would confirm that other renewable resources could play a role in filling before and after time gaps that could inevitably occur between solar system development and operation and a participating building.</p>	<p>This is too limiting. Solar farms may be zoned as industrial and local zoning laws may not allow them to be located near residential or commercial property. Smaller CS systems may be able to be located on carports or roofs of buildings near the development, but no applications have been submitted to the CEC for such CS systems; there would be no restriction on PV systems being located on the same distribution system. CCSA's national guidelines for CS systems do not recommend a limitation to the same distribution system as the participants.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238392&DocumentContentId=71700
238392.002	Coalition for Community Solar Access	<p>• Establishment of Community Solar Tariffs and Programs – As CCSA and SEIA raised in our March 9, 2021 comments, without a viable community solar tariff in investor-owned utility (IOU) territory community shared solar will not be able to support Title 24 compliance for the vast majority of new construction occurring in California. In our May 5, 2021 comments, we highlighted our current efforts to establish a viable community solar program in IOU territory. This includes a value-based community solar program tariff proposal in the Net Energy Metering tariff proceeding, R.20-08-020 (hereafter the "net metering revisit" proceeding); as well as a Petition for Modification with the CPUC to provide rate stability in the Enhanced Community Renewables (ECR) program (part of the Green Tariff Shared Renewable program). While an improved rate structure for the ECR program could potentially enable it to support Title 24, it would only offer a short-term community solar solution as its limited by capacity (just a couple hundred megawatts) as well as geography (for bundled IOU customers only). Hence, in order for community solar to become an ongoing option for Title 24 compliance a tariff, such as what CCSA has put forth before the CPUC, is needed. As noted in our March 9, 2021 comments, CCSA urges the Commission to coordinate with the CPUC to develop tariffs and programs that will support the development of community solar projects at scale.</p>	<p>Thank you for the comment. There is ongoing coordination with CPUC on potential of changing ECR program requirements to make compliant CS programs possible in IOUs; progress is largely dependent on solar industry making proposals for CPUC to revise rules to allow costs imposed on solar developers to make non-participants neutral to be based on the E3 avoided cost calculator – solar developers stalled on commitment to do so</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238392&DocumentContentId=71700

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238392.003	Coalition for Community So	<ul style="list-style-type: none"> Participating Building Energy Savings Benefits. CCSA recommends a clarification and/or consideration of an additional scenario (if needed) by which a "reduction in the building's energy bill" could be demonstrated. Section 3.c states that "payments to the building that will have an equivalent effect as energy bill reductions," may be used to demonstrate a reduction in the building's energy bill. CCSA clarifies that while this bill reduction could be in the form of an actual "payment," it would more likely be a direct monetary credit applied to the participant's electricity bill. This may be the current assumption for the code language, but the language is somewhat unclear. Notably, CCSA's proposal in the net metering revisit proceeding includes the option to utilize "net crediting", whereby the utility would deduct the customer's bill and remit the subscription price to the community solar system owner. This provides an even further simplified billing experience for the customer where they do not need to worry about multiple transactions. 	Staff determined that the proposed language is broad enough as written to allow generally for scenarios such as the one suggested by the commenter; staff therefore determined that no change to the language was necessary.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?m=238392&DocumentContentId=71200
238392.004	Coalition for Community So	<ul style="list-style-type: none"> Durability and Building Opt-Out. CCSA generally supports flexibility for participants to subscribe to, or drop out from, a community solar project. It is a consumer protection which CCSA advocates for as a general policy in community solar programs across the country. That said, this policy is premised on the ability to backfill subscriptions by replacing any participants that exit before the end of the project life or supporting tariff. In a healthy community solar market, this is not a major issue as there are typically waitlists of consumers that would be interested in subscribing, regardless of whether there is 20 years remaining on the subscription or 5 years. However, in California, if a community shared solar provider intended to only serve buildings for Title 24 compliance, it could be more difficult to find replacement (backup) buildings. This is particularly true if the shared solar project was no longer able to offer 20-year agreements due to the remainder of its project life, tariff, or other community solar program (such as ECR) limitations. 	Nothing in 10-115 disallow the community solar project from serving customers not associated with Title 24 compliance. Adopted language clarified this.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?m=238392&DocumentContentId=71200
238392.005	Coalition for Community So	<ul style="list-style-type: none"> Additionality. As noted previously, CCSA appreciates the effort in the proposed 2022 California Energy Code to clarify that "other renewable resources" can be leveraged for filling front and/or back-end gaps for serving participating buildings. That said, CCSA would clarify that these community shared solar systems can in fact also serve other customers not associated with Title 24 compliance. This flexibility is critically important, especially in light of the currently proposed "opt-out" provisions. 	Nothing in 10-115 disallow the community solar project from serving customers not associated with Title 24 compliance. Adopted language clarified this.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?m=238392&DocumentContentId=71200
238392.006	Coalition for Community So	<ul style="list-style-type: none"> Original Building Purchaser Choice. CCSA recommends deleting this component of the proposed Title 24 revisions, as it seems disruptive to market realities and project development timelines. Both solar project (particularly community-scale) and home construction can work on long timelines, from early development and financing to ultimate construction and completion. Depending on who the "original building purchaser" is, this entity may not be a part of the equation when such a decision is made. 	Staff agrees and the proposed language reflect this change. We deleted the Original Building Purchaser Choice provision.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?m=238392&DocumentContentId=71200

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238392.007	Coalition for Community So	<ul style="list-style-type: none"> Application for Commission Approval. CCSA recommends the Commission clarify who is considered the "administrator" of a community solar generating system in the context of a community solar program where there are multiple independently developed/owned projects under a common set of program rules. This currently remains unclear under the regulations and guidance documents. 	The applicant to the CEC for approval of the CS program is the administrator; there is a potential for the ECR to become usable upon CPUC rule changes; if that occurs the CEC should consider the possibility of a central administrator that would cause all requirements to be met for multiple solar developers operating in different parts of the state – this could be a task for CALSSA, CSSA or SEIA for example – that could occur without change to the regulations	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238392&DocumentContentId=71200
238392.008	Coalition for Community So	<ul style="list-style-type: none"> Executive Director Approval of Revised Applications. CCSA appreciates the process proposed here for a revised application to go through the Commission's Executive Director. However, CCSA is concerned with the potential risk inherent in requiring a revised application anytime the "Commission modifies the requirements of Section 10-115 in a building standards rulemaking". This creates uncertainty with regards to potential implications, economic or other, on a community shared solar project that was unforeseen at the time the project was originally approved as a compliance mechanism. Projects should be able to be safe-harbored in the requirements they were under at the time they were approved to operate in the program. This is general best practice and an important assumption regarding regulations across market sectors. Things should change going forward, but the uncertainty of retroactive impacts can undermine project financeability. 	Staff agree and the adopted language do not retroactively apply to participating homes approved under prior Standards or to renewable resources already approved by the Commission.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238392&DocumentContentId=71200
238393.001	Larua Rosenberger	Require all electric buildings in the California code. Require all electrical appliances since natural gas is harmful since it releases Nox indoor cooking. It harms low-income people living in small apartment even more. There will be enough electricity available for California's buildings since people will drive our cars less than now, leaving enough electricity to power building space heating.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238393&DocumentContentId=71698
238394.001	New Buildings Institute	1. Electric-Ready: With an increasingly renewable energy grid, electrification both reduces carbon emissions and improves the health of a building's occupants. Making new buildings electric-ready costs very little at the time of construction and will ensure that new homes fueled by gas will be able to affordably upgrade to electric appliances in the future. NBI therefore supports the electric-ready provisions for space heating, water heating, and cooking in Title 24.	Staff appreciate the support	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238394&DocumentContentId=71698

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238394.002	New Buildings Institute	2. Grid Integrated Buildings: Building-grid integration is critical to supporting California's decarbonization efforts. Grid integrated buildings support the reduction of fossil fuels by shifting energy use away from the times of the day when renewable energy sources are undersupplying the grid. NBI supports the proposal to allow compliance credit for thermal energy storage technologies beyond the existing chld water systems and measures to simplify and streamline requirements for demand responsive controls. NBI also supports the proposed demand responsive lighting control and demand responsive water heating requirements in Title 24. NBI, however, recommends, that the CEC revise the proposed grid connectivity requirements for water heaters which currently reference ANSI/CTA-2045-A. Grid connectivity requirements should reference ANSI/CTA-2045-B which was published in November of 2020. ANSI/CTA-2045-B is a more advanced communication interface for water heaters which allows grid operators to require water heaters to both shed demand and load up, allowing better integration with time-of-use rate structures. ANSI/CTA-2045-A only allows grid operators to require water heaters to shed demand but not load up. Therefore, water heaters utilizing this protocol cannot be integrated with time-of-use rate structures.	Staff agrees with the comment and the adopted language reflected this change	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238394&DocumentContentId=71698
238395.001	Taylor Engineering	EXCEPTION 1 to Section 120.1(c)3: Designed Occupancy requires that the AHJ allows this option to occur. This is an unnecessary burden to designers. Instead, delete the Exception to Section 1004.5 of the CBC and reinstate the assumption in earlier versions of Title 24 that specifies that the density of occupants shall not be less than half of the exiting density required by CBC Chapter 10	This exception follows requirements from the California Building Code. This exception is allowed to ensure that occupancy allowances identified for the building officials can be used.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238395&DocumentContentId=71697
238396.001	SEIA	1. Establishment of Community Solar Tariffs and Programs As a threshold matter, it is important to note that California still does not have a viable community solar tariff to support community solar project development throughout most of the state. This is currently the most significant roadblock to unlocking community solar in California. If there is no means by which community solar projects can be compensated for the benefits they provide, then community solar projects will not be built. This is an urgent issue that must be addressed to make the community solar compliance option viable. SEIA urges the Commission to coordinate with the California Public Utilities Commission and other state agencies to develop tariffs and programs that will support the development of community solar projects at scale.	Thank you for the comment; there is ongoing coordination with CPUC on potential of changing ECR program requirements to make compliant CS programs possible in IOUs; progress is largely dependent on solar industry making proposals for CPUC to revise rules to allow costs imposed on solar developers to make non-participants neutral to be based on the E3 avoided cost calculator – solar developers stalled on commitment to do so	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238396&DocumentContentId=71696

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238396.002	SEIA	<p>2. Ensure Customer Optionality (Section 10-115(a)(4); Section 10-115(a)(8)) SEIA appreciates the Commission's recognition for the need to allow buildings and customers to opt out of community solar programs if they choose to do so. However, SEIA remains concerned that the revised language may not provide sufficient protections for customers that choose to opt out of community solar programs and install solar onsite to meet the code requirements. SEIA recommends that the Commission include language that clarifies that customers cannot be unduly burdened by community solar providers in such a manner that would make opt-out infeasible. SEIA recommends including language that prohibits onerous exit fees or other unreasonable barriers on customers' ability to opt out of community solar programs. Specifically, SEIA recommends the following amendment to Section 10-115(a)(4): "At the time of interconnection of that on-site solar electric generation system, all costs associated in the community shared solar and/or battery storage system shall cease and no punitive fees will be charged." 2</p> <p>To implement this requirement in a workable fashion, the Commission should require applicants to address this issue up front in their application. For applicants with individual projects, the Commission should consider allowing an attestation by the applicant not to impose an onerous or punitive exit fee on customers. In the case of projects developed under a common set of program rules, the Commission may look to the program</p>	Staff agree with the comment and the adopted language reflects the change	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238396&DocumentContentId=71696
238396.003	SEIA	3. Application for Commission Approval (Section 10-115(b)) The Commission should clarify who is considered the "administrator" of a community solar generating system in the context of a community solar program where there are multiple independently developed/owned projects under a common set of program rules. This currently remains unclear under the regulations and guidance documents.	The applicant to the CEC for approval of the CS program is the administrator; there is a potential for the ECR to become usable upon CPUC rule changes; if that occurs the CEC should consider the possibility of a central administrator that would cause all requirements to be met for multiple solar developers operating in different parts of the state – this could be a task for CALSSA, CSSA or SEIA for example – that could occur without change to the regulations	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238396&DocumentContentId=71696
238397.001	Alfred Sattler	To reduce Greenhouse gas emissions, both methane and CO2, please have full building electrification in the 2022 Energy Code. Buildings are difficult to retrofit, so if they are built to use natural gas, they will probably be using natural gas for the lifetime of the building. The grid is using more renewable energy each year, and thus less fossil fuel. Buildings can also self-generate electricity using rooftop solar panels.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238397&DocumentContentId=71695
238398.001	New Buildings Institute	1. Electric-Ready: With an increasingly renewable energy grid, electrification both reduces carbon emissions and improves the health of a building's occupants. Making new buildings electric-ready costs very little at the time of construction and will ensure that new homes fueled by gas will be able to affordably upgrade to electric appliances in the future. NBI therefore supports the electric-ready provisions for space heating, water heating, and cooking in Title 24.	Staff appreciates the comment of support.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238398&DocumentContentId=71694

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238398.002	New Buildings Institute	<p>2. Grid Integrated Buildings: Building-grid integration is critical to supporting California's decarbonization efforts. Grid integrated buildings support the reduction of fossil fuels by shifting energy use away from the times of the day when renewable energy sources are undersupplying the grid. NBI supports the proposal to allow compliance credit for thermal energy storage technologies beyond the existing chld water systems and measures to simplify and streamline requirements for demand responsive controls. NBI also supports the proposed demand responsive lighting control and demand responsive water heating requirements in Title 24. NBI, however, recommends, that the CEC revise the proposed grid connectivity requirements for water heaters which currently reference ANSI/CTA-2045-A. Grid connectivity requirements should reference ANSI/CTA-2045-B which was published in November of 2020. ANSI/CTA-2045-B is a more advanced communication interface for water heaters which allows grid operators to require water heaters to both shed demand and load up, allowing better integration with time-of-use rate structures. ANSI/CTA-2045-A only allows grid operators to require water heaters to shed demand but not load up. Therefore, water heaters utilizing this protocol cannot be integrated with time-of-use rate structures.</p>	Staff agrees with the comment and the adopted language reflected this change	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238398&DocumentContentId=71694
238399.001	Taylor Engineering	<p>Revise 1201(c)1 filtration requirements</p> <p>1. This section requires that recirculated air (as well as outdoor air) be filtered to MERV 13. I dont recall reading any research that supports this requirement given the types of spaces fallig under these sections seldom have any particle generating processed. Note that even MERV-13 on outdoor air has only weak research evidence to support it but we have all just decided it makes sense anyway for outdoor air, but not for recirculated air. Having this requirement results in exception i being added to pick up systems that cannot have filters such as active chilled beams, fan-powered convectors, etc.. But not captured in this exception are recirculating fan-coils and fan-powered mixing boxes where ductwork often exceeds 10 feet. I know of no research that supports the notion that 10â€™™1â€™ of ductwork gets dirty and creates a health risk but 10â€™™0â€™ does not. Fan-powered boxes will become more popular with electrification since they are commonly paired with electric resistance heaters and can reduce reheat energy use due to the fan providing the airflow needed for heating, and they eliminate hot water piping losses, such that electric resistance heat can be as energy efficient as central HW heat pumps. So the CEC should not discourage this system by adding onerous filtration requirements â€™ the fans on these terminal units generally cannot handle the added pressure drop of MERV 13 filters. Note that neither ASHRAE 62.1 nor LEED requires filtration of recirculated air. So this section should be rewritten to only require outdoor air filtration. That would allow exceptions and</p>	Staff finds that the decision to update prior filtration requirements specifying MERV 6 or 8 to MERV 13 was made as a part of the prior (2019) rulemaking and revision to the Energy Code; this is not proposed to be revisited as a part of the current rulemaking proceeding, additionally noting that the analysis in the prior rulemaking record found an absence of correlation between MERV rating and pressure drop in the range of MERV 6 to 13.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238398&DocumentContentId=71693

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238399.002	Taylor Engineering	2. Wherever "MERV" is referenced, it should be changed to MERV-A, i.e. require filters to be tested after being preconditioned using ASHRAE 52.2 Appendix J. There are many filters on the market, especially the inexpensive 1" and 2" filters, that meet MERV 13 by creating a static charge on the media that causes an initial efficiency of MERV 13, but the charge readily dissipates and performance typically falls well below MERV 11.	Staff finds that existing references to MERV within the Energy Code are references to MERV and not to MERV-A, and that changing requirements to specify MERV-A where MERV is currently specified would require a complete code change proposal so that the costs and benefits of doing so can be considered and disclosed to the public. Staff therefore invites the commenter to submit a complete code change proposal relating to use of MERV-A in place of MERV for the next regular rulemaking proceeding.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238399&DocumentContentId=71693
238399.003	Taylor Engineering	3. AHRI Standard 680 applies only to residential equipment. This section applies to commercial buildings. So that standard should be deleted "only include MERV-A per ASHRAE 52.2.	Staff finds that existing references to MERV within the Energy Code are references to MERV and not to MERV-A, and that changing requirements to specify MERV-A where MERV is currently specified would require a complete code change proposal so that the costs and benefits of doing so can be considered and disclosed to the public. Staff therefore invites the commenter to submit a complete code change proposal relating to use of MERV-A in place of MERV for the next regular rulemaking proceeding.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238399&DocumentContentId=71693
238399.004	Taylor Engineering	4. Item C.i. should say "Filters with a nominal depth of 2 inches or more." Certainly there is no intent to outlaw deeper filters	Staff finds that the language specifies a "nominal two inch <i>minimum</i> depth filter", meaning a minimum nominal depth of two inches - the language already has the effect requested by the commenter, as it does not outlaw deeper filters.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238399&DocumentContentId=71693
238400.001	California Energy Alliance	Section 10-103(a)4B a. We want to thank the Energy Commission for including the proposal recommendation from CEA found in Docket 19-BSTD-03, TN#232808, 4/21/2020 CEA Data Registry and Repository Comments. However, the added language found in Section 10-103(a)4B requires clarification. CEA supports a number of the ATTCPs in their request for clarification regarding the following language in this section: "excluding all Certificates of Acceptance recorded by an acceptance test technician provider (10- 103.1 and 10-103.2)." Can the Energy Commission please clarify the direction and intent of this language?	This language has been added in the 15-day language sections 10-103 and 10-109 and JA7.4.8. It precludes the "double registration" of NRCA forms with both the ATTCP and the NDR (if one is approved by the CEC).	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238400&DocumentContentId=71693
238400.002	California Energy Alliance	Sections 10-103.1(c)3. H. v. and 10-103.2(c)3. H. v. a. Again, CEA would like to thank the Energy Commission for incorporating and updating language in these two sections in alignment with previous CEA comments. However, the 2022 Express Terms state "The Energy Commission 'may' adopt an Application Programming Interface (API)..." The CEA recommends the Energy Commission change the language from "may" to "will". As the central hub, the Energy Commission will need to develop the API. This will allow for consistency across all ATTCPs uploading data and documents to the CCDR.	Thank you for your comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238400&DocumentContentId=71693

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238400.003	California Energy Alliance	<p>3. Language put forth in Section 110.12 – Mandatory Requirements for Demand Management, (c) – Demand Responsive Lighting Controls. We are aligned with the comments submitted by many CEA Members regarding the language of "nonresidential lighting systems...with a general lighting power of 4,000 W or more" to be modified to:</p> <p>a. Demand Responsive Lighting Controls. Demand responsive lighting controls shall be required in buildings Nonresidential lighting systems subject to the requirements of Section 130.1(b) and with a general lighting power total connected lighting load of 4,000 watts or greater shall have controls that are. Lighting controls in nonresidential buildings larger than 10,000 square feet shall be capable of automatically reducing lighting power in response to a Demand Response Signal. General lighting shall be reduced in a manner consistent with the uniform level of illumination requirements in TABLE 130.1-A.</p> <p>b. Limiting the requirement to general lighting significantly reduces the impact of demand responsive controls in many applications that use other systems for their day-to-day lighting needs. This includes applications like retail and hospitality, which rely on a variety of lighting types to illuminate the space. The total connected lighting load, with minimal exceptions, is the only way to ensure energy savings from this measure.</p>	Note that draft language is included in the comment. Revisions were made to Section 110.12 for clarification. The lighting power threshold is based on lighting applicable to Section 130.1(b) which is based on general lighting power. It was determined that general lighting alone would be able to reduce the lighting power of the space by 15% whereas other lighting categories may not be able to do so. It should be noted that reducing other lighting categories through demand controls can be used when reducing lighting power by 15% during demand response.		45-Day	
238400.004	California Energy Alliance	<p>Section 110.12 – Mandatory Requirements for Demand Management</p> <p>a. We want to thank the Energy Commission for all the work done to include this new section, which was supported by the proposal recommendations CEA submitted in June 2020. This measure proposal added the new Section 110.12(e) Demand Responsive Controlled Receptacles and modified Sections 130.4 and 130.5.</p>	Thank you for the support.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?DocID=238400
238400.005	California Energy Alliance	<p>Section 130.1(a) - Manual Area Controls</p> <p>a. Section 130.1(a)3 has been updated and CEA supports this change to clarify how a lighting scene controller can be used for compliance. As this clarification is clearer for lighting designers, CEA requests that this new explanatory language be retroactive to the Title 24 2019 language.</p>	<p>Staff appreciates the support.</p> <p>The second part of the comment about requesting the new code to be retroactive to 2019 Energy Code is outside the scope of this rulemaking proceeding and therefore it is outside of this response scope/log.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?DocID=238400
238400.006	California Energy Alliance	<p>Section 130.1(c)1 Exemption 6</p> <p>a. CEA opposes the new and revised exemptions to lighting controls that include eliminating controls for stairwells designated for means of egress. This would be a major roll back in stringency that will increase energy use.</p>	Exemption 6 to Section 130.1(c)1 was deleted in the 15-Day Language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?DocID=238400
238400.007	California Energy Alliance	<p>Section 130.2(c)3 Exemption 4</p> <p>a. CEA opposes the new and revised exemptions to lighting controls changing the outdoor occupancy-based controls requirement threshold from 40 to 78 watts. We believe this was done to align with ASHRAE 90.1, however, we feel this will be a roll back in stringency that will increase energy use.</p>	Exemption 4 to Section 130.2(c)3 was deleted in the 15-Day Language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?DocID=238400

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238400.008	California Energy Alliance	<p>Opposition to and general comments on Multifamily Building Requirements:</p> <p>a. The CEA aims to develop and advocate for measure proposals for building energy code improvements that will deliver energy savings, reduce costs, increase code compliance, and move California closer to its energy and environmental goals. We feel the addition of 130+ new pages being added to the energy code regarding multifamily buildings only creates more complexity and repetition. This increasing complexity translates into more significant challenges understanding and implementing the code which will surely reduce code compliance. As noted by many CEA Members, there are discrepancies between information in the proposed new section and other parts of the code from which it has been assembled. This is due in part to the combining of certain language from nonresidential sections with residential sections.</p> <p>b. We recognize and appreciate all the work the Energy Commission has completed to create this multifamily section, but the CEA requests this new multifamily language be removed or refer to previous code sections where applicable and clearly call out the new sections. This will allow CEA and its Members to thoroughly review the changes and support in educating energy stakeholders on these updates to ensure code compliance.</p>	<p>Staff does not find that consolidating multifamily requirements into dedicated multifamily chapters to increase complexity - staff finds that this is likely to decrease the difficulty in understanding the requirements given that they are not interspersed between residential and nonresidential requirements nor spread out across as many chapters of the Energy Code.</p> <p>Staff notes that descriptions of substantive effects of the amendments are found in the Initial Statement of Reasons for the proposed changes.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?DocID=238400
238401	Sacramento Engineering Consultants	<p>Tailored is no longer needed. Before LED light fixtures have become the mainstream I used the tailored method quite a bit. A decade ago the only way you could get a retail store with lots of spot and track lighting to comply was to use Tailored. But gone are the days of 150 watt Metal Halide spot lights, replaced with 10 watt LEDs. It would be much better suited to give more Additional Allowance credits than continue to support Tailored as an antiquated methodology. There is also a fundamental difference between PAFs and Tailored - PAFs are do-something above-and-beyond what is required in terms of more advanced controls to get a small bonus, while Tailored is perform a more complicated and time intensive compliance method for the possibility of increased allowance.</p>	<p>Thank you for the comment that tailored method is no longer needed. It is good to hear that retail store lighting can be achieved nowadays without using tailored method, and that it is preferable to have additional lighting power allowance (credits) for the retail store lighting. Since there is no discussion or proposal about the value of keeping or not keeping the Tailored method, the Commission could not simply to remove it based on one comment suggestion. It would be more appropriate to evaluate and discuss this item in future Code Cycle (for 2025 Code), noting that use of the tailored method is elective on the part of the designer / builder. Staff would welcome a proposed change in the 2025 code cycle.</p>	7/19/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?DocID=238401&DocumentContentId=238931
238401.001	Lucas Morton/CABEC	<p>JUNIOR ACCESSORY DWELLING UNIT, JUNIOR ACCESSORY , or JADU is a dwelling unit that is no more than 500 square feet in size and contained entirely within an existing single family building.</p> <p>This definition conflicts with HCD definitions and many local designations. There is nothing generally to say that a JADU is created and contained entirely within an existing single-family building. We recommend that you match the current HCD definition of JADU. According to HCD website: https://www.hcd.ca.gov/policy-research/accessorydwellingunits.shtml#newlaws "Junior Accessory Dwelling Units (JADUs) are allowed to be created within the walls of a proposed or existing single-family residence and shall contain no more than 500 square feet. Also see Gov. Code, § 65852.2</p>	<p>Per your reference to Gov. Code 65852.2, this redirects to 65852.22 (junior accessory dwelling units). The definition found in this referenced section aligns with what you have identified in the Energy Code. This definition identifies JADUs, which are a very specific type of ADU, and interact differently with the primary dwelling unit, specifically with regards to mechanical ventilation requirements.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?DocID=238401&DocumentContentId=21702

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238401.002	Lucas Morton/CABEC	<p>SINGLE FAMILY RESIDENCE BUILDING is any of the following:</p> <ul style="list-style-type: none"> o A residential building of Occupancy Group R-3 with two or less dwelling units, o A building of Occupancy Group R-3, other than a multifamily building or hotel/motel building, o A townhouse, o A building of Occupancy Group R-3.1, or o A building of Occupancy Group U when located on a residential site. <p>Clarify distinction between R-3 with two or less and the general R-3 other than multifamily or hotel/motel. It seems the second definition eats the first. Also, clarify what you mean by 'residential site' for Occupancy Group U. Does this mean that a Group U building on a high-rise residential site is a now considered a single-family residence building? Also-- consider the received grammar rule and change 'two or less' to 'two or fewer' as dwelling units are a discrete counted quantity.</p>	We appreciate the feedback. The language accurately aligns with other parts of Title 24. Staff will consider clarifying regulatory language in the 2025 code update.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238401&DocumentContentId=71202
238401.003	Lucas Morton/CABEC	<p>CERTIFICATION AND LABELING OF FENESTRATION PRODUCT AND EXTERIOR DOOR U-FACTORS, SOLAR HEAT GAIN COEFFICIENTS, VISIBLE TRANSMITTANCE AND AIR LEAKAGE</p> <p>We encourage the Commission to consider expanding this include thermal performance of glazing using international standards: ISO 10077, CEN - EN 673, and DIN EN ISO 12631. There are many high performance glazing systems (typically European) that have excellent thermal performance and would greatly benefit the efficiency of buildings, but do not have the wherewithal or desire to invest in NFRC testing. It is a shame to discourage projects from using these high performance products in favor of lower performance with requisite NFRC 100 and 200 performance data.</p>	Staff notes that the rulemaking record does not include any information about the costs or benefits of allowing use of these standards, nor of their comparability to existing standards or the potential need to adopt parallel efficiency standards based on the differing numerical descriptors each test produces. Staff therefore does not find that adopting or specifying use of these procedures would be appropriate based only on the content of the comment - staff invites the commenter to submit a complete code change proposal (inclusive of all necessary analyses) for the next regular rulemaking proceeding.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238401&DocumentContentId=71202
238401.004	Lucas Morton/CABEC	<p>...may be used as a compliance option to partially or totally meet the on-site solar electric generation system and/or battery storage system that is otherwise required by Section 140.1(b), 150.1(b)1, or 170.1(b) of Title 24, California Code of Regulations, Part 6... [emphasis added]</p> <p>The language states that Community Solar only applies to the Performance path. Is the intent to really exclude Prescriptive compliance here? I don't see a reason why Community Solar could not reasonably meet the PV requirements that are indicated in the Prescriptive pathway.</p>	The intent of community solar is to apply to performance compliance path only. The community solar share needed for compliance is a complex calculation that is different for each project. It is much more appropriate for performance compliance only	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238401&DocumentContentId=71202
238401.005	Lucas Morton/CABEC	<p>10-115(a)3</p> <p>is otherwise required by Section 150.1 of Title 24 . The energy savings benefits allocated to the building shall be in the form of:</p> <p>Update the code references to include non-res and multifamily</p>	Staff agrees and the adopted language includes references to the multifamily and nonres sections	6/21/2021	45-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238401&DocumentContentId=71202

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238401.006	Lucas Morton/CABEC	"Heat Pump" and "Heat Pump Water Heater" are defined, but are defined to exclude a number of other purposes and capabilities. Given the importance of heat pump technology in future code cycles, we believe it's important to invest in a more thorough ontology of heat pump technology. For example-- heat pump could be defined as a machine with general reversible refrigeration cycle (vapor compression, ad/absorption, etc.), with subclasses of 'air-to-air heat pump', 'air-to-water heat pump', 'heat pump water heater', etc.	Thank you for the comment and staff will consider update of heat pump definition in the 2025 code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238401&DocumentContentId=71702
238401.007	Lucas Morton/CABEC	DUCTED and NONDUCTED SYSTEMS The definition provided is arbitrarily constrained to air conditioning and heat pumps. To wit--there are also ducted furnaces, and nonducted floor heaters, wall furnaces, and baseboard electric heaters. For non-ducted heat pumps, the term 'nonducted' is not in common use for this kind of system anyway, rather the term 'ductless' is used in the industry and in the ACM/software. Consider refining the definitions to capture more common sense use, and also adding 'ductless' as a defined term.	Staff notes the comment for possible revision in the next code cycle. The terms "ducted system" and "nonducted systems" is used in context with only air conditioners and heat pumps in the Standards. The term "nonducted" is consistent with AHRI terminology. "Nonducted" and "ductless" should be understood to mean the same thing.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238401&DocumentContentId=71702
238401.008	Lucas Morton/CABEC	MANDATORY REQUIREMENTS FOR INSULATION, ROOFING PRODUCTS AND RADIANT BARRIERS The Exception is specifically edited to only apply to single-family homes. However, don't the attic ventilation requirements from CRC 806 and CBC 1202.2 also apply to all low-rise buildings? This exception is important as it allows contractors to add insulation into uninsulated and poorly insulation buildings with minimal attic and rafter depth while maintaining venting. Without this exception, contractors may be incentivized to not add any insulation, thus squandering a substantial efficiency opportunity. We suggest that you maintain the applicability to 'low-rise residential' and not just 'single-family'	Staff added language to act as a pointer to the parallel requirement in the multifamily chapters (180.2) consistent with the commenter's comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238401&DocumentContentId=71702
238401.009	Lucas Morton/CABEC	PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES Code now requires construction documents include "air barrier boundaries, interconnections and penetrations, and associated square foot calculations for all sides of the air barrier." We believe this is a good and helpful requirement and we encourage the Compliance Manual and Education team to provide examples to educate plans examiners and design professionals alike in how to satisfy this requirement.	Staff appreciates the comment of support.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238401&DocumentContentId=71702
238401.01	Lucas Morton/CABEC	Ceiling and Rafter Roof Insulation We suggest that you broaden exception to include other duct locations than just the conditioned space. E.G. if ducts and AHU are in crawlspace, we question the cost-effectiveness of HPA insulation. Consider revising to "No roof deck insulation is required when there are no ducts or air handler in the attic.	Staff notes that the energy benefits of preventing the attic space from acting as a solar concentrator are significant even in the absence of ducts within that attic space. Staff therefore does not find that expanding the scope of the exception in the manner suggested by the commenter would be appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238401&DocumentContentId=71702
238401.011	Lucas Morton/CABEC	EXCEPTION to Section 150.0(k)1Cii and iii: Thank you. This is a welcome exception.	Staff appreciates he support for the residential recessed downlight luminaires language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238401&DocumentContentId=71702

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238401.012	Lucas Morton/CABEC	150.0(k)2Ei Automatic Off Controls Please define walk-in closets. Or is this a Potter Stewart test (i.e. you know it when you see it)?	Staff disagrees that there is a further need to define walk-in closets. Walk-in closets are closets that can allow a person to walk in as it is commonly understood.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238401&DocumentContentId=71702
238401.013	Lucas Morton/CABEC	150.0(k)5 Residential Garages for Eight or More Vehicles This element seems a remnant of Multifamily. The nonresidential lighting requirements are more appropriate for garages that are shared among multiple tenants and/or dwelling units, and seem inappropriate for single-family residences with generally 3 or fewer dwelling units. Consider removing this.	The comment is about an existing code requirement that are applicable to residential garage with eight or more vehicles. Many single-family building do not have garages for eight vehicles or more, and these SF buildings would be required to comply this requirement. The requirement would still apply for very large single-family buildings that have garage that fits the described condition of this code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238401&DocumentContentId=71702
238401.014	Lucas Morton/CABEC	Air filtration Air filtration applies to both mechanical supply-only and makeup air systems. However, makeup air systems are not necessarily mechanically driven (as indicated in Section 100.1 definitions)--some systems are simply passive barometric relief. In the context of this requirement, filtration seems intended for mechanically driven makeup air, and we encourage this qualification be added.	Staff finds that the definition for makeup air in Section 100.1 is accurate. The air filtration requirement is applicable to makeup air per the definition.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238401&DocumentContentId=71702
238401.015	Lucas Morton/CABEC	10-115(a)4Durability and Building Opt-out "...if and only if..." This phrase seems out of place in code language as the biconditionality has no apparent meaning when there is only one articulated qualifying condition. To wit-- the 'only if' goes without saying.	This whole section was rewritten and the referenced language in the comment is not part of the adopted language	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238401&DocumentContentId=71702
238401.016	Lucas Morton/CABEC	150.0(c)5 The mandatory requirements incorporate the Prescriptive requirements by reference-- this is weird. Furthermore, why are masonry walls required to have greater insulation than light-framed metal/wood walls (in the case of interior insulation)? One would think that higher thermal capacitance in a masonry wall would benefit efficiency relative to a framed wall with equal thermal resistance. The exterior insulation approach does allow for a lower/lesser mandatory insulation, but then this typically requires significant extra costs in insulation attachment and cladding. It just seems arbitrarily punitive on masonry walls.	Staff notes that the language in question is existing language that is not proposed to be modified. Given that that there is not information in the rulemaking record that would form the basis for consideration of an alternate insulation standard for masonry walls, staff invites the commenter to submit a complete code change proposal on this topic for the next regular rulemaking proceeding.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238401&DocumentContentId=71702
238401.017	Lucas Morton/CABEC	150.0(o)1Gv.a Airflow Measurement of Local Mechanical Exhaust by The System Installer The CF2R's have not yet been issued or updated for this code cycle, but we hope that CF2R's, Reference Appendices, RCM, and supplemental trainings will help bring this ambitious requirement to greater success.	Staff appreciates and notes the comment. This comment pertains to the forms and not directed at the 2022 Standards rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238401&DocumentContentId=71702

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238401.018	Lucas Morton/CABEC	150.0(o)1H Balanced mechanical ventilation system airflow shall be the average of the supply fan and exhaust fan flows. As we understand this-- if the supply air is 200 CFM and the exhaust air is 220 CFM, then the unit is only getting 210 CFM of ventilation air? There seems to a mass imbalance here, and it is not immediately apparent why the total ventilation rate shouldn't be the greater of the two values for the purposes of satisfying total airflow requirements as this would reflect reality.	Staff finds the language is correct as-is and consistent with ASHRAE 62.2. A balanced ventilation system is a mechanical device intended to remove air from the building and simultaneously replace it with direct outdoor air (not through leakage pathways). ASHRAE 62.2 allows the supply fan flow and the exhaust fan flow to be within 20% of each other by definition. The Standards accounts for the effectiveness of balanced systems differently versus supply only or exhaust only systems.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71202
238401.019	Lucas Morton/CABEC	150.0(o)2A Balanced mechanical ventilation system airflow shall be the average of the supply fan and exhaust fan flows. Same comment as before	Staff finds the language is correct as-is and consistent with ASHRAE 62.2. A balanced ventilation system is a mechanical device intended to remove air from the building and simultaneously replace it with direct outdoor air (not through leakage pathways). ASHRAE 62.2 allows the supply fan flow and the exhaust fan flow to be within 20% of each other by definition. The Standards accounts for the effectiveness of balanced systems differently versus supply only or exhaust only systems.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71202
238401.02	Lucas Morton/CABEC	150.1(c)1A NOTE NOTE: Low rise residential single- family and multifamily buildings with the ducts and air handler located in the conditioned space, as specified by Section 150.1(c)9B, need only comply with insulation requirements of Option C Remove reference to Multifamily buildings in the NOTE	Staff has removed this language consistent with the commenter's request.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71202
238401.021	Lucas Morton/CABEC	150.1(c)1C Exception We suggest that you add a reference to R408 and R408.2 Exception	Staff does not find that the language in Section R408 of the Residential Code has a substantive effect or bearing on this Exception, and that inclusion would be likely to result in misunderstanding or misapplying the exception.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71202
238401.022	Lucas Morton/CABEC	150.2(b)1Dii If the air handler and ducts are located within a vented attic the requirements of Section 150.2(b)1J shall also be met We are ambivalent about this addition. On the good side, in spite of some obvious pitfalls in compliance and enforcement, we support this section as a beneficial policy ratchet for project types that are difficult to incentivize efficiency. On the downside, this will frustrate many and incentivize non-permitted work.	Staff appreciates and notes the comment. The reasoning for this as provided in the CASE report was that replacing a whole duct system is disruptive to existing attic insulation and oftentimes the attic insulation is not fixed after the completion of the duct replacement.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71202
238401.023	Lucas Morton/CABEC	150.0(s)2 "A minimum of four branch circuits shall be identified and have their source of supply collocated at a single panelboard suitable to be supplied by the ESS...." Consider saying "co-located" instead of "collocated". We believe that's what was intended and the hyphenation will read better.	We relied on language provided by CALSSA working group. Collocated can be one word or hyphenated. No change needed.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71202

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238401.024	Lucas Morton/CABEC	150.1(c) and EXCEPTION 6 to Section 150.2(a) Additions 1,000 square feet or less are exempt from the Ventilation Cooling requirements of Section 150.1(c)12 his exemption should apply to new construction as well as additions. Typical ventilation cooling fans are too large to fit into typical attic spaces in smaller building geometries.	The 15-day language adds an exception to 150.1(c)12 for small newly constructed buildings. The applicability to new construction and additions is not the same.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238401&DocumentContentId=71702
238401.025	Lucas Morton/CABEC	150.1(c) and 150.2(a)1Aii The maximum allowed fenestration area shall be the greater of 175 square feet or 20 percent of the addition floor area, and the maximum allowed west-facing fenestration area shall be the greater of 70 square feet or the requirements of Section 150.1(c). Minimum baseline allowances for glazing (175 sq.ft.) and West-facing glazing should be extended to new construction	Staff has reviewed this comment, but feel that this is outside the scope of this Rulemaking and therefore not something we could entertain at this time. Staff welcomes a proposal for the 2025 energy code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238401&DocumentContentId=71702
238401.026	Lucas Morton/CABEC	150.1(c) and 150.2(a)1B Additions that are 700 square feet or less shall meet the requirements of Section 150.1(c), with the following modifications: Allowances for non-HPA, requirement of radiant barrier, and minimum allowances for Total and West-facing glazing (120 and 60 sq.ft., respectively) should be extended to new construction less than 700 sq.ft. and greater than 400 sq.ft. The same difficulties in applying roofline insulation while maintaining proper attic venting, HVAC unit access (per CBC and CRC) and running ductwork apply.	Staff has reviewed this comment, but feel that this is outside the scope of this Rulemaking and therefore not something we could entertain at this time. Staff welcomes a proposal for the 2025 energy code.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238401&DocumentContentId=71702
238401.027	Lucas Morton/CABEC	150.2(a)1Cia2 Junior Accessory Dwelling Units (JADU) that are additions to an existing building. The existing language is consistent, but you may consider adding clarifying language-- "JADU's that are or include additions to an existing building. Also-- pertinent to previous comment on the definitions in Section 100.1, the implied definition here is one that is partially precluded by the definition in section 100.1. I would reference our previous comment on that to make the definitions cleaner and more consistent. E.G. in spite of definition of JADU in section 100.1, a JADU may or may not be an addition (it could be entirely new construction), and if is an addition, then it may also include new construction elements and not include conditioning previous enclosed space.	JADUs as defined are not considered newly constructed buildings. They are contained entirely within an existing single family building, and as such, would be attached, and part of the same building. Therefore, staff determined that further clarification language was not necessary.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238401&DocumentContentId=71702

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238401.028	Lucas Morton/CABEC	<p>150.0(m)1Bii a & b</p> <p>According to the referenced documents analyzing ducts in the conditioned space, the intention of this requirement appears to be condensation control, and the authors of the study did not conclude that condensation was a particularly large issue in California. From the report: "Based on the analyses performed the authors conclude that condensation of water on duct surfaces is not likely to be a major issue for uninsulated ducts located in wall cavities in California homes." Indeed, the amount of condensation was calculated to be less than a teaspoon. The inclusion of duct insulation for ducts in conditioned space is largely indicated in best practice design, but the supporting study offers weak support for a code requirement. Furthermore, the code language itself is a bit overwrought given the realities of available materials (see next comment). Condensation control on duct systems is already covered in the mechanical code and would encourage that such language be placed there. Condensation control strategies run counter to energy efficiency in some cases, as is apparent with the counterintuitive requirement for lower insulation on higher emissivity surfaces (e.g. in a chapter of code that is generally about energy efficiency, wouldn't we expect more insulation on high emissivity surfaces?)</p> <p>As a parting thought, we acknowledge that these comments may be overwrought, as we believe that most field practice will defer to the Exceptions provided, and the code requirement is</p>	<p>The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71702</p>
238401.029	Lucas Morton/CABEC	<p>150.0(m)1Bii a & b</p> <p>Using an emissivity value to trigger meeting a or b is going to be difficult. Based on 45-day express terms hearings, ducts with a surface emissivity greater than or equal to 0.8 were referred to as sheet metal ducting. Unfortunately, emissivity ratings for this type of material is uncommon and may cause confusion for installers and inspectors. I suggest adding language to identify the intended material for ducting for a & b.</p>	<p>The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. This deletes the 45-day language that included the emissivity criteria. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71702</p>
238401.03	Lucas Morton/CABEC	<p>150.2(a)1Ai</p> <p>Extensions of existing wood-framed walls may retain the dimensions of the existing walls and shall install cavity insulation of R-15 in a 2x4 framing and R-21 in a 2x6 framing.</p> <p>This allowance for wall extensions should also apply to Alterations –150.2(b). Consider the case of not just an addition, but also a 'subtraction' of conditioned space where newly constructed walls are being built in the same plane as an existing wall. We believe it is reasonable that this same exception apply here for newly built walls in existing spaces, but there is currently no allowance for it in the code.</p>	<p>Staff notes that all alteration requirements are prefaced as applying to the "altered components". To the extent that an alteration of a wall leaves some portion of the wall unaltered, that portion is not subject to requirements, making an exception similar to the exception for additions unnecessary.</p> <p>To the extent that an alteration project does fully alter a wall (e.g., removing all studs and other elements), then the code is intentional in expecting the replacement to now be able to comply with current code requirements (as there are no longer any limiting elements).</p> <p>Staff therefore does not find that the addition of the exception suggested by the commenter would be appropriate.</p>	6/21/2021	45-Day	<p>https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384018.DocumentContentId=71702</p>

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238401.031	Lucas Morton/CABEC	<p>150.2(b)1G</p> <p>Altered or Replacement space-heating systems shall comply with Section 150.1(c)6.</p> <p>If I'm following this correctly, then a furnace that breaks down in Santa Rosa can be replaced with a new furnace, but if it breaks in San Francisco, then there is no Prescriptive compliance option to replace that unit. More generally, prescriptive replacement space heating systems in CZ's 3,4,10,13,14 must be heat pumps. While this requirement may be facially appealing to decarbonization advocacy, it may ultimately prove to be counterproductive as this will be a significant disincentive to pull a permit.</p> <p>During the hearings, CEC Staff mentioned that replacement equipment could be of the same fuel type, but this is not consistent with the language. We note that the language in section 150.2(b)1H for Prescriptive Water heating alterations/replacements is fuel neutral.</p>	<p>This section referenced the heat pump baseline requirements unintentionally. The 2022 heat pump baseline requirements do not apply to additions and alterations. This language was corrected in the 15-day draft. The intention of 150.2(b)1G is to prohibit electric resistance heating under certain conditions, not gas heating systems.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238401&DocumentContentId=71702
238401.032	Lucas Morton/CABEC	<p>160.1(b)</p> <p>Wall insulation requirements</p> <p>Mandatory requirements in subsection (b) describe insulation requirements for all walls separating conditioned space and unconditioned space or ambient. Then subsection 7 includes more specific requirements for demising walls. We would encourage restructuring so the code and more stringent requirements for demising walls in those subcategories are included in the assembly categories. Specifically- we encourage you to include a demising wall category under wood-framed walls instead of describing demising walls in the same ontological level as wood-framed walls.</p>	<p>This is not part of the scope of this rulemaking. Staff will consider this change for the 2025 cycle</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238401&DocumentContentId=71702
238401.033	Lucas Morton/CABEC	<p>160.1(c)</p> <p>EXCEPTION to Section 160.1(c)</p> <p>Please cross-reference CRC and CBC sections pertinent to this section.</p>	<p>Thank you for the suggestion.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238401&DocumentContentId=71702

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238401.034	Lucas Morton/CABEC	<p>150.0(o)1Kii and 160.2(b)2Ax</p> <p>Atmospherically vented or solid fuel burning appliances shall not be installed inside the pressure boundary in dwelling units with conditioned floor area less than 1,000 ft.</p> <p>EPA 2020 wood stove requirements have effectively precluded combustion air be brought from the outside, as the introduction cold winter ambient air will disrupt the kinetics of combustion and result in higher particulate emissions. This means that clean burning wood stoves and similar solid-fuel burning appliances are effectively required to be inside the pressure boundary (whereas with a sealed combustion with dedicated outside air, they didn't used to be), and so the effect of this regulation is to make efficient and federally compliant wood-stoves illegal. This is unfortunate and unnecessary, especially for rural and/or off-grid projects.</p> <p>If we speculate on the intent of this prohibition in the context, it is to prevent poor operation and smoke spillage into a depressurized home. However, the designation of 1000 sq.ft is arbitrary and is neither necessary nor sufficient for the proper and safe operation of both IAQ ventilation as well as solid fuel burning space heating. We encourage a more carefully crafted code which allows for reasonable operation of both systems concurrently.</p>	This language has been deleted in the 15-day draft.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238401&DocumentContentId=71202
238402.001	Tom Phillips	The extensive work of CEC staff to address various issues and include carbon emission metrics in updating the Title 24 building standards is greatly appreciated. However, for the sake of due diligence and public and worker health and safety, building standards must be developed with full consideration of ongoing climate change, and significant non-energy benefits on climate change adaptation on Human Health and Productivity should be considered. The recommended approaches and examples to address the climate change risks for overheating and increased energy costs, GHG emissions, and peak power demands were summarized in my pre-rulemaking comments on Feb. 11, 2021.	Staff notes that while consideration of direct monetary costs and benefits to the consumer are an express criteria for the adoption of building energy efficiency standards under the Warren Alquist Act, staff can and do assess additional benefits resulting from proposed regulations, including those noted in the Environmental Impact Report for the project.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238402&DocumentContentId=71203
238402.002	Tom Phillips	In short, we cannot afford to lock in maladapted building design and to reduce GHG emissions by waiting to address these issues. Even if CEC lacks staffing and funding to address these issues adequately, it can at least provide guidance for builders and designers who can address these issues now -- by including guidance in CalGreen, in the Title 24 Manuals, and in collaborations with state building and other sustainability programs. If we fail to plan, we will plan to fail (Ben Franklin).	Staff considered the commenter's suggestion regarding a GHG-based prohibition on natural gas and chose not to accept the suggestion because it was outside the scope of this rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238402&DocumentContentId=71203
238402.003	Tom Phillips	Other major institutions have recently prioritized the urgent need to address overheating, peak demand reduction, and carbon emissions now (IEA, 2021; UK Committee on Climate Change, 2021, Independent Assessment of UK Climate Risk). California should follow their example.	Staff considered the commenter's suggestion regarding a GHG-based prohibition on natural gas and chose not to accept the suggestion because it was outside the scope of this rulemaking.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238402&DocumentContentId=71203

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238402.004	Tom Phillips	<p>In addition, please consider the additional information below in developing and assessing the costs and benefits climate adaptation in the 2022 Title 24 standards, and in developing guidance to mitigate the health, safety, grid, and climate impacts.</p> <p>1. Modeling study of US health risks from overheated buildings during power outages. Stone et al., April 2021. Compound Climate and Infrastructure Events: How Electrical Grid Failure Alters Heat Wave Risk. Environ Sci Technol 2021 Apr 30. doi: 10.1021/acs.est.1c00024. Online ahead of print. https://pubmed.ncbi.nlm.nih.gov/33930272/ “...Study results find simulated compound heat wave and grid failure events of recent intensity and duration to expose between 68 and 100% of the urban population to an elevated risk of heat exhaustion and/or heat stroke.”</p> <p>Comment: Under conservative climate projections (RCP 4.5), Phoenix homes had indoor temperatures averaging about 37-42 C for SFam and MFam over 5 days. Much of inland California will experience climate similar to that of present day Phoenix by mid century, based on Cal-Adapt RCP 8.5 projections.</p>	Staff appreciates the additional information submitted into the proceeding's record by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238402&DocumentContentId=71703
238402.005	Tom Phillips	<p>2. I shared the following information on the benefits & business case for climate adapted/future proof buildings with CEC staff in April 2021 via email, and with DGS Sustainability staff who are updating the State building Climate Resilience policy.</p> <p>RDH, 2019. Designing Climate Resilient Multifamily Buildings. Prepared for U. of British Columbia. Analyses of several types of MFam in BC under future climate conditions. Includes recommendations for mitigating overheating, by building type. Caveat: the ASHRAE 55 Thermal Comfort standard and its 80% acceptability limit for thermal comfort was used as benchmark, but this is not appropriate for residential settings, schools, care facilities, etc. and is not very health-protective.</p> <p>ASBEC & Climate Works Australia, 2018 (AU). Final Report. Built to Perform: An industry led pathway to a zero carbon ready building code. https://www.monash.edu/_data/assets/pdf_file/0011/1602758/180703_asbec_cwa_built_to_perform_-_zero_carbon_ready_building_code_-_web.pdf. The report outlines a set of energy performance targets for different building types across different climates, based on societal cost-benefit analysis of energy efficiency and on-site renewable energy opportunities. The goal of the analysis is to assess the contribution that the Code could make towards achieving GHG emissions reductions in line with overarching</p>	Staff appreciates the additional information submitted into the proceeding's record by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?ei=238402&DocumentContentId=71703

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238402.006	Tom Phillips	<p>4. I also shared this info re: guidelines and standards for building overheating in other jurisdictions</p> <p>BC Housing, 2019. Overheating and AQ Design Guidelines Supplement. BC Energy Step Code Design Guide & Supplemental. Summary at Builder Insight 19: Modelling the Future Climate for Passive Cooled Buildings.</p> <p>RCP 8.5 climate scenario is recommended. Morphed future weather files have their limitations, but "...using the weather files described in this Builder Insight is a good first step toward improving building resilience..."</p> <p>Note: Based on recent discussions at weekly Passive House Accelerator webinars, many designers have already run into overheating problems in new Canadian & US homes, mainly due to poorly controlled solar heat gain. Some are starting to use lower SHGC windows and solar window films, and better external shading. Almost all are using HSPHs so they can do some mechanical cooling too and still meet or approach Passive House energy, carbon, and thermal comfort standards. Some are doing overheating assessments, with future weather files.</p> <p>Toronto Atmospheric Fund, TowerWise project: various case studies and IEQ & overheating studies of deep MFam retrofits, by Touche & Siegel at U. Toronto. Future overheating impacts were assessed. 10 buildings completed so far.</p>	Staff appreciates the additional information submitted into the proceeding's record by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384026.DocumentContentId=71203
238402.007	Tom Phillips	<p>5. Recent Harvard modeling study of energy and non-energy benefits SFam retrofits in 10 US cities under current climate.</p> <p>Williams et al. 2020. Health and Climate Benefits of Heat Adaptation Strategies in Single-Family Residential Buildings</p> <ul style="list-style-type: none"> • October 2020 • Frontiers in Sustainable Cities 2(47):561828 • DOI: 10.3389/frsc.2020.561828 <p>"... Under light and deep retrofit scenarios, respectively, we estimate that the simulated heat adaptation retrofits in this subset of relatively new buildings have the potential to yield \$1.10 or \$1.57 billion in direct utilities savings. There is an additional \$462.9 million (\$301.3–\$909.9 million) or \$692.8 million (\$442.6 million–\$1.385 billion) in climate and health benefits, due to avoided GHG and AP emissions. Put simply, the climate and health benefits may account for an additional 42–44% of the direct utility savings, on average. Climate and health benefits were generally highest for adaptations simulated in hot climates (Dallas, TX and Houston, TX) or in areas with dirtier fuel mixes (Chicago, IL and Philadelphia, PA). When climate and health savings are included, the payback periods of these interventions can decrease by nearly half. We also discuss the potential additional health benefits of reducing indoor temperatures during extreme heat. These significant savings from avoided climate and public health damages should be factored into climate change adaptation decision making by</p>	Staff appreciates the additional information submitted into the proceeding's record by the commenter.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=2384028.DocumentContentId=71203

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238404.001	Statewide Utility Codes and Standards Enhancement Team	100.1 Include definitions of conditioned greenhouse from CASE Report detailing the thresholds of 10 Btu/hr/sf for heating energy and 5 Btu/hr/sf cooling energy in the definitions. This was included in the CASE team proposal but not included in the 45 Day Language The "Greenhouse, Conditioned" definition makes it clear that the envelope requirements only apply to fully conditioned greenhouses as opposed to seasonal or tempered greenhouses used for other horticulture types.	This change was implemented.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.002	Statewide Utility Codes and Standards Enhancement Team	120.1 Table 120.1-A Table 120.1-A refers to footnotes G and H but the footnotes stop at F. Incorrect reference	Revisions made to Table 120.1-A.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.004	Statewide Utility Codes and Standards Enhancement Team	Exception to Section 150.1(a)1 Change EXCEPTION to Section 150.0(a)1 to something like "No roof deck insulation is required when no duct work is located in the attic." The language in Exception to Section 150.1(a)1 only indicates that no roof deck insulation is required when the ducts and air handler are located in conditioned space. This is not consistent with information provided during 45- day express terms hearings. Based on CEC staff (hearing on 5/27/2021), the intent of this exception applies whenever ducts are NOT located in an attic, or when a ductless system is used.	Staff has revised the wording of the exception consistent with the commenter's comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.005	Statewide Utility Codes and Standards Enhancement Team	150.0(m)1Bii a & b I suggest adding language to identify the intended material for ducting for a & b. Using an emissivity value to trigger meeting a or b is problematic for compliance. Based on 45- day express terms hearings, ducts with a surface emissivity greater than or equal to 0.8 were referred to as sheet metal ducting. Unfortunately, emissivity ratings for this type of material is uncommon and may cause confusion for installers and inspectors.	The proposed 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which addresses this comment. This deletes the 45-day language that included the emissivity criteria. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/21/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238404&DocumentContentId=71705

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238404.006	Statewide Utility Codes and Standards Enhancement Team	<p>Section 150.0(s)2</p> <p>Change the term "collocated" to something that's more commonly used to describe how the circuits are intended to be placed to avoid confusion</p> <p>Section 150.0(s)2 uses the term "collocated" as it pertains to the four ESS branch circuits being identified at a single panel board. Based on the definition of "collocate", I assume this is referring to the branch circuits being "place side by side or in a particular relation" (definition). If so, I think the use of this term is confusing. I would suggest using language that's more commonly used to describe how the circuits are intended to be placed. Possibly use something like "terminate" as in "...shall be identified and have their source of supply terminate at a single panelboard"</p>	The regulatory language was suggested by stakeholders from the CALSSA working group. Collocated can be one word or hyphenated. No change needed.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.007	Statewide Utility Codes and Standards Enhancement Team	<p>150.1(c)1Aii</p> <p>Consider providing an exception for JADUs to the high-performance attic prescriptive requirement and instead require reasonable ceiling-only insulation.</p> <p>JADUs with smaller footprints, attics have much less vertical clearance than a typical singlefamily dwelling. This makes high-performance attic measures more difficult to install correctly, including below-roof-deck batt insulation and low and high attic vents and baffles. I recommend providing an exception for JADUs to the highperformance attic prescriptive requirement and instead require reasonable ceiling-only insulation.</p>	Staff has reviewed this comment, but feel that this is outside the scope of this Rulemaking and therefore not something we could entertain at this time.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.008	Statewide Utility Codes and Standards Enhancement Team	<p>150.1(c)3</p> <p>consider allowing a higher glazing percentage for JADUs and ADUs</p> <p>Since other concessions for JADUs have been introduced into Section 150.1, consider allowing a higher glazing percentage for JADUs which could allow a 30% glazing for JADUs (≤ 500 ft²) and possibly a 25% glazing for ADUs >500 ft² and ≤ 700 ft².</p>	Staff has reviewed this comment, but feel that this is outside the scope of this Rulemaking and therefore not something we could entertain at this time.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.009	Statewide Utility Codes and Standards Enhancement Team	<p>150.2(b)1G</p> <p>I suggest changing the language in Section 150.2(b)1G to be consistent with information provided during the CEC hearing, something similar to what's in the 2019 Energy Code: "Replacement space-heating systems shall be limited to natural gas, liquefied petroleum gas, or the existing fuel type." "EXCEPTION to Section 150.2(b)1G: When the fuel type of the replaced heating system was natural gas or liquefied petroleum gas, the replacement spaceconditioning system may be a heat pump"</p> <p>Section 150.2(b)1G indicates Altered spaceheating systems shall comply with Section 150.1(c)6, which refers to Table 150.1-A and requires a gas furnace to be replaced with a heat pump in CZ 3, 4, 10, 13 and 14. Based on the CEC hearing, this is not the CECs intention for altered space-heating systems.</p>	<p>This section referenced the heat pump baseline requirements unintentionally. The 2022 heat pump baseline requirements do not apply to additions and alterations. This language was corrected in the 15-day draft. The intention of 150.2(b)1G is to prohibit electric resistance heating under certain conditions, not gas heating systems.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205

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238404.01	Statewide Utility Codes and Standards Enhancement Team	<p>100.1, 160, 170, 180</p> <p>100.1 COMMON ... Definitions, use of new terms throughout 160, 170, 180 need to be revised to "dwelling unit" and "common use area" only, and these 2 new definitions removed</p> <p>The addition of the new definitions to describe dwelling units spaces "common living area" in which habitable spaces are included, but then the new definition for common areas "common service areas" which includes the word nonhabitable, will cause confusion throughout the industry in understanding the intent of these new definitions to their application of code to particular spaces. Please keep to "dwelling unit" and "common use area" as is supported consistently throughout the Energy Code, and all other parts of the Building Code</p> <p>Prevent confusion of application of code requirements</p>	Staff removed the use of the terms "common living" and "common service" areas, to instead consistently use the defined term "common use" and instead rely on an exception and directly stated qualifications for when common use areas can be designed according to residential design principles. This resolves the noted confusion of terms.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71205
238404.011	Statewide Utility Codes and Standards Enhancement Team	<p>Table 100.0-A new multifamily lines</p> <p>Missing references to any 110 sections as supported in nonresidential and single family lines above need to be added</p> <p>It may be construed that these subchapter section do not apply to multifamily occupancies</p>	Staff has implemented these corrections.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71205
238404.012	Statewide Utility Codes and Standards Enhancement Team	<p>160</p> <p>Will new fan requirements of 120.10 apply to multifamily buildings? If so, this needs to be added to 160</p> <p>Missing new proposed fan requirements if intention is for them to also apply to multifamily</p> <p>support multifamily unification</p>	Staff worked with the CASE team to find that FEI application to to multifamily would not include many fans and will not be applied for this code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71205
238404.013	Statewide Utility Codes and Standards Enhancement Team	<p>45 day updates made to subchapters outside of 160 not fully captured here, is that on purpose?</p> <p>160.1(a) versus 150.0(a); 160.2(c)3 versus 120.1(c)3; 160.2©5E versus 120.1©5; 160.2©7 versus 120.1(f); 160.2©8 versus 120.1(g); Table 160.2-B versus Table 120.1-A; 160.3(a)2Diii versus 120.2(e)3; 160.3(a)Aii versus 150.0(m)1B; 160.3©2Ciid versus 120.4(b)2D; 160.3(c)2Hic versus 140.4(g)1D; 160.3(c)3 versus 120.5(a)3; 160.4(a) versus 150.0(n); 160.4(e)3 versus 120.9(c); 160.5(b)4Cie versus 130.1(c)1E; 160.5(b)4Cv versus 130.1(c)5 which I find very confusing; 160.5(b)C4Cvi versus 160.1(c)6; 160.5(b)4D exception 8 versus 130.1(d) exception 8; 160.5(e)1 versus 130.4(a); 160.5(e)2 versus 130.4(b)</p> <p>support multifamily unification</p>	Staff reviewed edits and updated language where appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71205

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238404.014	Statewide Utility Codes and Standards Enhancement Team	45 day updates made to subchapters outside of 170 not fully captured here, is that on purpose? 170.2©3Biii versus 150.1©10C; Table 170.2-B versus Table 140.4-A; 170.2©4ci versus 140.4(e)1 exceptions 6 (7 not needed); missing 140.4(k)8 high capacity space heating gas boiler systems; 170.2©4Nii differs from 140.4(p)2; Table 170.2-I and J missing notes from Table 140.4-I and H; 170.2(d)1C versus 150.1(c)8; 170.2(e)2Bix versus 140.6(a)2i; 170.2(e)2D versus 140.6(a)4B; 170.2(e)4Avg versus 140.6(c)2Gvii; Table 170.2-L versus Table 140.60A; Table 170.2-M versus Table 140.6-C including footnotes; Table 170.2-N versus Table 140.6-D support multifamily unification	Staff reviewed the suggested edits and updated language where appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.015	Statewide Utility Codes and Standards Enhancement Team	45 day updates made to subchapters outside of 180 not fully captured here, is that on purpose? 180.1 versus 141.0(a) new exceptions 5 and 6; 180.2(a) versus new 141.0(b)1D; 180.2(b)1Bii versus 141.0(b)2Bii; 180.2(b)1Ai versus 141.0(b)2Bii (recoat clean up); 180.2(a) versus 141.0(b)D(new); 180.2(b)2Ai versus 141.0(b)2C; 180.2(b)2Aii versus 141.0(b)2D; 180.2(b)2Aiiial versus 150.2(b)1Diia; 180.2(b)2Aiiial versus 150.2(b)2Diib; 180.2(b)2Aii versus 150.2(b)1E; 180.2(b)2BiiicII versus 141.0(b)2Dii; 180.2(b)2Bii versus 141.0(c)2Diii; 180.2(b)2Biii versus 141.0(b)2E; 180.2(b)4Biv versus 141.0(b)2i; 180.2(b)4Bvb and c versus 141.0(b)2Lii and iii; 180.2(b)4Bviid versus 141.0(b)2PIV support multifamily unification	Staff reviewed the suggested edits and updated language where appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.016	Statewide Utility Codes and Standards Enhancement Team	All of JA New multifamily subchapter references not included RA3.1.4.7(c); RA3.1.4.8(c) and (d); RA3.2.2; RA3.2.2.3; RA3.2.3; RA3.3.4/.1/.2; RA3.4.4.3 including (c); RA3.5.1; RA3.5.3; RA3.5.4; RA3.5.5; RA3.6.2; RA3.6.6(f); RA3.6.7(h); RA4.4.1; RA4.4.4; RA4.4.5; RA4.4.7.1; RA4.5.1; RA4.5.3; NA1.1; NA2.1.1; NA7.5.3.1(g); NA7.5.3.2; NA7.5.4.1(a) and(h) and (l); NA7.5.5.1(a) and (c); NA7.5.5.2; (NA7.5.6.1(b); NA7.5.9.1(a); NA7.5.15.1(a); NA7.5.17.1(a); NA7.5.17.2; NA7.6.1.4(c); NA7.6.1.6(c); NA7.6.2.6; NA7.7.2.1; NA7.7.4.1; NA7.7.5.1; NA7.7.6.1(c); support multifamily unification	The Energy Code refers to the Reference Appendices where the testing procedures are applicable.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705

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238404.017	Statewide Utility Codes and Standards Enhancement Team	180.1(a)1 I recommend these addition allowance of 180.1(A)1Aand B apply to dwelling unit additions only, and that the requirements of 180.1(a) apply to common use area additions. I am still very concerned about how this section does not fully support additions to common use areas. These addition allowance make sense for a dwelling unit addition but not a common use area addition (let's say the lobby). support multifamily unification	Staff finds that the commenter misunderstands the effect of the code language. The language in parent section 180.1(a) specifies that "Sections 110.0 through 110.12, and 160.0, 160.1, 160.2(c) and (d), 160.3 through 170.2" apply to additions as prescriptive requirements. 180.1(a)1, inclusive of its subsections, modifies only the envelope requirements. The distinction between dwelling and common areas is not relevant to any envelope requirements, and other areas are held to the relevant requirements applicable to newly constructed buildings. 180.1(a)2 and 3 provide similar modifications to mechanical ventilation and water heating systems (respectively). Dwelling versus common use area distinctions only apply to thermostat and lighting requirements. Staff therefore does not find that this section language fails to "fully support" additions to common use areas.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.018	Statewide Utility Codes and Standards Enhancement Team	180.1(a)2 and 180.1(b)3 I recommend "common use area" IAQ additions be clear as opposed to "dwelling unit " IAQ additions. Support Charles Knoff docket. dwelling unit stuff looks good support multifamily unification	Staff has clarified the use of the term "common area" and "common use area" in the adopted language, consistent with the commenter's recommendation.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.019	Statewide Utility Codes and Standards Enhancement Team	180.1(a)3 As written, I can prescriptively add any amount of water heating equipment, is that the intent? 150.2(a)1D limits new equipment to just a second piece of equipment. Will this also change the ACM rules? support multifamily unification	This language is not intending to limit the amount of water heaters installed in a building.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.02	Statewide Utility Codes and Standards Enhancement Team	180.1(b)2 Exception "wood" should be added....in wood framed walls... This should not apply to metal framed walls support multifamily unification	This matches language brought over from 150.0's requirements. This is not part of the scope of this rulemaking. Staff will consider this change for the 2025 cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.021	Statewide Utility Codes and Standards Enhancement Team	180.2(b)3 C Confirm these will apply to altered DHW serving common use areas? These look to be DHW systems serving dwelling units only support multifamily unification	These requirements are specific to water heating systems serving individual dwelling units.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205

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238404.022	Statewide Utility Codes and Standards Enhancement Team	180.2(b) New requirements of 141.0(b)2Q Are the new air barrier requirements omitted on purpose? support multifamily unification	The new air barrier requirements were not applicable to multifamily buildings. Staff will consider extending this proposal to multifamily buildings for the 2025 code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238404&DocumentContentId=71705
238404.023	Statewide Utility Codes and Standards Enhancement Team	180.2(b)5 I recommend "common use area" IAQ alterations be clear as opposed to "dwelling unit " IAQ alterations I am still very concerned about how this section does not fully support alterations to common use areas. support multifamily unification	The commenter's concerns are unclear. Nonetheless, staff worked to clarify the distinction between dwelling and common areas in the revised Express Terms, noting that these differ in HVAC requirements only with relation to the type of thermostat used to control the space. In addition, the ability to use residential thermostats to control common areas was narrowed to "Heating or cooling systems exclusively serving dwelling units and common use areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units that would otherwise lack these provisions" by edits made to Section 160.3(a)2. Otherwise, staff does not agree that the relevant language fails to "fully support" additions to common use areas.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238404&DocumentContentId=71705
238404.024	Statewide Utility Codes and Standards Enhancement Team	180.2(c) software unification impacts Currently, CBECC-Res and CBECC-Com do not treat altered features the same in terms of compliance TDV values, and how can this code language be altered to support what may be happening? Currently this only supports how CBECC-Res deals with dwelling unit features. support multifamily unification	Staff appreciates the comment of support - staff notes that the comments relating to the CBECC software are not related to proposed amendments to regulation. None the less, staff are committed to continuing to improve the CBECC software.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238404&DocumentContentId=71705
238404.025	Statewide Utility Codes and Standards Enhancement Team	110, 129, 130, 140, 150, 160 Support Charles Knuffke Lighting and IAQ proposed language in docketed comment. https://efiling.energy.ca.gov/GetDocument.aspx?tn=238269&DocumentContentId=71562 Lighting language clarifications	Staff appreciates the comment and notes the commenter's support of the referenced document.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238404&DocumentContentId=71705
238404.026	Statewide Utility Codes and Standards Enhancement Team	100.1 100.1 "Nonresidential Compliance Manual" needs to include low rise residential. Definition needs to include new low-rise residential building type since being moved from Residential Manual support multifamily unification	The compliance manuals will be updated to include low-rise multifamily requirements to consolidate all multifamily requirements.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238404&DocumentContentId=71705

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238404.027	Statewide Utility Codes and Standards Enhancement Team	100.1 "Nonresidential Building: needs to remove "high-rise residential buildings" No longer in those sections support multifamily unification	Thank you for alerting us. Staff will work to address this issue.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.028	Statewide Utility Codes and Standards Enhancement Team	120.8 NOTE: Nonresidential buildings include nonresidential spaces occupancies such as nonresidential function areas within hotel/motel and high-rise residential buildings. The requirements of Section 120.8 apply based on the square footage of the nonresidential spaces occupancies. Make it clear we are talking about missed-use residential buildings that include nonresidential occupancies, not space types. This causes a lot of confusion in how the Cx requirements apply to hotel/motel/multifamily buildings with or without nonresidential occupancies (mixed-use).	Thank you for the comment. We will update the compliance manuals as appropriate to address this concern.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.029	Statewide Utility Codes and Standards Enhancement Team	150 Exception to 150.0(o)1Giva needs to be removed "Exception to 150.0(o)1Giva: For multifamily dwelling units, the manual ON OFF control shall not be required to be accessible to the dwelling unit occupant. " Remove reference to multifamily in single family subchapter support multifamily unification	Thank you for the comment. This exception was removed in 15-day language.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.031	Statewide Utility Codes and Standards Enhancement Team	160.5(b)4 Fix UpdateTable 120.1-A and Section 120.2(e)3 references to 160 Think it was missed support multifamily unification	Thank you for the comment. Staff will work to address this in the next available code cycle as appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.032	Statewide Utility Codes and Standards Enhancement Team	160.2 Equation 160.2-A missing Think it was missed support multifamily unification	This equation was added.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705

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238404.033	Statewide Utility Codes and Standards Enhancement Team	170 45 day updates made to subchapters outside of 170 not fully captured here, is that on purpose? New air barrier requirements of 140.3(a)9 are not included in 170.2, is this on purpose? support multifamily unification	The new air barrier requirements were not applicable to multifamily buildings. Staff will consider extending this proposal to multifamily buildings for the 2025 code cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.034	Statewide Utility Codes and Standards Enhancement Team	170.2(e)3E This should not be it's own subtext, but in line with 170.2(e)3D above Not lined up correctly support multifamily unification	Staff appreciates the comment. Section 170.2(e)3E is about tailored method and area category method and this requirement as listed as 170.2(e)3E is logical. Staff do not find it to be necessary to be within 170.2(e)3D. No changes were made.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.035	Statewide Utility Codes and Standards Enhancement Team	170.2(e)3F becomes 170.2(e)3E Not lined up correctly support multifamily unification	Section 170.2(e)3F is about tailored method and area category method and this requirement as listed as 170.2(e)3F is logical. Staff do not find it to be necessary to become 170.2(e)3E. No changes were made.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.036	Statewide Utility Codes and Standards Enhancement Team	170.2(e) missing 140.6(b)4 Needed to support when additional power allowances of Table 170.2-M and 170.2-N support multifamily unification	Staff appreciates the comment. Section 170.2(e)4A is the section that reproduces the language that is identified in 140.6(b)4, the Area Category Method. This section includes provisions that the building may add additional lighting power allowances for qualifying lighting systems as specified in the Qualifying Lighting Systems columns in Table 170.2-M and in accordance with the corresponding footnote of the table shall qualify for the additional lighting power allowances. Staff concludes the Section supports additional power allowances of Table 170.2-M. Section 170.2(e)4B, the Tailored Method, includes provisions that the building may add additional lighting power allowances for qualifying wall display lighting, task lighting, and decorative/special effects lighting and in accordance with the lighting power allowance values for the specified lighting system in the specified lighting column in Table 170.2-N. Staff concludes the Section supports additional power allowances of Table 170.2-N. No changes were made.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205
238404.037	Statewide Utility Codes and Standards Enhancement Team	Table 170.2-N Missing column number 4 which in turn is causing confusion in 170.2(e)4Bviii looks like a typo support multifamily unification	There is a missing column number 4 in Table 170.2-N. Staff will work to correct this nonsubstantive change as appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71205

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238404.038	Statewide Utility Codes and Standards Enhancement Team	170.2(e)4Bix Reference to Column 5 should be included to line up with 170.2(e)4Bviii and vii above Would make things flow better support multifamily unification	Staff appreciates the comment. No changes were made, as the suggestion would not improve clarity.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.039	Statewide Utility Codes and Standards Enhancement Team	Table 170.2-P Equations missing looks like a typo support multifamily unification	Thank you for the comment. These equations were inserted.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.04	Statewide Utility Codes and Standards Enhancement Team	150.1(c)14 Include low-rise multifamily since 170.2(f) points to 150.1(c)14, multifamily should be included in the 150.1 language support multifamily unification	Thank you for the comment. This modification was made.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.041	Statewide Utility Codes and Standards Enhancement Team	180.2(b)1 B It is not clear if these requirements apply to common use areas AND dwelling unit roofs since there is "dwelling unit" language included. Not sure how the 3rd party verification will work with 4-stories or greater. This needs to be clarified or cleaned up. Not clear how to apply to dwelling unit AND common use area altered roofs. How will the 3rd party inspection happen for highrise multifamily buildings? support multifamily unification	The code language was developed to apply to roofs serving dwelling units and common areas of multifamily buildings. Supporting material will be provided in the compliance manual to address these concerns.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.042	Statewide Utility Codes and Standards Enhancement Team	180.1 exception 6 wrong section # used, change to 180.1 Looks like a typo, 150.2(a) used support multifamily unification	Thank you for the comment. This has been corrected.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.043	Statewide Utility Codes and Standards Enhancement Team	180.2(b)2 Aii missing language on ducts in garage spaces of 150.2(b)1Diic This happens when systems are in parking garage, are you sure you don't want to include this language? support multifamily unification	As part of the multifamily restructuring and unification, the decision was made to not apply this to all multifamily buildings.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705
238404.044	Statewide Utility Codes and Standards Enhancement Team	180.2(b)2 Biic indent issue looks like a typo support multifamily unification	Thank you for the comment. This formatting has been corrected.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238404&DocumentContentId=71705

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238404.045	Statewide Utility Codes and Standards Enhancement Team	120.1 Table 120.1-A Occupancy types should be sorted by alphabetical order within each category (eg alphabetical within "Educational Facilities" and alphabetical within "Food and Beverage Service" Difficult to find what you are looking for. Table 120.1-B is alphabetical	Thank you for your comment. Staff is considering whether to make this change in the 2025 standards.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.046	Statewide Utility Codes and Standards Enhancement Team	JA11.3 Documentation procedures needed to support Exception 1 to 150.1(c)14 provided via the Certified Solar Assessment tools Building departments are struggling with how to confirm the exception has been used appropriately.	Staff is working with solar assessment tool providers to produce better shading report documentation. Clarification of the intent of this requirement will be addressed within the compliance manuals.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.047	Statewide Utility Codes and Standards Enhancement Team	150 EXCEPTION 1 to Section 150.0(m)1B clarify who is intended to provide visual inspection Condition "i" and "iii" indicate "as confirmed by visual inspection", but does not identify who's responsible for verifying whether the condition has been met. If this is intended to be verified by the authority having jurisdiction (AHJ), I suggest indicating this here. Otherwise, I suggest removing "as confirmed by visual inspection" to avoid confusion of this having to be HERS verified.	Staff appreciates the comment. As with all building standards, the AHJ is responsible for ensuring that code requirements have been satisfied prior to permit issuance, including the visual inspection requirement referenced here.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.048	Statewide Utility Codes and Standards Enhancement Team	150 Section 150.0(o)1Gvb clarify who is intended to provide visual inspection Section 150.0(o)1Gvb. indicates "Visual inspection shall verify the installed system conforms to the requirements", but does not identify who's responsible for verifying whether the condition has been met. If this is intended to be verified by the authority having jurisdiction (AHJ), I suggest indicating this here. Otherwise, I suggest removing "Visual inspection shall verify the installed system conforms to the requirements" to avoid confusion of this having to be HERS verified.	Staff notes that the visual inspection requirement is existing language, and is specifically included under a heading of CMC compliance - HERS Raters are not specified in the CMC and not responsible for CMC requirements. The expectation is that this cursory visual inspection, when necessary, will be performed as part of routine inspection for compliance with CMC requirements, distinct from HERS inspection for compliance with Energy Code compliance.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705

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238404.049	Statewide Utility Codes and Standards Enhancement Team	150 Section 150.0(o)1Gvi include the sound rating requirement in the Energy Code to avoid confusion Section 150.0(o)1Gvi indicates "...rated for sound in accordance with Section 7.2 of ASHRAE 62.2" but does not include what the sound rating requirement is. Referencing codes outside of what's adopted by the BSC is problematic for installers and building department staff and recommend including the sound rating in the Energy Code to avoid confusion. FYI, the sound rating requirement is also referred to in Section 150.0(o)2Bii and implies the rating can be found in Section 150.0(o)1Gvi.	The Energy Standards adopts sections of ASHRAE 62.2 by reference with some of the language incorporated explicitly, usually with amendments. Current practice, CEC has copied and pasted applicable sections of ASHRAE 62.2 into the residential compliance manual for public use, and the same will be done for the 2022 Standards.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238404&DocumentContentId=71705
238404.05	Statewide Utility Codes and Standards Enhancement Team	Section 150.0(o)1Kii Clarify whether some solid fuel burning appliance types may be used in dwellings <1000 ft ² Section 150.0(o)1Kii indicates "solid fuel burning appliances shall not be installed inside the pressure boundary in dwelling units with conditioned floor area less than 1,000 ft ² ." Does this mean a wood stove or fireplace may NOT be installed in dwellings <1000 ft ² ? If so, this requirement has a very high probability of causing compliance issues in rural areas of CA. If this is not the intent to prohibit wood burning stoves in dwellings < 1000 ft ² , I recommend adding an exception. If this is the intent and if some types of solid fuel burning appliances are okay to install, I suggest clarifying what types may be installed.	This language has been deleted in the 15-day draft.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238404&DocumentContentId=71705
238404.051	Statewide Utility Codes and Standards Enhancement Team	Section 150.0(o)1Kiii include ASHRAE 62.2 Section 6.4 requirement in the Energy Code to avoid confusion Section 150.0(o)1Kiii indicates that combustion and solid fuel burning appliance "shall conform to the requirements in ASHRAE 62.2 Section 6.4", but does not include these requirements. Referencing codes outside of what's adopted by the BSC is problematic for installers and building department staff and recommend including the requirements in the Energy Code to avoid confusion.	The Energy Standards adopts sections of ASHRAE 62.2 by reference with some of the language incorporated explicitly, usually with amendments. Current practice, CEC has copied and pasted applicable sections of ASHRAE 62.2 into the residential compliance manual for public use, and the same will be done for the 2022 Standards.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238404&DocumentContentId=71705
238404.052	Statewide Utility Codes and Standards Enhancement Team	Sections 150.0(s), 150.0(t), 150.0(u) and 150.0(v) Clarify whether the cumulative requirements are feasible with commonly installed electrical panels. Sections 150.0(s), 150.0(t), 150.0(u) and 150.0(v) have a cumulative requirement of 150 amps (three dedicated 30 amp, 240 volt branch circuits and one 60 amp, 240 volt branch circuit). My concern is whether a typical main panel with a busbar rating of 225 amps has enough capacity for these additional loads.	The 60 amp requirement in 150.0(s) is not additive to the other requirements. This requirement ensures the ESS can backup a minimum of 4 circuits and 60 amps. All electric houses are currently being constructed with 225 amp busbar.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238404&DocumentContentId=71705

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238404.053	Statewide Utility Codes and Standards Enhancement Team	150.1(b)3Bi Include the term "CEER" (Combined Energy Efficiency Ratio) in Section 100.1 Definitions 150.1(b)3Bi: Section 150.1(b)3Bi includes the term "CEER", but this term is not included in Section 100.1 Definitions. This term "CEER" (Combined Energy Efficiency Ratio) is an efficiency metric typically associated with window air conditioners and is being introduced into Section 150.1.	Staff appreciates the comment. The draft 15-day language includes a definition for CEER which addresses this comment.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.054	Statewide Utility Codes and Standards Enhancement Team	150.1(c)8 Note Remove or clarify the purpose for "NOTE: The space conditioning system shall be a heat pump as specified in Section 150.1(c)7" occurring in Section 150.1(c)8 Water Heaters The note in Section 150.1(c)8 which references space conditioning systems seems out of place in the water heating section. I suggest removing it, or clarifying the purpose for it in Section 150.1(c)8	This note is intended strictly as a courtesy note that when exception 1 is applied, the space conditioning system shall be a heat pump.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.055	Statewide Utility Codes and Standards Enhancement Team	140.3(a)5 Conditioned greenhouses are exempt from 140.3(a)5 all together. No need to list the exemption under every requirement, 140.3(a)5A, 140.3(a)5b..... just list it once at the end.	Staff finds that stating exemption here prevents and precludes unintended alternate readings that equate clear greenhouse walls to "exterior windows" or otherwise treat the items as synonymous or fungible. Staff finds this language appropriate to retain for this reason.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.056	Statewide Utility Codes and Standards Enhancement Team	140.3(a)6 Conditioned greenhouses are exempt from 140.3(a)6 all together. No need to list the exemption under every requirement, 140.3(a)6A, 140.3(a)6b..... just list it once at the end.	Staff finds that stating exemption here prevents and precludes unintended alternate readings that equate clear greenhouse walls to "exterior windows" or otherwise treat the items as synonymous or fungible. Staff finds this language appropriate to retain for this reason.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.057	Statewide Utility Codes and Standards Enhancement Team	140.3(a)9A Remove the first word "Design"	Staff finds that retaining the title statement is appropriate.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.058	Statewide Utility Codes and Standards Enhancement Team	140.4(a)2 consider formatting 140.4(a)2 into a table. This will greatly improve the readability of this new requirement	Staff will consider formatting 140.4(a)2 as a table in the compliance manual	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238404.059	Statewide Utility Codes and Standards Enhancement Team	140.6(b) Formatting issue at 140.6(b) Calculation of Allowed Indoor Lighting Power: General Rules	The 45-day Formatting issues (numbering) of 140.6(b) has been resolved.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238404&DocumentContentId=71705
238405.001	Tom Phillips	These comments are a duplicate of comment 238402.	These comments are a duplicate of previous comment. Please see responses in rows 773 through 779.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238405&DocumentContentId=71706
238407.001	Alice Sung	Following up on earlier comments I have made, both in writing and through speaking at public hearings, I urge you to revise the proposals to include a required all-electric baseline for all building types, and short of that; at least for all public sector buildings, with a special emphasis on public pre-K-14 school buildings, including all pre-school, K-12, as well as community college buildings, and higher education.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions, including transitioning schools.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238407&DocumentContentId=71708

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238407.002	Alice Sung	As infants and youth are more susceptible to the impacts of both indoor and outdoor air pollution compounded by exposures to gas combustion within buildings where they live, learn, play and will actively work in, to say nothing of methane leakages, it is critical that they not be left behind in your consideration. This should also include all in-home and standalone day care centers, early childhood education centers, and child care facilities on campuses.	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=2384078&DocumentContentId=71208
238407.003	Alice Sung	As you are aware, since these public education facilities are NOT under the local (i.e. municipal Reach Codes) jurisdiction having authority, but rather the State DSA/ State Building Codes themselves, it is imperative that the CEC not wait until the 2025 code to decarbonize this sector to protect the public health, safety, and welfare of our children; especially the over 50% of our public school population that are Title 1 eligible for free and reduced price lunches in low income and disadvantaged frontline communities most impacted by climate change and pollution.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=2384078&DocumentContentId=71208
238407.004	Alice Sung	It is also urgent to capture the opportunities of a 2022 all-electric code for both new construction AND retrofitting of existing school buildings in the public PreK-14 schools sector to prepare for and to leverage immediate and future funding programs in some \$100-130 billion in potential federal infrastructure (or other state funding mechanisms) to retrofit/modernize school facilities, to decarbonize, add EV infrastructure, solar and battery storage with SMART inverters/controls technologies for our public schools. This would not only save operating dollars that could be shifted into educational program, it would avoid stranded gas assets, more wisely invest public dollars, and provide all the benefits of a zero carbon school district system, statewide. Thank you for your consideration.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	6/21/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=2384078&DocumentContentId=71208
238411.001	Taylor Engineering	Demand controlled ventilation (DCV) is an energy efficiency strategy that reduces ventilation during periods of partial occupancy. Section 120.1(d)4 narrowly defines the mandatory requirements for DCV such that they can only be met through the use of CO2 sensors. Though CO2 measurement has been this predominant industry approach for achieving this control strategy, this very restrictive definition precludes emerging alternative options for monitoring partial occupancy, such as through the use of people counting sensors, security RFID badges, ticket sales, and other digital strategies. [...] Please consider revising the Title 24 definition to match that of ASHRAE Standard 90.1, or including an exception to allow for alternative occupant-counting strategies[.]	The 2022 Energy Code does not have proposed changes to these measures. We invite the commenter to submit a proposal for the 2025 code cycle.			
238412.001	Taylor Engineering	Please consider deleting Exception 1 to Section 140.4(k)4. Variable flow chilled and hot water systems are commonplace for systems of this size, as are chilled and hot water temperature reset controls, particularly with DDC controls and resources such as ASHRAE Guideline 36. They are not mutually exclusive options.	This is not part of the scope of this rulemaking. Staff will consider this change for the 2025 cycle	6/22/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?m=2384128&DocumentContentId=71213

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238412.002	Taylor Engineering	Please consider revising Section 1404.4(k)4 to reset temperatures based on valve position. Chilled and hot water temperature reset controls are increasingly commonplace in new construction with DDC controls and new momentum around resources such as ASHRAE Guideline 36. The current language prescriptively requires chilled and hot water temperature reset but only vaguely suggests that the reset should be accomplished "as a function of representative building loads or outside air temperature." Open-loop reset strategies (such as OAT-based reset) are good for retro-commissioning applications to implement temperature resets with low-to-no-cost energy conservation methods, but run the risk of not meeting thermal loads (due to the lack of a feedback loop) and being disabled or otherwise ineffective. In new construction, best and common practices employ valve demand to implement hydronic temperature resets. ASHRAE Standard 90.1 also specifically requires the use of valve position to reset setpoints where DDC is available[.]	This is not part of the scope of this rulemaking. Staff will consider this change for the 2025 cycle	6/22/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238412&DocumentContentId=71213
238412.003	Taylor Engineering	Please consider adding boiler turndown requirements to Section 140.4(k). ASHRAE Standard 90.1 includes minimum boiler turndown requirements for systems with design inputs of at least 1 million Btu/h. Boiler efficiency degrades at very low part loads due to standby and cycling losses.	This is not part of the scope of this rulemaking. Staff will consider this change for the 2025 cycle	6/22/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238412&DocumentContentId=71213
238412.004	Taylor Engineering	Please consider revising hydronic variable flow system requirements in 140.4(k)1 to achieve flow rates of 25% of the design flow rate. Title 24 currently requires hydronic systems to be capable of reducing pump flow rates to no more than the larger of 50% of the design flow rate or the minimum flow required by the equipment. ASHRAE Standard 90.1 includes similar language, but requires that flow rates "be capable of and configured to reduce pump flow rates to no more than" 25% of the design flow rate or the minimum flow required by the equipment.	This is not part of the scope of this rulemaking. Staff will consider this change for the 2025 cycle	6/22/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238412&DocumentContentId=71213
238412.005	Taylor Engineering	The final CASE report "High Efficiency Boilers and Service Water Heating Code Change Proposal" includes suggested revisions to the ACM manual to correspond with the prescriptive code changes. The report includes a requirement for the standard design to have "flow rates that are 20% of the design flow rates of an operating boiler." This requirement does not makes sense and would almost certainly prevent the standard design from meeting loads at the design condition. Care must be applied when establishing the ACM Manual requirements and considering modeling capabilities.	Thank you for the comment and staff will ensure the standard design flow rate make sense during the ACM manual update	6/22/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238412&DocumentContentId=71213
238418.001	Carrier Corporation	Section 100.1 – Definitions and Rules of Construction, Page 57 - AIR-COOLED AIR CONDITIONER. A definition is provided for air-cooled air conditioner, but similar definitions are not provided for water cooled and evaporatively cooled air conditioner. To be consistent three types should be included.	Staff appreciates this comment. Water-cooled air conditioners are not defined and used within the standard. Staff will look to include this for the next code cycle.			

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238418.002	Carrier Corporation	Section 100.1 – Definitions and Rules of Construction, Page 57 - AIR-HANDLING UNIT or AIR HANDLER. The definition is not technical [sp.] complete. An air handler is more than just a blower or fan and may include a cooling coil, heating coil, filters, noise treatment, economizers and more. Should also likely include a fan coil which technical [sp.] is the same but the common term used for smaller units.	Staff appreciates this comment, but has found this definition to be appropriate for the purposes of its use in the standards.			
238418.003	Carrier Corporation	Section 100.1 – Definitions and Rules of Construction, Page 58 - AIR-SOURCE HEAT PUMP. A definition is included for air source heat pumps but seems like there should also be a definition for water source and geothermal heat pumps as they are referred to in the standard requirements.	Staff appreciates this comment. Water-source heat pumps are not defined and used within the standard. Staff will look to include this for the next code cycle.			
238418.004	Carrier Corporation	Section 100.1 – Definitions and Rules of Construction, Page 59 - AHRI 210/240 referenced standard is wrong version. We see that AHRI 210/240 Standard was updated to the 2017 version, but you did not include the new 2023 version that will be the controlling standard as of 1/1/2023. The reference standard for AHRI 210/240-2017 will be used until the end of 2022 and then will be superseded by the AHRI 210/240-2023 and the new SEER2 and HSPF2 so both standards need to be included in the references as well as the requirements for SEER2 and HSPF2.	AHRI 210/240-2023 was not adopted at the time the 2022 Energy Code Rulemaking began.			
238418.005	Carrier Corporation	Section 100.1 – Definitions and Rules for Construction, Page 60 - AHRI 560 referenced standards is soon going to be revised. AHRI 560 is a standard for absorption chillers that has been update and should be published soon as version AHRI 560-2021.	Staff appreciates this comment, but cannot update references for unpublished standards.			
238418.006	Carrier Corporation	Section 100.1 – Definitions and Rules for Construction, Page 60 - AHRI 920 refence standard is the wrong version. The reference standard should be AHRI 920 with addendum 1 and not just AHRI 920.	Staff agrees with commentator and will make this change in the next code cycle.			
238418.007	Carrier Corporation	Section 100.1 – Definitions and Rules for Construction, Page 60 - AHRI 1230 refence standard is the wrong version. The reference standard is listed as the 2014 version. It should be the 2021 version.	At the time of the 2022 Energy Code rulemaking, AHRI 1230-2014 with addendum 1 was the most recent version of this standard.			
238418.008	Carrier Corporation	Section 100.1 – ASHRAE Climate Data for Regions and possible update data and zones, page 61. I suspect the weather data may be out of date and ASHRAE has developed new data and updated the climate zone information documented in ASHRAE 169-2020. Would be nice if California aligned their climate zones with the rest of the world, but it is also likely that the California climate zone boarders have changed due to global warming.	The Energy Commission updated its weather files and climate assumptions as a part of developing the 2022 proposals; staff does not find these to be out of date, while acknowledging that CEC data models are not identical to ASHRAE data models. Energy Code Climate Zone borders are based on geographic features that create localized climate differences, and these features will continue to apply differentiating effects even under the global effects of climate change. Staff therefore does not find that adjusting these borders is necessary as a part of this code update.			
238418.009	Carrier Corporation	Section 100.1 Closed Circuit Cooling Tower page 65. A specific definition has been included for closed circuit cooling towers but there is no definition for open circuit cooling towers that are commonly used and referred to in the standard.	Staff appreciates this comment and have included this into 'Open Cooling Tower' definition.			
238418.01	Carrier Corporation	Section 100.1 – Computer Room Definition, page 66 definition is not aligned with other standards. ASHRAE 90.1 and 90.4 have agreed on a new definition for computer rooms to have an IT equipment load larger than 10 kW vs the 20 watts/ft2 used in Title 24. It would be good to align with other standards.	The definition for Computer Rooms was revised to include the term information technology equipment, but was not changed to more closely follow the ASHRAE definition. An analysis will need to be included on the cost and benefits of aligning the definition to ASHRAE.	6/22/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tc=238418&DocumentContentId=71720

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238418.011	Carrier Corporation	Section 100.1 – Condenser Definition, page 66. The definition is included for air cooled refrigeration condensers, but no similar definitions have been included air water cooled and evaporatively cooled refrigeration condensers.	Staff appreciates this comment and will look to include these definitions in 2025.			
238418.012	Carrier Corporation	Section 100.1 – Dedicated Outdoor Air System (DOAS), page 67 – Definition not aligned with other standards. AHRI 920 has been revised to change and update the definition for DOAS. Also, it would be good to clarify when a product must comply with DOAS requirements and when it must comply with standard rooftop requirements. Do not understand how Title 24 can add requirements for the use of DOAS and have no minimum efficiency requirements?	Staff disagrees with the definition comment; DOAS definition is modeled after 90.1. Staff agrees with this minimum efficiency comment and have included minimum efficiencies which have been mistakenly left out.			
238418.013	Carrier Corporation	Section 100.1 – Degree Day, Heating – Related comment, page 67. Definition for heating degree day is included by no definition for cooling degree day CDD50.	Staff appreciates this comment and will look into this for 2025.			
238418.014	Carrier Corporation	Section 100.1 – DX-Dedicated Outdoor Air System (DX-DOAS), page 69 - definition question. The definition indicates that reheat is always part of a DX-DOAS. Reheat may be an option but there are other technological options that can be used to dehumidify air. Propose changing the definition to "...that dehumidifies 100 percent outdoor air and may include reheat that is capable of controlling the supply dry-bulb temperature of the dehumidified air to the designed supply air temperature".	Staff finds that T24 DOAS definition matches AHRI 920.			
238418.015	Carrier Corporation	Section 100.1 – Economizer, Pumped Refrigerant, page 69 – definition question and clarification. Glad to see you added the definition, but the use of refrigerant for free cooling is not limited to cooling air and is also used to cooling water for chilled water systems without running the compressor. Suggest the definition be expanded. Also recommend you remove the pump requirement as some products can provide refrigerant free cooling without the use of a pump.	Staff finds this not to be appropriate to expand the definition until products using these alternate approaches exist and can be evaluated for efficiency. Pumped refrigerant economizer definition was intentionally targeted for computer rooms. Staff will look to clarify this for 2025.			
238418.016	Carrier Corporation	Section 100.1 Enthalpy Recovery Ratio (ERR), page 71 - Definition suggestions. Change definition to align with AHRI 1060 which defines ERR as A ratio of the change in enthalpy of the Entering Supply Airflow and the Leaving Supply Airflow to the difference in enthalpy between the Entering Supply Airflow and the Entering Exhaust Airflow, with no adjustment to account for that portion of the psychrometric change in the Leaving Supply Airflow that is the result of leakage of Entering Exhaust Airflow rather than exchange of heat or moisture between the airstreams.	Staff finds the Energy Code uses "Enthalpy Recovery Ratio" in contexts beyond DX-DOAS, therefore not appropriate to use a DX-DOAS specific version of the definition.			
238418.017	Carrier Corporation	Section 100.1 Integrated HVAC System, page 77 – definition question. Not sure why this definition is being added and is it just for DOAS or are you trying to require all units to have a sensible heat factor of <0.65 which is aggressive. Should this be added under DOAS definition as a further requirement or better yet in the prescriptive requirements for DOAS.	Integrated HVAC System definition was included as part of the horticulture proposal.			

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238418.018	Carrier Corporation	Section 100.1 Integrated Energy Efficiency Ratio – missing definition, page 77. We see that you have included most of the new integrated metrics for IPLV, IS COP and ISMRE, but the definition for Integrated Energy Efficiency Ratio (IEER) defined in AHRI 340/360 is missing and should be added. Recommend you include the following, "A weighted calculation of mechanical cooling efficiencies at full load and part-load Standard Rating Conditions, defined in AHRI 340/360, expressed in Btu/W-h."	Staff finds this definition in Section 100.1 and has been unchanged from the previous code cycle.			
238418.019	Carrier Corporation	Section 185 LOW-GWP REFRIGERANT – Definition not used in the standard, page 85. The definition for Low-GWP is listed as having a GWP less than 150. This does not align with the requirements of CARB for the phasedown of high GWP refrigerants. The definition is included but never used in the standard and we recommend it be removed as it does not impact energy efficiency.	This definition has been in place since the previous code cycle.			
238418.02	Carrier Corporation	Section 100.1 Microchannel Condenser, page 85 – Definition question. Definition is OK, but not sure why it is needed. Also, there are now microchannel evaporators.	This term is used in an exception in covered processes. Staff has not found a use for the term "microchannel evaporator."			
238418.021	Carrier Corporation	Section 100.1 Multiple Zone System, page 86 – Definition question and suggestion. What you are defining is a multizone VAV system so it should be labeled as such and contain the requirements on minimum airflow of 40%. Should also include a definition of single zone VAV which is defined in AHRI 340/360-2021.	Staff appreciates the comment and has revised the definition. The Multi Zone is defined as part of the fan power budget proposal, and staff does not find the need within the standards to define a single zone VAV.			
238418.022	Carrier Corporation	Section 100.1 Single Packaged Vertical Air Conditioner (SPVAC), page 97 – Definition comments and questions. This definition is directly from AHRI 390 which is good. AHRI 390 is limited to 240,000 Btu/hr. and larger units are rated per AHRI 340/360 so that might be worth clarifying. Overall, some products have definitions but title 24 does not have definitions for all products so it seems inconsistent.	The Energy Code includes definitions found to be necessary for terms used in the code, based on needing a more specific or less usual use than the general or common meaning of a given term - not every product type definition is included, as not all are used within the code in ways that make express definition necessary. The terms in referenced test standards are incorporated by reference and are applicable when/where the referenced standard applies.			
238418.023	Carrier Corporation	Section 100.1 Thermostat Expansion Valve, page 99 – Definition comment. Definition is OK, but it is really needed. There are many other types of expansion devices including Electronic Expansion Valves, float valves for large chillers, fixed orifices, capillary tubes and many more so again if one is defined then should all options be defined	Staff appreciates this comment and will look into this in 2025.			
238418.024	Carrier Corporation	Section 100.1 Ventilation System, Central Fan Integration or CFI – Definition comment. This definition is focused on dwelling unit space, but ventilation systems are used on all buildings so why is the definition limited to just dwelling units. This is somewhat redundant to DOAS unit definition. Maybe it would be good to have a general definition with sub-definitions.	The definition is consistent with ASHRAE 62.2 and the term is only used in relation to residential equipment in Energy Code.			
238418.025	Carrier Corporation	Section 110.2 (a) Exception 1 to Section 110.2(a) The Kadj equation has been revised by ASHRAE 90.1 to allow for higher water temperatures now used for data centers and to expand the scope of Kadj. This has been released and is currently out for the second public review ISC and will close on July 5th. Recommend that the following revised language be used which is the ASHRAE 90.1 addendum X language modified to reference the Title 24 tables. Note that ASHRAE also changed water to liquid to allow for freeze protection.	The Energy Standards cannot incorporate references to unpublished reference documents in regulatory language; as an issue of timing, inclusion of this revision will need to occur as a part of a subsequent rulemaking proceeding.			

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238418.026	Carrier Corporation	Section 110.2(a) – Efficiency – page 4 – missing efficiency requirements. Several tables for equipment efficiency have not been included in Title 24 but would be good to add to align with what is in ASHRAE 90.1-2019.	Additional efficiency tables and categories have been included in the Energy Code to better align with ASHRAE.			
238418.027	Carrier Corporation	Table 110.2-A Air Conditioners and Condensing Units -Minimum Efficiency Requirements, page 110. The requirements for <65,000 Btu/hr are missing. We know these are also defined on Title 20 but Title 20 is out of date and does not reflect the new SEER2 requirements going into effect federally on 1/1/2023 for single phase and for 3 phase they are schedule to go into effect on 1/1/2025 per the DOE ruling.	The Energy Code will continue to exclude systems <65,000 Btu/hr and allow these to be defined in the Title 20. This is to reduce chances for confusion if appliance standards are updated.			
238418.028	Carrier Corporation	Table 110.2-A Air Conditioners and Condensing Units -Minimum Efficiency Requirements, page 110. Note a should be removed as the IEER applies to all products and the note appears to be left from old requirements with IPLV.	This revision was included.			
238418.029	Carrier Corporation	Table 110.2-B Heat Pumps, Minimum Efficiency Requirements, page 113. The requirements for <65,000 Btu/hr are missing. We know these are also defined on Title 20 but Title 20 is out of date and does not reflect the new SEER2 and HSPF2 requirements going into effect federally on 1/1/2023 for single phase and for 3 phase they are schedule to go into effect on 1/1/2025 per the DOE ruling.	The Energy Code will continue to exclude systems <65,000 Btu/hr and allow these to be defined in the Title 20. This is to reduce chances for confusion if appliance standards are updated.			
238418.03	Carrier Corporation	Table 110.2-B Heat Pumps, Minimum Efficiency Requirements, page 113. Note a should be removed as the IEER applies to all products and the note appears to be left from old requirements with IPLV.	This revision was included.			
238418.031	Carrier Corporation	Table 110.2-C Water Chilling Packages – Minimum Efficiency, page 118. The exception for centrifugal chillers with design leaving evaporator temperature <36 F should be combined with positive displacement chillers with design leaving fluid temperature ≤32 F as it now applies to all chillers per the new ASHRAE 90.1 addendum X and change to AHRI 550/590 rating procedures. The word fluid should be changed to liquid as fluid can be both a gas and a liquid. ASHRAE 90.1 and AHRI 550/590 made this change.	Several revisions included in this comment have been included.			
238418.032	Carrier Corporation	Table 110.2-F – Heat Transfer Equipment, page 123. The table has been deleted from ASHRAE 90.1-2019 as there are no minimum efficiency requirements have been defined and there are no plans. Recommend you delete from Title 24.	Staff appreciates this comments and have revised this table.			
238418.033	Carrier Corporation	Table 110.2-G – Performance Requirements for Heat Rejection Equipment, page 123. ASHRAE 90.1 has made several changes to this table and recommend you include the changes in title 24 update: A new category has been added for propeller or axial dry-coolers with a minimum efficiency of 4.5 gpm/HP; The refrigerant used for propeller or axial fan evaporative condensers has changed from R-507A to R2448A and the minimum performance has changed. R-507A can no longer be used; ASHRAE 90.1 revised the category for air cooled condensers to remove the reference to R-22 that can longer be used.	Staff appreciates these comments and have revised this table.			

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238418.034	Carrier Corporation	Table 110.2-H – Electrically Operated Variable Refrigerant Flow (VRF) Air Conditioners Minimum Efficiency Requirements, page 126. This table aligns with ASHRAE 90.1, but when you look at the AHRI directory there are no products listed for cooling only units and all units are heat pumps. Title 24 should consider removing the table.	Staff appreciates this comment, but finds that aligning with ASHRAE 90.1 is appropriate.			
238418.035	Carrier Corporation	Efficiency Tables 110.2 – Missing Efficiency Tables. The following tables are missing. Some of these are also duplicated in title 20. [See Carrier comment letter for complete list.]	Additional efficiency tables and categories have been included in the Energy Code to better align with ASHRAE.			
238418.036	Carrier Corporation	Section 120.1 (C)(1)(D) v – Filter Rack Gasket – comment on new requirements for gaskets, page 161. We have concerns with compliance in the language for the prescriptive requirements in 120.1(c)(1)(D) for gasket filter racks. Specifically, as written there is no tolerance in the requirement, it is unclear on how this requirement would be enforced, and with applications that utilize side loading filters, complying with this clause may inadvertently increase the amount of bypass around the filters due to crushing or binding during installation or service.	Staff appreciates the comment. The 15-day draft language revises the language for filter gasketing related to this comment.			
238418.037	Carrier Corporation	Section 120.2 (i) Economizer Fault Detection and Diagnostics (FDD), page 175. Expanding economizers down to 33,000 Btu/h is justified for units outside the building and for units adjacent to an outside wall but is not cost justified for units located inside the building. As this is section is just a requirement for diagnostics it might be appropriate to just require diagnostics for all air side economizers. You also should clarify that this is just for air economizers and does not apply to water or refrigerant economizers.	Staff has found that the economizer proposal is cost beneficial. Staff has found that 120.2(i) is clear in the intent of its application to air economizers.			
238418.038	Carrier Corporation	Section 120.10 a) Requirements for FEI – comments, page 207. Carrier feels that removing the exemption for all embedded fans that are in a certification program that is currently in AHSRAE 90.1 is not justified. [...] AHU's are comprised of embedded fans, and the applied nature of the product can require 1000's of variations that can effect the air flow patterns of that equipment. With no clear and consistent approach to test embedded fans in a standalone condition according to AMCA 208, Carrier recommends that all embedded fans be exempted from this requirement. Carrier believes that not exempting all embedded fans will lead to regulator and consumer confusion, as there is no sound approach to determining which units contain fans which are exempted, and which do not.	Staff appreciates this comment, but does not see the justification of CA giving an exemption for all embedded fans when ASHRAE and IECC code does not.			
238418.039	Carrier Corporation	Carrier also suggests adding all efficiency tables from product efficiency tables from ASHRAE 90.1, in doing so will exempt those future regulated products and increase clarity in the T24 code.	Additional efficiency tables and categories have been included in the Energy Code to better align with ASHRAE.			
238418.04	Carrier Corporation	The following exemption notes are in ASHRAE 90.1 and should be added: Fans used for moving gases at temperatures above 482°F. Fans used for operation in explosive atmospheres. Reversible fans used for tunnel ventilation. Fans outside the scope of AMCA 208. Fans that are intended to only operate during emergency conditions.	Staff has found and clarified that these exemptions are not found to be used in California. The emergency comment is included in the standards.			

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238418.041	Carrier Corporation	Section 140.4(c)1 Determining Fan System Electrical Input Power comments, page 252 (and similar language in 170.2.4. Overall, we understand the desire to improve on the old fan power allowances that were derived from ASHRAE 90.1, but we have some serious issues with the resulting limitations it will impose on the HVAC fan systems. The approach is a good approach, but the required improvements have been taken to an extremely and even our very best fan system that was just introduced with vane axile fans will have significant range restrictions placed on the equipment. We do not feel that this proposal as written should be implemented in the 2022 standard without significant changes.	Staff and its consultants have clarified with Carrier the calculations in determining Fan Power Budget, and the intent of the proposal is to encourage better design.			
238418.042	Carrier Corporation	Section 140.2(e) 1 Economizers, page 263 – reduction in minimum capacity for air economizers. We agree that extending the economizers down to 33,000 Btu/h from 54,000 Btu/h is appropriate, but we would recommend you limit this to units outside a building or adjacent to an outside wall. We do not feel it is cost justified to run ventilation and exhaust ductwork to fan coils located inside a building especially for replacement applications. [...] We would not recommend that the economizer requirements be extended down to 33,000 Btu/h for units inside the building and the DOAS exemption should not be added.	Staff finds that the economizer proposal is cost justified; designers have a free hand to design a system that meets requirements in a cost effective way.			
238418.043	Carrier Corporation	The requirements for 100% outdoor air on a VAV system should be revised to more like 80% because the VAV terminals are never going to be full open during periods when the economizer is being used. The 100% requirement for VAV is not appropriate and adds additional cost with no benefit.	Staff is unsure if commenter is referring to 140.4(e)1A. This damper is for the outside economizer damper to be able to supply full economizing when temperature permits.			
238418.044	Carrier Corporation	There should be an exemption for applications where the ventilation is 80% or more of the full load airflow as the incremental benefit is very small and not cost justified.	Staff agrees, but has not received information on the occurrences of this specific design and is out of scope of the proposals.			
238418.045	Carrier Corporation	With the reduction to 33,000 Btu/h there should be an exemption for residential as the load profiles due not really show significant benefits for air economizers like we see with commercial buildings.	The economizer proposal is a prescriptive requirement for commercial buildings.			
238418.046	Carrier Corporation	In the definitions there was an added definition for refrigerant pump economizers but there is no requirement listed in this section.	Refrigerant pump economizer definition was added in part of the data center economizer proposal.			
238418.047	Carrier Corporation	Section 140.2(p) Dedicated Outdoor Air Systems (DOAS) page 274 – comments on new requirements. The way we read the new requirements is that all spaces shall have a separate DOAS system with either exhaust air energy or energy recovery with 0.3 cfm/ft2 economizer air. We know that the justification for this was to cycle the fans on the rooftops, but we are not clear if the analysis considered that the base units have 2 speed fans and in some cases 3 speed or even variable speed fans. The cost justification analysis has not been shared. We do not feel this is cost justified and appropriate and the mandatory requirements for DOAS should be removed.	Staff has found that 0.3cfm/ft² is the minimum requirement to ensure energy savings and does not replace the ventilation requirements. The requirements for cycling fans are intended for the zone system fans such as FCU, VRF, or WSHF. The ability for terminal fans to cycle or stage up or down based on the thermostat and not to maintain ventilation is a key requirement in providing energy efficiency.			
238418.048	Carrier Corporation	The requirements for energy recovery are marginal in many of the California climate zones as energy recovery is not very effective in mild temperature operating conditions.	The proposal limits energy recovery based on the airflow and the climate zone. This does not include all California climate zones.			

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238418.049	Carrier Corporation	Delivering the air downstream from the fan coils is not how most systems are applied and the ventilation air is to the inlet to the coils so that integrated economizer operation can be used and the air is delivered effectively to the space. The added cost for this was ignored in the evaluation by the case team.	Staff has found that the integrated economizer approach is not energy efficient with fans running constantly. There is an exception for these system configurations when the fans meet a certain W/cfm, otherwise there is the performance approach to install these system types			
238468.001	Sonoma Clean Power Authority	Sonoma Clean Power, (SCP) the public power provider for Sonoma and Mendocino counties, submits this letter of support for the California Energy Commission's (CEC) draft code language (Express Terms) for 2022 Title 24 efficiency standards. ... Sonoma Clean Power appreciates the CEC's leadership in promoting efficient, low-carbon building solutions that align with California's climate goals, and we urge future endeavors that would support all-electric new construction within the Sonoma Clean Power service territory. Progress in the new construction space allows SCP to focus resources and financial assistance to the task of retrofitting existing homes and businesses and ensuring that all of our customers have access to low-carbon, safe, and healthy homes.	Thank you for the support and we will take your comment into consideration during future code development.	6/24/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?fn=238468&DocumentContentId=71272
238584.001	Rheia LLC	As a manufacturer of HVAC distribution systems using uninsulated ductwork, our position is that the proposed requirement for insulation on ducts in conditioned space (2022 Express terms Section 150.0(m)1B) is unnecessary and based on an overly conservative position on the risk of condensation and the impact of duct losses on distribution efficiency.	The proposed 15-day 2022 Standards remove the R-4.2 requirement and allow no insulation on ducts located in conditioned spaces that meet certain criteria, which addresses this comment. The revision encourages builders to relocate ducts from an unconditioned space, typically a vented attic, into the building's thermal envelope.	6/30/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?fn=238584&DocumentContentId=71316
238629.001	Professor Arnold Wilkins (University of Essex, UK)	1.Certain fluorescent lighting (those with magnetic ballasts) flickers at twice the input electricity frequency and is known to cause headaches and impair visual performance. LED light sources can have greater depth of modulation than that of fluorescent lighting.	The code language has been reverted to 2019 requirements based on the stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238629
238629.002	Professor Arnold Wilkins (University of Essex, UK)	2.It has recently been shown that during a rapid eye movement (saccade) the brain uses the moving image to guide subsequent eye movements . The moving image is impaired by flicker, even flicker at very high frequencies and low modulation depths. 30% amplitude modulation at 120Hz (as from fluorescent lamps) is known to impair visual performance. The 30% limit does not sufficiently protect health, although it is better than nothing.	The code language has been reverted to 2019 requirements based on the stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238629
238629.003	Professor Arnold Wilkins (University of Essex, UK)	3.The publication of flicker test results (of and from manufacturers) would incentivize healthy lighting.	The code language has been reverted to 2019 requirements based on the stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238629
238629.004	Professor Arnold Wilkins (University of Essex, UK)	4.There is a need for more restrictive flicker standards. It is now known that some individuals can see flicker as a fleeting pattern during a rapid eye movement (saccade) and some can see the pattern at flicker frequencies as high as 11KHz. The study indicates a raising possibility of a causal relationship between eye-strain and very rapid flicker.	The code language has been reverted to 2019 requirements based on the stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238629
238629.005	Professor Arnold Wilkins (University of Essex, UK)	5.The changes envisaged are major and have not been subject to the detailed analysis and public review that has occurred with other major changes.	The code language has been reverted to 2019 requirements based on the stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238629
238629.006	Professor Arnold Wilkins (University of Essex, UK)	6.The rationale for the changes in the initial statement of reasons does not evaluate the ramifications of the change. Careful evaluation should take place next code cycle.	The code language has been reverted to 2019 requirements based on the stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238629

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238632.001	Professor Lorne A. Whitehead (University of British Columbia)	1.The IEEES 1789-2015 standard, "Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers", is completed, and for the 120 Hz frequency commonly associated with inadequate filtering of AC power supplies, the IEEE recommendation to limit risk is to control amplitude modulation to no more than 10%. In comparison, Title 24's maximum allowable amplitude modulation is 30% or three times higher than what the IEEE recommends for limiting health risk.	A number of flicker standards are in existence but none of them have been deemed as the gold standard - they all have shortcomings including the IEEE 1789. Highlights of shortcomings of the IEEE 1789-2015 are as follows. (Source: NEMA 77-2017 document) First, the IEEE 1789 recommendations could be unnecessarily strict. Second, it does not treat light sources with different duty cycles differently. Third, it lacks application-specific limits in the IEEE Recommendations. It appears more work has to be done to produce an acceptable flicker standards for the lighting industry. Without an acceptable standards, it is premature and imprudent to introduce a new acceptance criteria to the Code.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238632
238632.002	Professor Lorne A. Whitehead (University of British Columbia)	2.Exempting Title 20 general service lamps from JA8 performance disclosure and labelling would render JA8 obsolete for this entire large class of lamps used frequently in residential new construction. Given the relatively fast turnover of lighting products, JA8 database entries for general service lamps would become rapidly out of date and the benefits of product performance disclosure would be lost. With an uneven set of requirements for JA8 labelling there is a question of whether building enforcement would be looking for the JA8 mark at all.	The 45-day language about Title 20 general service lamps in Table 150.0-A and Table 160.5-A has been deleted from the 15-day language. The proposed requirements of Section 150.0(k)1 and Section 160.5(a)1B have been revised back to the 2019 Code language. Also the proposed requirements of Table 150.0-A and Table 160.5-A have been revised back to the 2019 Code language.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238632
238632.003	Professor Lorne A. Whitehead (University of British Columbia)	3.What has been proposed in regard to residential lighting quality is a significant change. This should have the same level of preparation and scrutiny as was undertaken during the 2016 standards when the major revisions to the residential lighting standards were adopted. I recommend that the Commission not make the changes to Tables 150.0-A and 160.5-A this code cycle and consider next code cycle what options protect the quality of the visual environment while saving energy.	The following proposed requirements of Section 150.0(k)1 and Section 160.5(a)1B have been revised back to the 2019 Code language. Screw based luminaires shall contain lamps that comply with Joint Appendix JA8. The following proposed requirements of Table 150.0-A and Table 160.5-A have been revised back to the 2019 Code language. Indoor LED light sources except inseparable solid state lighting luminaires containing colored light sources providing decorative lighting (this is existing provisions of 2019 Energy Code), have to meet JA8 requirements.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238632
238637.001	Lauren Cullum (Sierra Club California)	Sierra Club California has concerns about weakening of the JA8 residential high efficacy lighting labelling requirements in the standard. Instead of rolling back these standards the Commission should be considering how to make these standards more protective, not less.	The scope of application pertaining to JA8 were reverted to 2019 requirements based on stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238632
238637.002	Lauren Cullum (Sierra Club California)	The proposed is not a simple "clean-up" or clarification of the proposed standards but a significant weakening of the residential lighting standards that is not in the public interest. Replacing the testing, disclosure and labelling requirements in JA8 with the less stringent Title 20 lamps standards that do not require flicker level disclosure or labelling is not equivalent, it is less protective.	The testing, disclosure and labelling requirements in JA8 are staying in the 2022 Energy Code - there were no modifications to the JA8 requirements in the 2022 Energy Code. Based on stakeholders' comments in this rulemaking and the fact that there is insufficient evidentiary data available at this time to support the proposed changes for certain types of LED light source to be qualified as high luminous-efficacy light sources by default, Staff recommend to revert the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238632
238637.003	Lauren Cullum (Sierra Club California)	We recommend the JA8 data - with close to 10,000 products - be analyzed and the results considered on whether the current Title 24 required flicker value should be dropped to a more protective value.	The proposal to drop the required flicker value is not part of the scope of this rulemaking. Staff will consider this change for the 2025 cycle.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238632

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238637.004	Lauren Cullum (Sierra Club California)	The current proposal for 2022 would be even worse as it would apply to all Title 20 general service LEDs which covers some LED lamps but not others and would similarly undermine the JA8 high efficacy standards.	The scope of application pertaining to JA8 were reverted to 2019 requirements based on stakeholders' comments.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238637
238637.005	Lauren Cullum (Sierra Club California)	We recommend that the CEC remove these harmful changes to Table 150.0-A, Table 160.5-A, Section 150.0(k)1B and Section 160.5(a)1B.	Staff thank the comment. The following proposed requirements of Section 150.0(k)1 and Section 160.5(a)1B have been revised back to the 2019 Code language. Screw based luminaires shall contain lamps that comply with Joint Appendix JA8. The following proposed requirements of Table 150.0-A and Table 160.5-A have been revised back to the 2019 Code language. Indoor LED light sources except inseparable solid state lighting luminaires containing colored light sources providing decorative lighting (this is existing provisions of 2019 Energy Code), have to meet JA8 requirements.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238637
238637.006	Lauren Cullum (Sierra Club California)	Additionally, we request again that for the next code cycle the Commission carefully evaluate the current consumer protections in JA8 and include all interested parties in the evaluation how these can be updated based on the latest science on human health and energy efficiency.	Staff has not yet started next code cycle work and could not comment on future as it is premature. Also, it is outside this rulemaking scope to respond to request outside of this scope.		45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238637
238658.001	Professor Michael Siminovitch (CLTC of UC Davis)	The proposed changes to JA8 (Title 24 residential) related to lamp quality and flicker specifications should be put off to the next round Title 214-2024 so that a more detailed public review and process can be achieved.	In the 15-day Express Terms, there are no proposed changes to JA8 related to lamp quality and flicker specifications.	7/2/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238658
238658.002	Professor Michael Siminovitch (CLTC of UC Davis)	The industry has made tremendous progress relative to lighting quality and there are a lot of products that currently meet or exceed the JA8 specification for residential. We fear the potential for unintended consequences in removing or modifying JA8.	The scope of application pertaining to JA8 were reverted to 2019 requirements based on stakeholders' comments.	7/2/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238658
238658.003	Professor Michael Siminovitch (CLTC of UC Davis)	We are supportive of recommendations and modifications that would further strengthen JA8 requirements for even higher quality products. This is certainly achievable given that industry is more than able to comply with the existing JA8 standard.	No proposals to strengthen JA8 requirements were provided. The scope of application pertaining to JA8 were reverted to 2019 requirements based on stakeholders' comments. Staff will revisit this for the 2025 code cycle.	7/2/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238658

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238664.001	Powertree Services Inc	First, we want to applaud the Commission for bringing and extending these requirements to multi-family properties which house over 42% of California's population and vehicles and are responsible for a commensurate amount of energy consumption. Setting a minimum standard will not only improve the health and living conditions of residents and neighbors but also provide a lower cost of living AND build wealth for the property owner while also encouraging existing properties to upgrade as well to remain competitive. For example, in Napa and Santa Rosa, California, one owner of over 200 apartments is currently installing, solar, storage and EV charging to cut tenant's energy bills, enable them to have access to at home EV charging and enable resiliency by supplying backup power. The services are opt-in to the tenants and will save the tenants at least 10% compared to other energy supplies AND save approximately 50% compared to the cost of gasoline while concurrently generating additional rental income for the property owner and seeing a net positive equity impact (equity increase minus cost of system and labor) in year 2, cash flow positive position in the same year and full cash payback by year 7.	Thank you for the comment	7/2/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238664&DocumentContentId=72043
238664.002	Powertree Services Inc	Second, concern has been expressed by other commenters that because there's a low percent penetration of these technologies that we should wait before acting to increase the penetration. This is a strange proposition as one might reasonably be concerned about efficacy or performance prior to any market offering but even a comparatively low % in a market as large as California is completely adequate to evaluate the performance and efficacy of technology such as energy efficiency, solar PV and energy storage.	Thank you for the comment	7/2/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238664&DocumentContentId=72043
238664.003	Powertree Services Inc	Third, we do agree that the CEC needs to invest in and encourage more work to expand the use of direct, local renewable power in the multi-family sector, which has been held back by market factors now being addressed in industry and lack of supporting regulation. The proposed expansion is one much needed step in the right direction of equity for ALL Californians in the fight against climate change and sustainable economic growth.	Thank you for the comment	7/2/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238664&DocumentContentId=72043
238664.004	Powertree Services Inc	Fourth, concerns have been expressed that market supply may not be adequate to meet the demand requirement from CEC action. We do not agree with this as while there is some lead time to systems, we have not experienced a lack of adequate supply. One key point on these "concerns" is basic economics in that not establishing a demand is not the way to get the market to enable supply.	Thank you for the comment	7/2/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238664&DocumentContentId=72043

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238664.005	Powertree Services Inc	Fifth, concern has been expressed about the fact the supply needs to be sourced from overseas locations. This is a factor in EVERY aspect of the California economy and no more so for energy storage and PV than other electronics. Further, having domestic demand will drive demand for more domestic manufacturing as domestic logistics cost and support are much more cost effective than international. The CEC enabling additional demand will only improve the domestic demand and bring ecological and economic benefits to local communities. For example, Powertree's equipment is designed and manufactured in California with local component suppliers and installers throughout the State.	Thank you for the comment	7/2/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238664&DocumentContentId=72043
238664.006	Powertree Services Inc	Sixth, other commenters have expressed concerns that economics work only in "off-grid" buildings which is typically the least cost-effective scenario as it typically requires 2 to 3 days' worth of battery and backup fueled generation. This idea that only off-grid should have PV + Storage is just not true as 100% of our projects have some form of grid tie. Further, assuming a limited set of battery use profiles as the other commenters have presented, is an inaccurate presentation of viable offerings possible and we wish to highlight that several uses of multi-family PV and storage have not been discussed including; Reducing service upgrade requirements for EV, reducing new construction service costs by enabling more efficient use of shared EVSE at higher power levels, in- building resiliency for tenants, reducing energy use through self-consumption by tenants on-site AND for EV charging. Off peak charging of grid battery for peak use mentioned by some commentors is just one scenario amongst many viable uses. We are happy to participate in more detailed discussion of the sizing requirements if desired.	Thank you for the comment	7/2/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238664&DocumentContentId=72043
238664.007	Powertree Services Inc	Seventh, comments have been made that "only costly 3rd Party VNEM solutions will be available when the code updates go into effect". In addition to our own non-NEM solutions we are aware of multiple companies offering multi-family solutions today, some with VNEM and some with hardware enhancements to NEM. As we mentioned above, we see 10,000s of apartments being enabled in projects being deployed today and any learning curve is relatively short for installers and developers when they involve the suppliers of these systems. The economics on these systems, especially in multi-family where the equity valuation of a property is a multiple of rental incomes, are quite attractive in that the systems are often net equity positive in just a couple of years. New builders will, we think, find that providing solar PV, EVSE and ESS will be profitable for them and necessary.	Thank you for the comment	7/2/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?n=238664&DocumentContentId=72043

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238664.008	Powertree Services Inc	Finally, we have observed in negotiations on new build projects that the current mandates can impose perverse incentives on builders. An example that needs correction is in the current Title 24 (Section 6) mandate wherein the idea of a make-ready requirements based on the CARB new ZEV sales %. The issue here is that at 30 (or 50 amps) per parking stall this can create a very large requirement for grid capacity that can make a project un-attractive. As a result of the make-ready exemption these projects may enable the capacity but not actually place wire or active EVSE in the project. Without the EVSE being present there is little to no confidence by tenants that they can charge their vehicle and the property may wind up just re-using or re-allocating that grid capacity for non-EV purposes. This is especially true in larger projects. We suggest modifying this requirement to require (a) that EVSE be shared use at the current industry average charge rate of 50 amps AC with at least 6 vehicles be supported per shared use stall (as current vehicles have ranges enabling a weeks' worth of driving and so need a charge only once or week or slightly more) and (b) that the shared use EVSE be installed and operational. For example, a 480 parking stall project with a 25% CARB level would need to support 120 VEHICLES (not stalls) and at 6 vehicles per shared stall this is 20 stalls needing to be equipped. So rather than needing 30 amps x 120 stalls = 3600 Amps of capacity (864KW) under the current rules the Builder would need only 20 x 50 Amps = 1000 Amps (240KW). A savings of 2600 Amps (624KW) for the same or greater electric vehicle miles deliverable. This	Thank you for your comment. The concerns raised here pertain to a different rulemaking under the jurisdiction of another agency, and are outside the scope of this proceeding. The California Air Resources Board is the lead agency for EVSE. Staff encourages stakeholders to reach out to CARB and participate in that proceeding..	7/2/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238664&DocumentContentId=72043
238670.001	EnergySage	EnergySage is writing to express strong support for the solar and storage requirement for new commercial buildings. Solar and storage are the essential building blocks required to meet California's clean energy and emission reduction targets. Commercial buildings are an ideal venue to site these resources to both avoid greenfield development, as well as to meet demand for electricity exactly where it exists.	Staff appreciate the support.	7/2/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238670&DocumentContentId=72052
238693.001	ConSol	When considering the data from Rheaia's tests, the studies noted here, submissions to the docket from builders experienced in the use of uninsulated ducts (TN#s 238321, 238267, 238263, 238261, 238258, 238239, and 238212), and ConSol's previous comments submitted to this docket (TN#s 238140 and 238388), it remains ConSol's position that the requirement for insulation on ducts in conditioned space is unnecessary and should not be included in the 2022 code.	The approved 15-day 2022 Standards removes the R-4.2 requirement and allows no insulation on ducts located in conditioned spaces that meets a certain criteria, which is in alignment with what this comment is proposing. The revision encourages builders to relocate duct systems which includes the air handler from an unconditioned space, typically a vented attic, into the building's thermal envelope.	7/5/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?fn=238693&DocumentContentId=72077

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238696.001	Jon McHugh (McHugh Energy)	1.(Public process:) The comment cast a concern that the pre-rulemaking text about the changes in residential lighting and JA8 is a surprise to some commenters and therefore it is an unexpected change. A similar comment also cited the lack of advance notice about the proposed changes.	The comment is well-taken even though a significant effort has been carried out by the Commission to keep the public informed about the proposed code changes in the public participation process. A pre-rulemaking text document showed the intended or the proposed changes was provided for public view well before the commencement of the rulemaking and there was ample of time for those who were interested to view the changes before the rulemaking. During the rulemaking, public can view the proposed changes again and also comment on the changes - during the 45-day and during the 15-day period. There were three periods of time that the public can participate in the proposed code changes - after the posting of the pre-rulemaking text document but before rulemaking; during the 45-day Express Term period, and during the 15-day Express Term period.	7/6/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238696
238696.002	Jon McHugh (McHugh Energy)	2.(Public process:) The comment states that proposed changes to Table 150.0-A, Table 160.5-A, Section 150.0(k)1B and Section 160.5(a)1B is a significant reduction in stringency and consumer protection in the residential lighting standards, and this would require a well documented proposal and sufficient opportunity for detailed public engagement.	The comment critiqued the proposed changes to Table 150.0-A, Table 160.5-A, Section 150.0(k)1B and Section 160.5(a)1B and entails a significant reduction in stringency and consumer protection in the residential lighting standards. Staff do not agree that there is a reduction in consumer protection as the scope of Energy Code does not hinge on consumer protection but rather ensuring cost-effective and feasible energy-efficient installations in buildings. However, staff do agree that the flicker reduction performance requirements should apply to LED sources including those affected by the proposed changes. As such, staff recommends to revert the affected portion to the 2019 language so that the JA8 requirements would apply to LED light sources except LED light sources installed outdoors and inseparable SSL luminaires containing colored light sources installed for decorative lighting.	7/6/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238696
238696.003	Jon McHugh (McHugh Energy)	3.(Flicker effects:) The exempting Title 20 general service lamps to the JA8 requirements would result with negative impacts to visual quality and health due to flicker effects of lighting - as commented by Dr. Arnold Wilkins, Univ. of Essex.	The comment cites likely negative impacts to visual quality and health due to flicker effects of lighting. Regarding to flicker effects and the JA8 flicker reduction requirements, staff agree that the JA8 flicker test should be applicable to LED lamps and light sources except those already exempted in the current code - those include LED light sources for outdoor and those inseparable solid state lighting (SSL) luminaires containing colored light sources. Regarding the code changes to the proposed light sources to be considered as high luminous efficacy by default, staff determine that there is lacking evidential data at this time to support the proposed Title 20 general service lamps to be considered as high efficacy and thereby be exempted from flicker reduction requirement, and staff conclude that the proposed Title 20 general service lamps should meet the JA8 qualifications requirements.	7/6/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238696

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238697.003	Jon McHugh (McHugh Energy)	4.(JA8 marking:) The comment suggests the JA8 requirements could be less enforceable as building enforcement may not be looking for JA8 mark at all.	<p>There were no proposed changes to the JA8 labeling requirements and therefore staff do not expect the JA8 labeling requirements or the installation requirements related to JA8 to be less enforceable.</p> <p>However in some unlikely scenario of someone who may obtain a non-compliant with Title-20 lamp product and the person claims it to be a Title 20 compliant lamp during an inspection process. California laws require all general service lamp products sold in California to meet the Title 20 Appliance Efficiency Regulations for general service lamps. The above scenario may be confusing during building enforcement for the proposed code changes.</p> <p>Staff determine that there is lacking evidential data at this time to support the proposed light sources to be considered as high luminous efficacy source by default and staff conclude that the proposed light sources should meet the JA8 qualifications requirements. As such, staff recommend to revert the language so that the proposed light sources shall meet the JA8 qualification requirements, and this would effectively revert the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.</p>	7/6/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238696
238704.001	Amanda Bancroft	As a supporter of Mothers Out Front, 350 Silicon Valley and a California resident, I urge you to adopt an all-electric code for new construction beginning in the 2022 code cycle. An incremental approach is completely inadequate to address the public health and climate crises. We need you to act swiftly to protect our health, safety, and climate and promote equity by ensuring that new buildings do not perpetuate the use of fossil gas infrastructure	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/6/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238704&DocumentContentId=72098
238704.002	Amanda Bancroft	<ul style="list-style-type: none"> • Health: The use of gas appliances, particularly gas stoves, degrades indoor air quality and harms health. Children living in homes with gas stoves are 42% more likely to experience symptoms of asthma. • Safety: Gas is a leading cause of structure fires, burns, and carbon monoxide poisoning, causing half of all fires post earthquakes. • Climate: Fracked gas releases methane at every step of the production cycle, making "natural" gas more destabilizing to the climate than coal. • Equity: Communities of color and low-income communities are disproportionately harmed by the extraction and storage of gas as well as the combustion of gas in the home, leading to inequitable health outcomes and increased mortality from COVID-19. 	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/6/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238704&DocumentContentId=72098
238704.003	Amanda Bancroft	There is no justification for continuing to build with dangerous and destabilizing gas when affordable and highly efficient electric appliances are readily available, including induction cooktops and heat pumps. The market is ready, it just needs a clear signal from the CEC.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/6/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238704&DocumentContentId=72098

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238713.001	Robert Raymer/CBIA	CBIA applauds the CEC for allowing ducts in conditioned space without insulation. There are promising technologies adopted by production builders in other states that move ducts into conditioned space. The current 45-day language allows an Exception for the proposed R4 below deck insulation, if all ducts and the air handler are placed in conditioned space. However, the requirement for ducts and air handlers in conditioned space is of concern because less than 1% of the production builder market installs the air handler in conditioned space. Most air handlers are installed in the attic which the industry realizes is not the best for energy efficiency.	Staff removed the requirement for insulation on ducts fully within the conditioned space, consistent with the commenter's request. Staff does not find that additional allowance for locating air handlers in attic spaces to be consistent with the goal of reducing heat exchange between unconditioned spaces and conditioned indoor air. Staff notes that the adopted regulations do not force the air handler to be in a certain location; it instead provides alternatives (exceptions). The adopted language is intentional in encouraging builders to relocate duct systems, inclusive of air handlers, from unconditioned spaces (typically a vented attic) into the building's thermal envelope. Staff therefore determined that implementing the commenter's requested change relating to air handlers would not be appropriate.	7/7/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?en=238713&DocumentContentId=72110
238713.002	Robert Raymer/CBIA	For the 2022 Standards, a more gradual approach that places the supply ducts in the conditioned space while the air handler remains in the attic will encourage the market to install ducts in conditioned space and allow the market to make a transition to ducts and air handlers in conditioned space in the future. A gradual transition based on this approach and possible cost savings will move the market over the next code cycle. Assuming the HVAC equipment has a significant market share (> 20%) CBIA would support the requirement for ducts in conditioned space to require the air handlers to also be in the conditioned space.	Staff removed the requirement for insulation on ducts fully within the conditioned space, consistent with the commenter's request. Staff does not find that additional allowance for locating air handlers in attic spaces to be consistent with the goal of reducing heat exchange between unconditioned spaces and conditioned indoor air. Staff notes that the adopted regulations do not force the air handler to be in a certain location; it instead provides alternatives (exceptions). The adopted language is intentional in encouraging builders to relocate duct systems, inclusive of air handlers, from unconditioned spaces (typically a vented attic) into the building's thermal envelope. Staff therefore determined that implementing the commenter's requested change relating to air handlers would not be appropriate.	7/7/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?en=238713&DocumentContentId=72110
238713.003	Robert Raymer/CBIA	CBIA urges the CEC to adopt 15-Day language that allows uninsulated ducts in conditioned space with air handler in the attic as an off-ramp for the proposed R4 below deck insulation for the 2022 cycle of Standards.	Staff removed the requirement for insulation on ducts fully within the conditioned space, consistent with the commenter's request. Staff does not find that additional allowance for locating air handlers in attic spaces to be consistent with the goal of reducing heat exchange between unconditioned spaces and conditioned indoor air. Staff notes that the adopted regulations do not force the air handler to be in a certain location; it instead provides alternatives (exceptions). The adopted language is intentional in encouraging builders to relocate duct systems, inclusive of air handlers, from unconditioned spaces (typically a vented attic) into the building's thermal envelope. Staff therefore determined that implementing the commenter's requested change relating to air handlers would not be appropriate.	7/7/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?en=238713&DocumentContentId=72110

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238722.001	Jim Purekal, on behalf of SunPower	First, there is a belief that the battery storage requirement for non-residential buildings is too far ahead of its timeframe in the face of current supply shortages. While we recognize that some commercial customers face a supply shortage for batteries today, we should remember that the mandate will not go into effect until 2023 and that battery manufacturing capacity is expanding. We expect the supply constraints of 2021 to be significantly mitigated by 2023, in time to face the growth in demand. SunPower sees significant investment from our manufacturer and integrator partners in building more battery factories and more manufacturing capability. In addition, SunPower has lined up long-term supply to fulfill our 2022 and 2023 customer needs.	Thank you for the comment	7/7/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238722&DocumentContentId=72122
238722.002	Jim Purekal, on behalf of SunPower	Second, there is an assertion that PV and battery storage do not necessarily work together unless you have an off-grid building that needs to rely on PV for standard power. The point can be easily refuted as SunPower has installed or is in the process of installing 51 energy storage systems paired with PV systems for commercial customers in California, and none of them are being installed at off-grid buildings. Just to name one example, SunPower is currently installing a 5.5 MW PV rooftop coupled with a 1.5 MW / 6 MWH energy storage system located in Bakersfield, CA and interconnected to Pacific Gas & Electric. The system is forecasted to deliver over \$440K in bill savings and reduce the impact of green-house gas (GHG) emissions by more than 178,000 kg CO2 – all in the first year of operation. In another use case, SunPower has installed a 2.5 MW PV carport with a 2 MW / 4 MWH storage system in Santa Clara under an interconnection with Silicon Valley Power. The combined system reduces the customer's load during high price hours and reduces Silicon Valley Power's power procurement costs.	Thank you for the comment	7/7/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238722&DocumentContentId=72122
238722.003	Jim Purekal, on behalf of SunPower	Finally, to the point that virtual net metering (VNEM) projects will only be available through expensive third-party solutions upon implementation of the code updates, it should be known that VNEM is widely available throughout the state in all three investor owned utility service areas and several of the larger municipal service areas. The VNEM projects are cost effective with low barriers to entry and should not pose a problem for energy generation.	Thank you for the comment	7/7/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238722&DocumentContentId=72122

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238767.001	Donald E Osborn	<p>There have been some misconceptions raised about VNEM in California by the CBPA and others that, while I know you and the CEC staff understand these misconceptions, I would like to address based on our long, in-the-field experience with VNEM projects. Spectrum has completed or is in the process of completing some 44 VNEM projects for multi-family housing throughout California, about 80% of these are for affordable housing and the rest for market rate housing. With the new T-24 PV requirements we are seeing a substantial pick up in the market rate sector. VNEM is well established with the CPUC regulated utilities that represent most of the state as well as with a few of the "munis". VNEM clearly reduces costs and improves benefits for the multi-family housing sector. It is well established and works well. There are no "costly 3rd Party VNEM solutions" needed to apply VNEM. VNEM's implementation is broad, well established and operates well. There is NO lack of "practical experience" with VNEM.</p> <p>VNEM works and is providing significant savings to the customers who need access to solar benefits most. It is a strong part of the solar mix that is helping meet State Climate goals while providing real benefits to customers across the State. Spectrum, and the community of solar providers, already work with a wide range of multi-family providers, developers and builders and stand ready to continue to do so. VNEM is central to meeting State goals in cost-effective ways and to making the benefits of solar more broadly available. VNEM applied to</p>	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238767&DocumentContentId=72170
238768.001	Sun Light & Power	<p>We wholeheartedly support the leadership of the CEC in mandating changes in our California Energy Code that will lead this state and this country towards reversing the Climate Change that is threatening all life on this planet. It is time for bold action to eliminate the burning of fossil fuels, and we strongly recommend that the Commission not embrace the timid suggestions of entities like the CBPA that will lead to half-hearted, ineffective stutter-steps.</p>	Thank you for the comment of support	7/9/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238768&DocumentContentId=72172
238768.002	Sun Light & Power	<p>Contrary to the claims of the CBPA, I am confident that the markets (heat pumps, batteries, and the like) will continue to respond robustly to market forces, as I have seen markets do many times over the last 45 years, when a clear mandate is provided. I also find many of CBPA's claims to be factually challenged; for example, their statement that "PV and battery storage do not necessarily work together unless you have an off-grid building" is nothing short of baffling, especially since I have successfully installed hundreds of grid-tied battery systems for over the past 20+ years. And their other comments about battery usage at night reveal a fundamental lack of understanding of how a battery system is designed to work.</p>	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238768&DocumentContentId=72173

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238768.003	Sun Light & Power	With respect to VNEM, CBPA claims that VNEM is "developing", which is to me another baffling statement, given that SLP installed our first VNEM project in 2011, and has contracted for over 60 VNEM projects since then, totaling 3.7 MW. One of our first non-profit affordable housing VNEM customers, EAH Housing, has projected that their 5 MW of solar installations will save their low-income tenants over \$20 million in energy costs over the next 20 years, allowing EAH to plow those savings back into reduced rental costs, improved facilities and services like computer training for tenants.	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238768&DocumentContentId=72171
238770.001	ENGIE NA	We write in strong support for the solar plus storage mandate for new commercial buildings. Solar paired with storage is pivotal towards meeting California's 100% clean energy goals by 2045 as this goal cannot be achieved without new investments in a variety of distributed energy resources. Solar paired with storage will allow commercial customers to shift solar output to serve loads in costly peak hours which will significantly increase the value of the customer's solar investment through energy bill savings while providing significant benefits to the electric grid.	Thank you for the comment of support	7/9/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238770&DocumentContentId=72172
238770.002	ENGIE NA	Further, to meet the challenges associated with climate change, customers are increasingly requesting solar and storage systems to improve resiliency, where significant electricity can be produced and stored on-site and systems can island from the grid when grid power is lost. Increasing resiliency will be an imperative for commercial customers in the future that rely on continuous electric service.	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238770&DocumentContentId=72172
238770.003	ENGIE NA	Concerns have also been raised about the battery supply chain. ENGIE is currently experiencing a lead time for battery systems of 9 to 12-months. While this does require planning ahead, this is not a showstopper by any means and experienced developers/installers are well versed in managing projects around these constraints. In addition, the 100MW/400MWh of storage annually that is estimated to result from this mandate would have minimal impact on supply considering the forecasted size of the industry.	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238770&DocumentContentId=72172
238781.001	Invinity Energy Systems (US) Corporation	CPBA begins by asserting that "battery systems are not widely available at present". The evidence showing hundreds of deployments across California in the last 10 years disproves this point. Many different storage technologies (lithium ion, flow batteries, and others) supplied by dozens of manufactures and sold and installed by hundreds of project developers and EPCs in California every year. Many studies document the rapid growth of energy storage installations in the United States. The US Energy Information Administration recently reported energy storage deployment growth of 40% each year from 2010 through 2018.	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?hc=238781&DocumentContentId=72186

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238781.002	Invinity Energy Systems (US) Corporation	CBPA then posits that “the market supply of energy storage is “constrained by rapidly increasing demand in the transportation sector”. The reality is exactly the opposite. Manufacturers supplying lithium ion batteries to the automotive market, such as Tesla, have used demand in the automotive sector to support the very growth referenced in the EIA study above. Meanwhile, advanced battery storage technologies are increasingly available.. For its part, over the next three years Invinity expects to increase our annual manufacturing throughput to over 200 megawatt-hours per year, a 10x increase over our current manufacturing capacity.	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238781&DocumentContentId=72186
238781.003	Invinity Energy Systems (US) Corporation	Finally, CPBA observes that supply is almost exclusively reliant on imported products and foreign material extraction. CBPA overlooks that fact that the USA has ample reserves of these materials but until now lacked the capacity to extract and refine them to the level of purity required for energy storage applications. This is already changing. General Motors (a Tesla competitor) has just announced plans to extract lithium from a huge deposit in the Salton Sea in Southern California2 . In a similar move, Invinity is now working with domestic vanadium suppliers in collaboration with the US Department of Energy to ensure domestic sources of materials are available to support our continued growth.	Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238781&DocumentContentId=72186
238781.004	Invinity Energy Systems (US) Corporation	Together, these misconceptions indicate to Invinity that CBPA perceives a misalignment of mandates and market supply that could have a negative effect on new construction and that the CEC is unprepared for the potential of such an outcome. Having observed the trajectory of the California solar industry, Invinity feels exactly the opposite: that the CEC is following a now proven formula for encouraging the beneficial evolution of energy markets by encouraging the widespread adoption of mature but transformative technologies. In the solar industry, we witnessed how the adoption of prudent market incentives established a stable, attractive market, which then became self-sustaining through the efforts of competing suppliers. Invinity believes the proposed changes to the California Energy Code, promoting adoption of ESS for certain commercial buildings, will deliver similarly successful results.	Thank you for the comment of support.	7/9/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238781&DocumentContentId=72186
238797.001	CA Solar & Storage Association	As the Commission continues the process to adopt a PV requirement for new commercial and high-rise multifamily buildings, we are submitting the attached spreadsheet to the docket as a resource to aid the Commission in its decisions. The data are the virtual net energy metering (VNEM) projects interconnected in PG&E, SCE, and SDG&E between January 2020 and April 2021. The data show that VENM is a well established program that allows multi-tenant properties to install solar. Both commercial and residential solar properties across the state already rely on VNEM, and nearly 40 solar companies have a recent history of providing VNEM services. The data also show that while the majority of VNEM solar projects are owned by the property owner, a significant portion of the projects are also owned by third parties.	Note that spreadsheet is included in TN 238798 Thank you for the comment	7/9/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=238797&DocumentContentId=72200

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238811.001	Russell King, M.E.	<p>1. The building types that fall under the MF sections of the code. (e.g., low rise multifamily)</p> <p>2. The tests that HERS raters are trained to do and have been doing for many years (e.g., testing HVAC and IAQ of systems serving individual dwelling units, regardless of number of stories)</p> <p>3. The triggers for and importance of certain protocols in the Nonresidential Appendices (e.g., NA7.18.1.2.2 is a blower door test that is only triggered when non-balanced IAQ ventilation is installed in an individual dwelling unit. This section should NOT be removed.)</p> <p>HERS Raters have been performing important verifications on low rise multifamily buildings and high rise multifamily dwelling units for several code cycles. HERS Registries can already accommodate these types of verification to ensure that the appropriate protocols are applied and allow for streamlined enforcement by building departments through use of the Project Status Report. HERS Raters and HERS verifications serve a very specific and distinct role in safeguarding code compliance and are not duplicative of the ATTCP requirements. The combining of high-rise and low-rise multifamily buildings in the code is obviously causing confusion about the specific responsibilities. This confusion underscores the need to continue to have experienced HERS raters perform these tests.</p>	Thank you for your comment.	7/12/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238811&DocumentContentId=72215
238811.002	Russell King, M.E.	<p>1. There is no conflict with 160.3(c)3B, which does not involve test methods. 160.3(c)3B simply states when a MATT needs to be a CMATT.</p> <p>2. NA7.18.1.1.2 applies to IAQ fans serving individual dwelling units, which are exactly the same as IAQ fans serving single family homes. HERS raters are specially trained and are qualified to perform these tests and have been testing these systems for years.</p> <p>3. The NA7.18.1.2.2 blower door test is necessary to ensure that air is not exchanged between dwelling units when a non-balanced IAQ system is used. It should not be removed. Furthermore, HERS raters are perfectly qualified to perform blower door testing on individual dwelling units. We are not aware of blower door testing being covered in any ATTCP training.</p>	Thank you for your comment.	7/12/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238811&DocumentContentId=72215
238811.003	Russell King, M.E.	<p>NEMIC comment: "To avoid confusion in the field and appropriately address Multifamily Building concerns, HERS NA7.18.1.1.2 and NA7.18.1.2.2 should be removed. NA7.18.1, NA7.18.2, NA7.18.3 and NA7.18.4 workforce standards requirements should be limited to an MATT."</p> <p>Our reply: Their reasoning for this suggestion is flawed, due to the inaccuracies as shown above. It should be disregarded.</p>	Thank you for your comment.	7/12/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238811&DocumentContentId=72215

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238855.001	SimpliPhi Power, Inc.	<p>Without energy storage, renewable generation is intermittent, but so too is the grid during catastrophic and emergency scenarios in which the centralized delivery of power breaks down.</p> <p>Whether power outages are planned (PSPS events) or unplanned, the only way to create resilience for homes and businesses is to install distributed back-up energy storage + solar that is customer sited, in buildings and on rooftops. California continues to lose billions of dollars in a matter of weeks due to grid failure and power outages. Grid-tied distributed back-up energy storage + solar installed in apartment and multi-family buildings, homes, businesses, schools, and hospitals create energy security and economic stability, eliminate the 'duck-curve' due to overproduction of solar during the day (battery storage), optimize grid functions and antiquated infrastructure, and save families and commercial property owners hundreds, sometimes thousands of dollars a month through TOU, peak shaving and demand charge management.</p> <p>SimpliPhi Power can provide ample evidence across commercial project installations that demonstrate the 'value stack' of distributed customer-sited grid-tied storage + solar and the tangible economic benefits to building owners, their tenants and CA at large as distributed, customer-sited assets increase resilience and decrease CO2 and other GHG emissions in the built environment. We would welcome an opportunity to</p>	An updated comment was submitted as 238884. Thank you for the comment.	7/13/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238855&DocumentContentId=72293
238860.001	Unico, Inc.	<p>Single Family Heat Pump Documentation</p> <p>Table 7 of the Single Family Heat Pump Documentation omitted other classes of products. Specifically it omitted small duct high velocity products (SDHV). These products are included in the market survey shown in Table 8 so it appears to be an oversight.</p> <p>Please correct table 7 to avoid confusion with California users who might believe that SDHV systems are prohibited because the SDHV SEER value is less than 14. SDHV systems are tested under different conditions so the SEER values are not derived the same way.</p> <p>It might be easier to just reference or copy the Federal rule, 10 CFR 432(c).</p>	SDHV systems can be used under the performance compliance path. SDHV system is not included in Table 7 but it has no material effect on the proposed heat pump baseline.	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238860&DocumentContentId=72262
238860.002	Unico, Inc.	Furthermore, Table 8 average efficiency columns are much higher than the data in the AHRI directory and appear to be the maximum technically feasible value. Changing the column heading to "Max Tech" would clarify the information, particularly for small duct systems.	Staff disagree with the comment. Table 8 represents a summary of average efficiency of actual installed systems in California meeting the 2019 code. It would be incorrect to label it "max tech"	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238860&DocumentContentId=72262

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238877.001	Enel X North America, Inc.	Enel X strongly supports the CEC's proposal to require PV and batteries at newly-constructed nonresidential and high-rise multi-family buildings. These resources have been successfully deployed at thousands of C&I sites throughout the state to provide customer bill management and promote consumption of locally-generated energy, including for back-up resiliency applications. More importantly, these resources can provide grid-facing services to bolster overall grid reliability and are poised to play an increasingly important part of California's energy supply as the state progresses to an 100% clean energy future under SB 100. The need for these resources is dramatically amplified against the backdrop of supply shortages and grid outages caused by increasing extreme weather events and wildfires.	The adopted standards apply to newly constructed buildings not equipment. Additionally, Prescriptive requirements only apply to buildings using the prescriptive path. A building using the performance path has additional flexibility in showing compliance. The record reflects that the adopted standards are cost effective as a whole.	7/14/2021	15-Day	https://efiling.energy.ca.gov/ETiling/GetFile.aspx?fn=2388778.DocumentContentId=72282
238877.002	Enel X North America, Inc.	Enel X wishes to respond to the following concerns expressed by the California Business Properties Association (CBPA) et al. in a letter dated June 21, 2021, that: <ul style="list-style-type: none"> • Battery systems are not widely available at present and constrained by supply chain issues; • Battery storage is not always practical for a lot of buildings, that PV and battery storage do not necessarily work together unless you have an off-grid building that needs to rely on PV for standard power, and that PV-stored power is uneconomic for C&I applications; and • Storing PV power should not be a default requirement, as peak load shedding usually happens when the PV system is at full operation, and that battery systems might be useful for using low-cost energy from the grid at night to supply the building during daytime and especially peak hours of operation to reduce maximum demand loads. 	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/ETiling/GetFile.aspx?fn=2388778.DocumentContentId=72282
238877.003	Enel X North America, Inc.	Enel X wishes to respond to the following concern expressed by the California Business Properties Association (CBPA) et al. in a letter dated June 21, 2021, that: <p>Battery systems are not widely available at present and constrained by supply chain issues. First, Enel X has not experienced supply chain issues affecting its current battery storage development pipeline and does not anticipate any in the foreseeable future. With proper lead-time planning as part of the project development cycle, any such residual concerns can be greatly mitigated.</p>	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/ETiling/GetFile.aspx?fn=2388778.DocumentContentId=72282

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238877.004	Enel X North America, Inc.	Second, we strongly refute the claim that solar PV paired with batteries only "works together" or makes economic sense for off-grid applications. The main value driver for most C&I solar plus storage applications at present is to minimize a grid-connected customer's electric bill, especially due to demand charges that are assessed on a customer's peak load in a given day or month (depending on the rate). The wide variety of customer and building types covered by the proposed requirements will entail an equally wide variety of load profiles and peak demand occurrences. It is not always the case that a customer's peak demand coincides with peak solar generation. Batteries charged from PV during the middle of the day can mitigate demand peaks that occur later in the afternoon or evening.	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238877&DocumentId=72282
238877.005	Enel X North America, Inc.	Ultimately, batteries paired with solar afford a high degree of flexibility to minimize a customer's energy costs, while also enabling value stacking with available grid service revenues. Co-located batteries are also important to maximize solar value given the shift in net peak load to late afternoon and early evening hours, and to mitigate against potential changes to NEM credits under consideration in the CPUC's NEM 3.0 proceeding. We note that the ability for the CEC Executive Director to approve Alternative Control strategies aside from those prescribed in Section JA12.2.3 (of Appendix JA12) will be an important element to ensure that battery operation can continually respond to changes in rates and demand response signals following the implementation of these standards.	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238877&DocumentId=72282
238884.001	SimpliPhi Power, Inc.	<p>Without energy storage, renewable generation is intermittent, but so too is the grid during catastrophic and emergency scenarios in which the centralized delivery of power breaks down.</p> <p>Whether power outages are planned (PSPS events) or unplanned, the only way to create resilience for homes and businesses is to install distributed back-up energy storage + solar that is customer sited, in buildings and on rooftops. California continues to lose billions of dollars in a matter of weeks due to grid failure and power outages. Grid-tied distributed back-up energy storage + solar installed in apartment and multi-family buildings, homes, businesses, schools, and hospitals create energy security and economic stability, eliminate the 'duck-curve' due to overproduction of solar during the day (battery storage), optimize grid functions and antiquated infrastructure, and save families and commercial property owners hundreds, sometimes thousands of dollars a month through TOU, peak shaving and demand charge management.</p> <p>SimpliPhi Power can provide ample evidence across commercial project installations that demonstrate the 'value stack' of distributed customer-sited grid-tied storage + solar and the tangible economic benefits to building owners, their tenants and CA at large as distributed, customer-sited assets increase resilience and decrease CO2 and other GHG emissions in the built environment. We would welcome an opportunity to</p>	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?m=238884&DocumentId=72293

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238884.002	SimpliPhi Power, Inc.	As a California manufacturer that founded in 2010, we have witnessed and have had to adapt and respond to changes in the regulatory landscape and have experienced firsthand the powerful impact mandates can have on the energy industry to drive change for the better. We applaud the CEC for developing the 2022 Building Energy Efficiency Standards and appreciate the opportunity to provide comment and support in favor of the Standards that would go into effect January 2023.	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238884&DocumentContentId=72293
238884.003	SimpliPhi Power, Inc.	<p>While there is concern about supply chain constraints that challenge the building industry's ability to meet the Energy Commissions estimated 100MW/400MWH of solar + storage annually, it is the vision behind mandates like this that serve as transformational signals to the market that promote the innovation, supply chain and increased production necessary to meet them.</p> <p>As example, during 2020 and the COVID shutdowns, demand for SimpliPhi's grid-tied energy storage solutions across residential, multifamily, and commercial applications increased by 40%, as compared to 2019 sales. While challenging for our company and our network of global suppliers to meet this rapid increase in demand, it was the market signal we needed to aggressively bolster our supplier network and secure robust supply agreements and contracts. To date this year, we have experienced an additional 20% increase in market demand for grid-tied energy storage and management solutions and continue to work in lockstep with our suppliers as we expand our operations and throughput capacity.</p> <p>Mandates serve to create concrete market signals that in turn support manufacturing operations and global supply chains to scale with reliable strategic forecasts adeptly and confidently, driving down costs and constraints. The Energy Commissions foresight in establishing the 2022 Building Energy Efficiency Standards will be a significant contributor to driving the market</p>	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238884&DocumentContentId=72293
238884.004	SimpliPhi Power, Inc.	Finally, it is critical that California enact policies and standards that reduce CO2 levels driving the extreme heat, drought, and wind - climate change - that are behind the planned power outages (PSPS) and unplanned grid failures, costing the state billions in losses annually. In 2020, it is estimated there were approximately 9,700 fires in California alone. Research indicates that the built environment is responsible for close to 33% of energy consumption and 30% of GHG emissions. The CEC mandate directly addresses these critical issues and provides a clear market signal for companies across the renewable and construction industries to build toward, leveraging innovation and supply chains with confidence.	Thank you for the comment	7/14/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238884&DocumentContentId=72293

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238930	Hellman & Lober Inc.	<p>Table 120 1-A Minimum Ventilation Rates for Hotel Guestrooms- 30 CFM per Guest room</p> <p>The 2016 and older versions of CEC includes the minimum ventilation rate of 30 CFM per guest room for a hotel with less than 500 sq. ft. area.</p> <p>The 2019 version of CEC removed this criteria which significantly affect the cost of building a hotel structure and increase energy consumption. The 2019 version uses 0.15 CFM per sq. ft. ventilation rate. Assuming a 500 sq. ft. hotel guest room, with this criteria the ventilation rate is 75 CFM per guest room compare to 30 CFM per guestroom. This doubled the ventilation rate requirement for each guest room. Assuming a hotel structure with 180 guest rooms, an additional of 8,100 CFM is required to meet the ventilation requirement. This means that the DOAS unit needs to be bigger and would mean more energy consumption. In addition, the floor to floor height of the building structure has to be increased in order to accommodate the larger CFM from DOAS unit.</p>	There were no changes made to this requirement in the 2022 update. To make a revision here to go back to 2016 requirements, a proposal will need to be submitted and considered for the 2025 update.	7/19/2021	15-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238930&DocumentContentId=72342
238930.001	Hellman & Lober Inc.	<p>Table 120 1-A Minimum Ventilation Rates for Hotel Guestrooms- 30 CFM per Guest room</p> <p>The 2016 and older versions of CEC includes the minimum ventilation rate of 30 CFM per guest room for a hotel with less than 500 sq. ft. area.</p> <p>The 2019 version of CEC removed this criteria which significantly affect the cost of building a hotel structure and increase energy consumption. The 2019 version uses 0.15 CFM per sq. ft. ventilation rate. Assuming a 500 sq. ft. hotel guest room, with this criteria the ventilation rate is 75 CFM per guest room compare to 30 CFM per guestroom. This doubled the ventilation rate requirement for each guest room. Assuming a hotel structure with 180 guest rooms, an additional of 8,100 CFM is required to meet the ventilation requirement. This means that the DOAS unit needs to be bigger and would mean more energy consumption. In addition, the floor to floor height of the building structure has to be increased in order to accommodate the larger CFM from DOAS unit.</p>	There were no changes made to this requirement in the 2022 update. To make a revision here to go back to 2016 requirements, a proposal will need to be submitted and considered for the 2025 update.	7/19/2021	15-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238930&DocumentContentId=72342
238935.001	Paliavi Pandit	As a supporter of Mothers Out Front and a California resident, I urge you to adopt an all-electric code for new construction beginning in the 2022 code cycle. An incremental approach is completely inadequate to address the public health and climate crises. We need you to act swiftly to protect our health, safety, and climate and promote equity by ensuring that new buildings do not perpetuate the use of fossil gas infrastructure.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/19/2021	15-Day	https://efiling.energy.ca.gov/Filing/GetFile.aspx?fn=238935&DocumentContentId=72342

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238935.001	Paliavi Pandit	As a supporter of Mothers Out Front and a California resident, I urge you to adopt an all-electric code for new construction beginning in the 2022 code cycle. An incremental approach is completely inadequate to address the public health and climate crises. We need you to act swiftly to protect our health, safety, and climate and promote equity by ensuring that new buildings do not perpetuate the use of fossil gas infrastructure.	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/19/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238935&DocumentContentId=72348
238935.002	Paliavi Pandit	<ul style="list-style-type: none"> • Health: The use of gas appliances, particularly gas stoves, degrades indoor air quality and harms health. Children living in homes with gas stoves are 42% more likely to experience symptoms of asthma. • Safety: Gas is a leading cause of structure fires, burns, and carbon monoxide poisoning, causing half of all fires post earthquakes. • Climate: Fracked gas releases methane at every step of the production cycle, making "natural" gas more destabilizing to the climate than coal. • Equity: Communities of color and low-income communities are disproportionately harmed by the extraction and storage of gas as well as the combustion of gas in the home, leading to inequitable health outcomes and increased mortality from COVID-19. 	Thank you for your comment. The Commission is aware of and sensitive to both indoor air quality and environmental justice concerns. To address these issues, the adopted language includes stringent kitchen ventilation requirements this code cycle. Staff will consider further action in the 2025 code cycle based on data accumulated during the 2022 cycle.	7/19/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238935&DocumentContentId=72348
238935.003	Paliavi Pandit	<p>There is no justification for continuing to build with dangerous and destabilizing gas when affordable and highly efficient electric appliances are readily available, including induction cooktops and heat pumps. The market is ready, it just needs a clear signal from the CEC.</p> <p>Bill McKibben wisely notes that, when it comes to the climate crisis, "Winning slowly is the same as losing." Don't fail our children by punting this necessary change to future code cycles. Take action now to initiate a just transition to all-electric new buildings so our children can have a healthy environment today and a livable climate tomorrow.</p>	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/19/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238935&DocumentContentId=72348
238935.003	Paliavi Pandit	<p>There is no justification for continuing to build with dangerous and destabilizing gas when affordable and highly efficient electric appliances are readily available, including induction cooktops and heat pumps. The market is ready, it just needs a clear signal from the CEC.</p> <p>Bill McKibben wisely notes that, when it comes to the climate crisis, "Winning slowly is the same as losing." Don't fail our children by punting this necessary change to future code cycles. Take action now to initiate a just transition to all-electric new buildings so our children can have a healthy environment today and a livable climate tomorrow.</p>	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/19/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?en=238935&DocumentContentId=72348

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238938.001	Sacramento Engineering Consultants	Power adjustment factors are not worth the extra costs. In practice PAFs would increase the project costs, while requiring the engineer to design extra controls. No one wants to spend the money when it's overall simpler and cheaper to reduce the number of lights installed, or choose a lower wattage fixture. I can truthfully state that in 25 years of doing Title 24 compliance, I have never used PAFs.	Thank you for the comment about the Power Adjustment factors (PAF) requirement/provision of the Code. This is the only comment the Commission have received so far about that PAF is no longer needed. Since there is no discussion or proposal about the value of keeping or not keeping the PAF requirement, the Commission could not simply to remove it based on one comment suggestion. It would be more appropriate to evaluate and discuss this item in 2025 Code	7/19/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=2384018;DocumentContentId=238938
238938.001	Sacramento Engineering Consultants	Power adjustment factors are not worth the extra costs. In practice PAFs would increase the project costs, while requiring the engineer to design extra controls. No one wants to spend the money when it's overall simpler and cheaper to reduce the number of lights installed, or choose a lower wattage fixture. I can truthfully state that in 25 years of doing Title 24 compliance, I have never used PAFs.	Thank you for the comment about the Power Adjustment factors (PAF) requirement/provision of the Code. This is the only comment the Commission have received so suggesting that PAF is no longer needed. Since there is no discussion or proposal about the value of keeping or not keeping the PAF requirement, the Commission could not simply to remove it based on one comment suggestion. It would be more appropriate to evaluate and discuss this item in future	7/19/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=2384018;DocumentContentId=238938
238938.002	Sacramento Engineering Consultants	Tailored is no longer needed. Before LED light fixtures have become the mainstream I used the tailored method quite a bit. A decade ago the only way you could get a retail store with lots of spot and track lighting to comply was to use Tailored. But gone are the days of 150 watt Metal Halide spot lights, replaced with 10 watt LEDs. It would be much better suited to give more Additional Allowance credits than continue to support Tailored as an antiquated methodology. There is also a fundamental difference between PAFs and Tailored - PAFs are do-something above-and-beyond what is required in terms of more advanced controls to get a small bonus, while Tailored is perform a more complicated and time intensive compliance method for the possibility of increased allowance.	Thank you for the comment that tailored method is no longer needed. It is good to hear that retail store lighting can be achieved nowadays without using tailored method, and that it is preferable to have additional lighting power allowance (credits) for the retail store lighting. Since there is no discussion or proposal about the value of keeping or not keeping the Tailored method, the Commission could not simply to remove it based on one comment suggestion. It would be more appropriate to evaluate and discuss this item in future Code Cycle.(for 2025 Code)	7/19/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=2384018;DocumentContentId=238938
238942.001	NLCAA	NA7.6.1.1 Construction Inspection Add "The Automatic daylight controls are shown on plan documents and are installed."	The 15-day language is "Prior to Functional testing, verify and document the following: (a) The daylight zones are shown on plans document. ..." The suggestion in the comment is about adding "and are installed". Although the proposed 15-day language does not include the phrase "and are installed", the readers most likely would understand it means to verify the daylight zones installed match to what is shown on the plans.	7/20/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=2384018;DocumentContentId=238942
238942.001	NLCAA	NA7.6.1.1 Construction Inspection Add "The Automatic daylight controls are shown on plan documents and are installed."	The 15-day language is "Prior to Functional testing, verify and document the following: (a) The daylight zones are shown on plans document. ..." The suggestion in the comment is about adding "and are installed". Although the proposed 15-day language does not include the phrase "and are installed", the readers most likely would understand it means to verify the daylight zones installed match to what is shown on the plans.	7/20/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?nr=2384018;DocumentContentId=238942

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238942.002	NLCAA	<p>100.1(b) Definitions: Automatic should not be used as the first word, when searching for an item users may not think to use "Automatic" as the first work. E.g., Automatic Time-Switch Control vs Time-Switch Controls.</p> <p>§110.9 "Time-Switch Lighting Controls" list all the Time controls in a very clear format, maybe §100.1 could align with §110.9?</p>	<p>The lighting and lighting controls definitons have been re-arranged in alphabetical order. "Automatic Time-Switch Control" would be kept as is - there have been devices that requires human actuation to trigger the operations (these are not truly automatic as the device would not act unless human activate the mechanism). "Automatic" is necessary to state clearly that the requirements are about automatic time-switch control and this is the type specified and</p>	7/20/2021	15-Day	https://efiling.energy.ca.gov/ETiling/GetFile.aspx?no=2384018&DocumentContentId=238942
238942.002	NLCAA	<p>100.1(b) Definitions: Automatic should not be used as the first word, when searching for an item users may not think to use "Automatic" as the first work. E.g., Automatic Time-Switch Control vs Time-Switch Controls.</p> <p>§110.9 "Time-Switch Lighting Controls" list all the Time controls in a very clear format, maybe §100.1 could align with §110.9?</p> <p>Lighting controls devices are under the "Lighting definitions:" or found in alphabetical order of §100.1 inconsistently, e.g. Auto Time Switch, Demand Response Control, Occupancy Sensor, Institutional Tuning and Shut-off Controls are some of the various definitions that are not placed uniformly.</p> <p>Should a "Lighting Controls:" section be used (remain) and listed just after "Lighting definitions:" with all controls definitions or should all the lighting controls be listed in alphabetical order throughout §100.1 or all of them under "Lighting"?</p> <p>This is an inconsistent code section.</p> <p>Starting at "Pendant Luminaire (Suspended Luminaire)" and after needs to be indented to the left.</p> <p>"Driver" which is just after "Solid State Lighting (SSL)" is not in</p>	<p>"Automatic Time-Switch Control" was kept as is - there have been devices that requires human actuation to trigger the operations (these are not truly automatic as the device would not act unless human activate the mechanism). "Automatic" is necessary to state clearly that the requirements are about automatic time-switch control and this is the type specified and required in the code section with the term "automatic time-switch controls".</p> <p>The lighting and lighting controls definitons was re-arranged in alphabetical order.</p>	7/20/2021	15-Day	https://efiling.energy.ca.gov/ETiling/GetFile.aspx?no=2384018&DocumentContentId=238942

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238942.003	NLCAA	<p>SECTION 110.12 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT</p> <p>110.12(a) Demand responsive controls.</p> <p>1. All demand responsive controls shall be either:</p> <p>A. A certified 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</p> <p>B. Certified by the manufacturer as being capable of responding to a demand response signal from a certified OpenADR 2.0b Virtual End Node by automatically implementing the control functions requested by the Virtual End Node for the equipment it controls.</p> <p>NLCAA Comment:</p> <ul style="list-style-type: none"> • A. and B. are not clearly explaining the differences between each other and how they must be applied. This code in misapplied in the field consistently. Please ensure that the Compliance Manual has a clear explanation of this code section and how it is to be applied to the various scenarios. • Consider incorporating the 2019 Compliance Manual explanation of option A and B into Section 110.12(a) as code language or a note. 	This will be handled in the compliance manual. Note that we cannot put in a reference into the code language at this time.		15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238942&DocumentContentId=72360
238942.003	NLCAA	<p>SECTION 110.12 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT</p> <p>110.12(a) Demand responsive controls.</p> <p>1. All demand responsive controls shall be either:</p> <p>A. A certified 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</p> <p>B. Certified by the manufacturer as being capable of responding to a demand response signal from a certified OpenADR 2.0b Virtual End Node by automatically implementing the control functions requested by the Virtual End Node for the equipment it controls.</p> <p>NLCAA Comment:</p> <ul style="list-style-type: none"> • A. and B. are not clearly explaining the differences between each other and how they must be applied. This code in misapplied in the field consistently. Please ensure that the Compliance Manual has a clear explanation of this code section and how it is to be applied to the various scenarios. • Consider incorporating the 2019 Compliance Manual explanation of option A and B into Section 110.12(a) as code language or a note. 	This will be handled in the compliance manual. Note that we cannot put in a reference into the code language at this time. As most of the stakeholder's concerns deal with guidance documents such as the Blueprint Newsletter and Compliance Manuals, staff will ensure that this issue is addressed in both.		15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?fn=238942&DocumentContentId=72360
238964.001	David Page	I'm writing to urge you to strongly/radically/dramatically improve the state building codes! There could be gigantic reductions in the amount of pollution which underlies worsening droughts and wildfires - if you so choose - or there could be minimal change. It's up to you. Please help!	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/22/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=238964&DocumentContentId=72385

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238964.001	David Page	I'm writing to urge you to strongly/radically/dramatically improve the state building codes! There could be gigantic reductions in the amount of pollution which underlies worsening droughts and wildfires - if you so choose - or there could be minimal change. It's up to you. Please help!	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/22/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=238964&DocumentContentId=72385
239005.001	Coco Louie	<p>All electric building codes were needed yesterday</p> <p>Hi. I'm a Bay-Area resident and a student at the Nueva School. On behalf of my community, I'd like to express my strong support for all electric building codes. Many California cities, including San Francisco, the one I call home, have already passed all electric reach codes. There is no reason the state of California shouldn't as well.</p> <p>I'm only 16, but in the past four years I've seen the growing impacts of climate change ravage this state. Wildfire season has gotten longer, more intense, and more destructive, and it will only continue to get worse if we don't take action against climate change.</p> <p>Residential energy consumption is one of the largest contributors to carbon emissions, and an all electric building standard would be a huge step in the fight for our state, our country, and our planet.</p> <p>I urge the CEC to take action, and quickly. Passing all electric building codes as soon as possible is crucial to saving our planet and our futures.</p>	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239005&DocumentContentId=72431
239005.001	Coco Louie	<p>All electric building codes were needed yesterday</p> <p>Hi. I'm a Bay-Area resident and a student at the Nueva School. On behalf of my community, I'd like to express my strong support for all electric building codes. Many California cities, including San Francisco, the one I call home, have already passed all electric reach codes. There is no reason the state of California shouldn't as well.</p> <p>I'm only 16, but in the past four years I've seen the growing impacts of climate change ravage this state. Wildfire season has gotten longer, more intense, and more destructive, and it will only continue to get worse if we don't take action against climate change.</p> <p>Residential energy consumption is one of the largest contributors to carbon emissions, and an all electric building standard would be a huge step in the fight for our state, our country, and our planet.</p> <p>I urge the CEC to take action, and quickly. Passing all electric building codes as soon as possible is crucial to saving our planet and our futures.</p>	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239005&DocumentContentId=72431

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239006.001	Taylor Engineering	<p>EXCEPTION 1 to Section 120.1(c)3: Designed Occupancy requires that the AHJ allows this option to occur by the reference to “the Exception to Section 1004.5 of the CBC”:</p> <p>“Exception: Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.”</p> <p>Having to get approval from the AHJ is an unnecessary burden to designers, and also is not necessary – exiting can be designed for a greater number of people than the ventilation system is designed for. Instead, delete “per the Exception to Section 1004.5 of the CBC” and reinstate the assumption in earlier versions of Title 24, and Table 120.1- A, that specifies that the density of occupants shall not be less than half of the exiting density required by CBC Chapter 10. This assumption is what is built into the area rate in Table 120.1-A, per footnote 1. Why not allow this assumption to be made for this Exception?</p>	<p>This exception follows requirements from the California Building Code. This exception is allowed to ensure that occupancy allowances identified for the building officials can be used.</p>	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435
239006.001	Taylor Engineering	<p>EXCEPTION 1 to Section 120.1(c)3: Designed Occupancy requires that the AHJ allows this option to occur by the reference to “the Exception to Section 1004.5 of the CBC”:</p> <p>“Exception: Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.”</p> <p>Having to get approval from the AHJ is an unnecessary burden to designers, and also is not necessary – exiting can be designed for a greater number of people than the ventilation system is designed for. Instead, delete “per the Exception to Section 1004.5 of the CBC” and reinstate the assumption in earlier versions of Title 24, and Table 120.1- A, that specifies that the density of occupants shall not be less than half of the exiting density required by CBC Chapter 10. This assumption is what is built into the area rate in Table 120.1-A, per footnote 1. Why not allow this assumption to be made for this Exception?</p>	<p>This exception follows requirements from the California Building Code. This exception is allowed to ensure that occupancy allowances identified for the building officials can be used.</p>	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435

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239006.002	Taylor Engineering	<p>Note that ASHRAE Guideline 36 control sequences require the use of this exception in order to disaggregate the occupant and area components of the ventilation rate in order to properly implement CO2 demand-controlled ventilation and properly use occupancy sensors which indicate whether the occupant component is needed. Guideline 36 requires that users separately enter these two values: Section 3.1.1.2 of Guideline 36-2018, requires that the engineer enter these two values for each zone:</p> <p>Research has shown Guideline 36 sequences save considerable energy (see https://taylorengeers.com/wp-content/uploads/2020/04/2018-09-18-AdvancedHVAC-Controls-Case-Study-555-County-Center.pdf for example) so requiring that AHJ's approve of use of this exception almost disallows the use of Guideline 36 and result in significant energy waste.</p>	The revision to the energy code does not exclude the project from calculating Vocc-min or Varea-min using the calculations to determine these values.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435
239006.002	Taylor Engineering	<p>Note that ASHRAE Guideline 36 control sequences require the use of this exception in order to disaggregate the occupant and area components of the ventilation rate in order to properly implement CO2 demand-controlled ventilation and properly use occupancy sensors which indicate whether the occupant component is needed. Guideline 36 requires that users separately enter these two values: Section 3.1.1.2 of Guideline 36-2018, requires that the engineer enter these two values for each zone:</p> <p>Research has shown Guideline 36 sequences save considerable energy (see https://taylorengeers.com/wp-content/uploads/2020/04/2018-09-18-AdvancedHVAC-Controls-Case-Study-555-County-Center.pdf for example) so requiring that AHJ's approve of use of this exception almost disallows the use of Guideline 36 and result in significant energy waste.</p>	The revision to the energy code does not exclude the project from calculating Vocc-min or Varea-min using the calculations to determine these values. No changes were made to the code language.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435
239006.003	Taylor Engineering	<p>So please: 1. Delete "per the Exception to Section 1004.5 of the CBC"</p>	The occupancy is a requirement of the california building codes. Even if the requirement is not listed here in the energy code, this occupation methodology would still apply.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435
239006.003	Taylor Engineering	<p>So please: 1. Delete "per the Exception to Section 1004.5 of the CBC"</p>	The occupancy is a requirement of the california building codes. Even if the requirement is not listed here in the energy code than this occupation methodology would still apply.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435
239006.004	Taylor Engineering	<p>2. In the definition of Pz, modify the second sentence: "The expected number of occupants shall be the expected number specified by the building designer, but no less than one half of the maximum occupant load assumed for egress purposes in the CBC."</p>	This exception follows requirements from the California Building Code. This exception is allowed to ensure that occupancy allowances identified for the building officials can be used.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435
239006.004	Taylor Engineering	<p>2. In the definition of Pz, modify the second sentence: "The expected number of occupants shall be the expected number specified by the building designer, but no less than one half of the maximum occupant load assumed for egress purposes in the CBC."</p>	This exception follows requirements from the California Building Code. This exception is allowed to ensure that occupancy allowances identified for the building officials can be used.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435
239006.005	Taylor Engineering	<p>Better yet, revert back to the 2013 ventilation section which is so much less complicated.</p>	A proposal would need to be provided to justify reverting back to 2013 ventilation language. This would need to be reviewed and possibly applied to 2025 update.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72435

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239006.005	Taylor Engineering	Better yet, revert back to the 2013 ventilation section which is so much less complicated.	A proposal would need to be provided to justify reverting back to 2013 ventilation language. This would need to be reviewed and possibly applied to 2025 update.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239006&DocumentContentId=72434
239007.001	Taylor Engineering	Section 120.1(c)1.: 1. Wherever "MERV" is referenced, it should be changed to "MERV-A", i.e. require filters to be tested after being preconditioned using ASHRAE 52.2 Appendix J. There are many filters on the market, especially the inexpensive 1" and 2" filters, that meet MERV 13 by creating a static charge on the media that causes an "initial" efficiency of MERV 13, but the charge readily dissipates and performance typically falls well below MERV 11. This is a significant loophole in the ASHRAE 52.2 method of test that was resolved by the addition of Appendix J. However, that appendix is optional; uses must specify that they require the preconditioning procedure to ensure they are getting the desired performance. The term "MERVA" should be added to the definition section as the Minimum Efficiency Reporting Value when the filter is tested in accordance with ASHRAE 52.2 including Appendix J.	Staff finds that existing references to MERV within the Energy Code are references to MERV and not to MERV-A, and that changing requirements to specify MERV-A where MERV is currently specified would require a complete code change proposal so that the costs and benefits of doing so can be considered and disclosed to the public. Staff therefore invites the commenter to submit a complete code change proposal relating to use of MERV-A in place of MERV for the next regular rulemaking proceeding.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239007&DocumentContentId=72434
239007.001	Taylor Engineering	Section 120.1(c)1.: 1. Wherever "MERV" is referenced, it should be changed to "MERV-A", i.e. require filters to be tested after being preconditioned using ASHRAE 52.2 Appendix J. There are many filters on the market, especially the inexpensive 1" and 2" filters, that meet MERV 13 by creating a static charge on the media that causes an "initial" efficiency of MERV 13, but the charge readily dissipates and performance typically falls well below MERV 11. This is a significant loophole in the ASHRAE 52.2 method of test that was resolved by the addition of Appendix J. However, that appendix is optional; uses must specify that they require the preconditioning procedure to ensure they are getting the desired performance. The term "MERVA" should be added to the definition section as the Minimum Efficiency Reporting Value when the filter is tested in accordance with ASHRAE 52.2 including Appendix J.	These requirements were included during the 2019 rulemaking. Revising existing code would require a measure proposal and associated backup material. Staff would welcome a proposal for the 2025 Energy Code update cycle.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239007&DocumentContentId=72434
239007.002	Taylor Engineering	Section 120.1(c)1.: 2. Item C.i. should say "Filters with a nominal depth of 2 inches or more." Certainly there is no intent to outlaw deeper filters. As worded, high efficiency 3- and 4- inch filters and all bag and cartridge filters could not be used.	Staff finds that the language specifies a "nominal two inch <i>minimum</i> depth filter", meaning a minimum nominal depth of two inches - it is not necessary to add the phrase "or more". Larger depths are permissible under the language as written, consistent with the commenter's request.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239007&DocumentContentId=72434
239007.002	Taylor Engineering	Section 120.1(c)1.: 2. Item C.i. should say "Filters with a nominal depth of 2 inches or more." Certainly there is no intent to outlaw deeper filters. As worded, high efficiency 3- and 4- inch filters and all bag and cartridge filters could not be used.	These requirements were included during the 2019 rulemaking. Revising existing code would require a measure proposal and associated backup material. Additionally, language requires a "minimum" depth and does not limit the depth to 2 inches.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239007&DocumentContentId=72434

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239012.001	RMI, Earthjustice, Sierra Club, NRDC	<p>As the Energy Commission finalizes the 2022 Energy Code, is it critical that the significant progress that has been achieved in the proposed code be retained with no weakening of proposed provisions. We highlight specific proposed improvements in this code cycle that are necessary to further California's climate, health, and air quality goals.</p> <p>1) Use of HPWHs as baseline for single family homes in most climate zones. We appreciate that the Commission has responded to concerns expressed in our comments on the Draft Terms and now includes Climate Zone 10 among the climate zones with heat pump water heaters ("HPWHs") in its baseline. This is a meaningful improvement to the 2022 Express Terms that will advance clean and efficient all-electric construction in western Riverside and eastern San Diego counties.</p> <p>We urge the Commission to maintain these impactful features so that California can begin to reap the benefits of transitioning to all-electric buildings when the code goes into effect in 2023.</p>	Staff appreciate the support	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239012&DocumentContentId=72444
239012.002	RMI, Earthjustice, Sierra Club, NRDC	<p>As the Energy Commission finalizes the 2022 Energy Code, is it critical that the significant progress that has been achieved in the proposed code be retained with no weakening of proposed provisions. We highlight specific proposed improvements in this code cycle that are necessary to further California's climate, health, and air quality goals.</p> <p>2) The strengthened and expanded electric-ready requirements for water heating, space heating, cooking, and drying will ensure that new homes fueled by gas will be able to affordably upgrade to electric appliances in the future. Importantly, the 2022 Express Terms also require new homes that are not built with a HPWH to have the necessary space and plumbing to ensure future ease of installation.</p> <p>We urge the Commission to maintain these impactful features so that California can begin to reap the benefits of transitioning to all-electric buildings when the code goes into effect in 2023.</p>	Staff appreciate the support	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239012&DocumentContentId=72444
239012.003	RMI, Earthjustice, Sierra Club, NRDC	<p>As the Energy Commission finalizes the 2022 Energy Code, is it critical that the significant progress that has been achieved in the proposed code be retained with no weakening of proposed provisions. We highlight specific proposed improvements in this code cycle that are necessary to further California's climate, health, and air quality goals.</p> <p>3) Inclusion of heat pump space heating in baseline for single-zone HVAC systems typically used in multifamily and small non-residential buildings in almost all climate zones.</p> <p>We urge the Commission to maintain these impactful features so that California can begin to reap the benefits of transitioning to all-electric buildings when the code goes into effect in 2023.</p>	Staff appreciate the support	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239012&DocumentContentId=72444

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239012.004	RMI, Earthjustice, Sierra Club, NRDC	<p>As the Energy Commission finalizes the 2022 Energy Code, it is critical that the significant progress that has been achieved in the proposed code be retained with no weakening of proposed provisions. We highlight specific proposed improvements in this code cycle that are necessary to further California's climate, health, and air quality goals.</p> <p>4) Differentiated ventilation requirements in residential and multifamily kitchens depending on fuel type of cooking range.</p> <p>We urge the Commission to maintain these impactful features so that California can begin to reap the benefits of transitioning to all-electric buildings when the code goes into effect in 2023.</p>	Staff appreciates and notes the comment. The 15-day language does not revise kitchen range hood requirements that are proposed.	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239012&DocumentContentId=72444
239012.005	RMI, Earthjustice, Sierra Club, NRDC	<p>We look forward to working with the Energy Commission on the implementation phase of this code and related incentive programs to ensure as much new construction is all-electric as possible leading into the next code cycle. As our organizations have made clear, the urgency of the climate crisis demands an immediate end to gas system expansion. We urge the Commission to commit to achieving this critical objective by ensuring that in the 2025 update of the building code, both heat pump space and water heating is in the performance baseline for new construction in all building types, as well as for additions and alterations.</p>	Staff appreciate the support and will reconsider the comment for the 2025 rulemaking	7/26/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239012&DocumentContentId=72444
239020.001	Mitsubishi Electric	<p>While we generally support the Commission's improvements to Title 24, Part 6, we continue to have several concerns related to VRF products and economizer and DOAS requirements. The proposed overlay of economizer or DOAS with bypass requirements on VRF units under 54kbtu and the supporting modeled research do not account for the fact that VRF systems perform particularly well in low-load conditions that overlay economizer run times. We propose an economizer and DOAS bypass exemption for VRF systems under 54kbtu, and an exemption for VRF with heat recovery wherein waste heat from zones calling for cooling is redirected to zones simultaneously calling for heating. This feature alone is known to increase VRF system efficiency in the range of 20% -40%* 1 under such partial and mixed load conditions, precisely when economizers would be in operation.</p>	<p>The primary pathway for this proposal is a roof top unit with an economizer. VRF systems have multiple ways of complying, such as using the economizer trade off tables or comply via the performance approach.</p> <p>While heat recovery may increase efficiency, there has been no data to support the range of efficiency. Staff welcomes manufacturers to provide this efficiency to better capture credits for VRF systems.</p>	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451

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239020.001	Mitsubishi Electric	While we generally support the Commission's improvements to Title 24, Part 6, we continue to have several concerns related to VRF products and economizer and DOAS requirements. The proposed overlay of economizer or DOAS with bypass requirements on VRF units under 54kbtu and the supporting modeled research do not account for the fact that VRF systems perform particularly well in low-load conditions that overlay economizer run times. We propose an economizer and DOAS bypass exemption for VRF systems under 54kbtu, and an exemption for VRF with heat recovery wherein waste heat from zones calling for cooling is redirected to zones simultaneously calling for heating. This feature alone is known to increase VRF system efficiency in the range of 20% -40%* 1 under such partial and mixed load conditions, precisely when economizers would be in operation.	The primary pathway for this proposal is a roof top unit with an economizer. VRF systems have multiple ways of complying, such as using the economizer trade off tables or comply via the performance approach. While heat recovery may increase efficiency, there has been no data to support the range of efficiency. Staff welcomes manufacturers to provide this efficiency to better capture credits for VRF systems.	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239020.002	Mitsubishi Electric	Studies on VRF and Economizer Performance Suggest Limited Gains from Combining Them The CEC 15-day language continues to impose economizer requirements on commercial VRF systems by lowering the requirement threshold from 54kbtu to 33kbtu (Section 140.4 (e)1) on all indoor units. The language in Exception 6 still requires economizer modes of operation for VRF systems paired with either coupled or decoupled DOAS (definition includes DX-DOAS and ERVs that are either separate or connected to primary conditioning system returns or supply plenums). According to the substantially rewritten Section140.4(p), economizer modes or DOAS bypass systems must have flow rates of outside air in a bypass mode of .3cfm/sq. foot (Sect.140.4(p)1).	Staff determined that the CASE team's analysis demonstrated that this proposal provides energy savings for the primary pathway. The ventilation requirement sets a minimum for energy savings by economizing.	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239020.003	Mitsubishi Electric	Imposing economizer or DOAS requirements on VRF increases system costs significantly and threatens to diminish the VRF market. According to a research publication by the Bonneville Power Administration (BPA): "Several studies have shown that economizers seldom save as much energy as they should. In addition, adding economizers to VRF systems, or dedicated ventilation systems may not be cost effective.... Energy modeling performed for the Washington State Energy Code estimated that because a VRF system with heat recovery capability uses about the same amount of energy as a non-VRF system with economizers, there is an exception to the economizer requirement for VRF systems with heat recovery capability. Oregon Energy Code also has an exception to the economizer requirement for VRF systems with heat recovery capability."* 1	Staff has found this to be cost effective for the primary pathway. The BPA document from 2012 is dated, brief, and does not contain a thorough analysis compared to the one provided by the CASE team which is specific to California's sixteen climate zones.	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451

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239020.004	Mitsubishi Electric	<p>We have estimated conservatively that VRF systems have a 20% efficiency advantage over rooftop systems. A 2017 national study conducted modeling on VRF system efficiencies compared to rooftop units (RTUs) in sixteen US climate zones and concluded the following:</p> <p>“The simulation results show that the VRF systems would save around 15–42% and 18– 33% for HVAC site and source energy uses compared to the RTU-VAV systems. In addition, calculated results for annual HVAC cost savings point out that hot and mild climates show higher percentage cost savings for the VRF systems than cold climates mainly due to the differences in electricity and gas use for heating sources.”*2</p>	<p>Staff welcomes manufacturers to provide data to back these efficiency advantage claims. The cited source from the ORNL is based on a nationwide climate zones where only two California cities were modeled. This simulation study also does not use a California T24 baseline which would alter the amount of energy savings reported.</p>	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239020.005	Mitsubishi Electric	<p>The current CEC proposal overlays RTU economizer requirements on what is already a class of highly efficient VRF products with fewer failure modes. VRF system efficiency exceed 20%- 40% compared to a maximum of 16% efficiency enhancement for RTUs with economizers according to some estimates* 1&3 . Taken together, these factors suggest the proposed VRF economizer requirement is impractical and will not achieve the desired result and may actually cause net efficiency losses especially in the shoulder seasons where simultaneous cooling and heating is more likely to occur. Furthermore, VRF systems offer more diverse zone control and the ability to fully shut off unoccupied zones. This is not an option with central RTU type systems.</p>	<p>Staff welcomes manufacturers to provide data to back these efficiency advantages. The cited source from the ORNL is based on a nationwide climate zones where only two California cities were modeled. This simulation study also does not use a California T24 baseline which would alter the amount of energy savings reported.</p> <p>High efficient systems are able to utilize the economizer trade off tables and the performance pathway to comply with the prescriptive requirements.</p>	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239020.006	Mitsubishi Electric	<p>We again suggest that the request for a VRF exemption is entirely reasonable and consistent with regulatory precedent in other states. Although CASE Team and staff have suggested that the Economizer Trade Off Table 140.4F provides recognition to higher efficiency rating equipment, this exemption path doesn't substitute for a VRF exemption because the 25% efficiency gains attributable to VRF are not recognized by either the California Energy Code or CBECC, the compliance software.</p>	<p>Staff welcomes manufacturers to provide data and to provide a proposal change.</p>	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451

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239020.007	Mitsubishi Electric	<p>Requiring Economizers on VRF is Neither Cost-Effective Nor Efficient Even when VRF systems aren't equipped with heat recovery, a DOAS system attempting to increase VRF system efficiency by operating with direct outside air cooling under evening partial load conditions is attempting to improve VRF efficiencies when they are likely to be idling at their highest system efficiencies. One can compare the power demand of a compressor running at low-load times to the high fan power required to run an economizer during the same conditions and conclude they are at best a wash. The 0.3 CFM/sq.ft. requirement is roughly equal to the ventilation required for high ventilation applications like schools but is roughly double the ASHRAE 62.1 minimum ventilation rate for many other commercial applications. Consequently, there is an inherent energy and cost tradeoff in order to economize for these applications. The compressor is shut off and mechanical cooling ceases, but in order to economize, the large central fans in the DOAS/ERV need to ramp up in order to accommodate the minimum economizer flow rate. The economizer run hours coincide when VRF compressor speeds are generally idling at a minimum and system efficiencies are high.</p> <p>When VRF heat recovery efficiencies are added to this equation, there is a diminishing return for utilizing economizers when heat recovery is simultaneously moving waste heat from cooling zones to heating zones, whether or not the majority of zones are calling for cooling. In essence, there's an energy trade-off</p>	The economizer requirements are for the primary pathway. VRF and other efficient systems can utilize the economizer trade off table or comply via the performance pathway.	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239020.008	Mitsubishi Electric	<p>VRF with Heat Recovery Should be Given Greater Compliance Credit Although Table 140.4-D (below) offers some economizer exemptions for the improved efficiency of any system with 30% to 70% higher IEER (or COP), it doesn't specifically acknowledge the additional efficiency of VRF with heat recovery estimated to add an additional 20% to 30% system efficiency depending upon climate zone and load conditions. Not to be confused with "heat recovery" in an ERV or HRV, VRF heat recovery is moving "waste" heat from one zone in a VRF system calling for cooling, to another zone in the same system calling for heat and it does so through branch control boxes (valve boxes) that allow the heat to be moved to other zones in the building through the refrigerant loops without that refrigerant going through the outdoor unit (compressor). These system efficiencies tend to be highest when loads are moderate, similar conditions for when economizers may be operating, and it is unlikely that the efficiencies are cumulative. For this reason, it is important to recognize VRF heat recovery efficiencies by exempting these systems from economizer requirements, otherwise the overlay of requirements create conditions wherein competing system features cancel the measurable efficiency in the field.</p>	Updating the Table 140.4-D is out of scope for this proposal, but staff welcomes stakeholders to submit a code change proposal to update these tables for future code cycles.	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451

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239020.009	Mitsubishi Electric	Prescriptive Requirements for Space Conditioning Systems by Climate Zone Under Section 140.4 (a) 2B & F, the energy code 15 day language now requires that only office, financial, library, retail and grocery applications in specified climate zones with cooling capacities less than 65kbtu "must be served by a furnace plus AC system". Given the state's decarbonization mandates, dual-fuel HP systems should be required as these systems have been demonstrated to lower both NOx (up to 98%) and CO2 emissions by as much as 69%*6 . However, despite possible source energy advantages for DFHPs in these applications, the energy code should allow cold-climate HPs (CCHPs) to fulfill these applications as they are highly efficient down to -20°F. The greening of the grid and a 100% RPS that is expected by 2045 will make the source energy profile of CCHPs competitive.	Staff determined that the regulations allow for installation of cold climate heat pumps: staff notes that cold climate heat pumps are available in the market and have previously considered similar comments. Such heat pumps may be used under the performance compliance method, and staff encourages their use where appropriate as an efficient option.	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239020.010	Mitsubishi Electric	<p>Partial Electric Baselines as Applied to Specific Climate Zones</p> <p>We are deeply appreciative that Section 150.1(c)7, sets partial electric baselines with compliance credit (EDR) to highly motivate the specification of heat pumps. However, we continue to question the logic of the climate zones that have been chosen for single family dwellings. It appears that the CEC has set a very low bar for how well they expect the ASHP systems to perform. Section 150.1 (c)7 currently calls for HP space heating (ASHPs) in climate zones 3, 4, 10, 13 and 14. These climate zones were chosen based on cost effectiveness of the systems, but wholesale gas versus ASHP equipment costs posted to the docket by NRDC indicate that ASHP equipment is 15% to 30% cheaper than similar central furnace plus AC systems of the same brand and efficiency. This fact alone would dictate that ASHPs should be required in all jurisdictions that now require ultra-low NOx furnaces and where AC is generally installed in new homes (30% more expensive than ASHPs) which includes the San Joaquin AQMD and SCAQMD jurisdictions (CZs 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15). Therefore, we recommend that central ASHPs be encouraged in climate zones 3,4,5,6,7,8,9,10,12,13,14,15 and that DFHPs or cold-climate HPs be required in climate zones 1, 2, 11 and 16.</p>	<p>The rationale for the heat pump (HP) baseline is set forth in the report "Heat Pump Baseline for Non-residential and High-Rise Residential Buildings" TN 238849. The goal for this rulemaking is to set either heat pump water heater (HPWH) or HP space heater as the baseline performance standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace.</p> <p>Staff determined that the regulations allow for installation of cold climate heat pumps: staff notes that cold climate heat pumps are available in the market and have previously considered similar comments. Such heat pumps may be used under the performance compliance method, and staff encourages their use where appropriate as an efficient option.</p>	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451

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239020.011	Mitsubishi Electric	<p>Concerns about Addition of Ambiguous Term in Table 140.4-A</p> <p>Table 140.4-A requires a fan power deduction when “systems feed a terminal unit with a fan with electrical input power <=1kW”. When asked for clarification, a CASE Team staffer responded that “the term “terminal unit” covers the device at the end of the air distribution system and not the upstream AHU/DOAS/other equipment”. In this context, terminal unit could consist of any type of equipment depending upon system configuration. Two CASE Team staff later agreed on the following interpretation: “In the example of a coupled DOAS serving fan terminal units, the DOAS fan itself, if it was greater than the 1kW limit, must stay within a power budget as stated. If that DOAS fan (say it is a 3 kW fan), serves fan terminal units and those fan terminal units are smaller than 1 kW (1kW that feed a terminal unit or units with a fan with electrical input power <=1kW”, although it is not at all clear what the basis for this deduction is in the research. Why is a DOAS feeding two terminal units of under 1kW not afforded the same power budget as an identical system serving a single terminal unit of the same total capacity? The grounds for the fan-power deduction is not obvious.</p>	<p>“Terminal unit” refers to the device at the end of the air distribution system and not the upstream AHU/DOAS/ other equipment. Further technical information about this topic and relevant requirements will be provided in the 2022 guidance documents, including manuals, and compliance software, which will be released at a later date.</p>	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239020.012	Mitsubishi Electric	<p>Conclusions</p> <p>Mitsubishi Electric is concerned that rushing to implement economizer requirements on all VRF indoor units under 54kbtu fails to recognize the efficiencies and advantages of VRF systems in 7 their various configurations. Economizer requirements should be limited to packaged systems for which economizers are designed, and it is inherently disadvantageous to overlay this requirement onto VRF multi-split systems. We specifically ask that the CEC consider the same regulations instituted by Oregon and Washington based on their own assessment of the research, and allow an exemption for VRF systems. Proceeding with the 33kbtu requirement as the CEC appears to be doing will very likely reduce the installation and use of these inherently more efficient VRF products in the state, which works against the current strategic electrification initiative aimed at reducing carbon emissions and the intent of this new version of Title 24, Part 6. Thank you for the opportunity to comment and we look forward to working with the Commission to ensure desired efficiency results.</p>	<p>VRF systems and other alternatives with greater efficiency may be used under the performance compliance method, and staff encourages their use where appropriate as an efficient option.</p>	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239020&DocumentContentId=72451
239021.001	Dawn Hollingsworth	<p>Sections 130.2(c)3 and 160.5(c)2C</p> <p>There have been numerous industry studies proving this technique doesn't work as intended leaving the owner and users with a burden of purchasing technology that doesn't meet functional standards. In many cases the motion sensors do not have the sensitivity to sense a person in proximity to the zone and they are still left in the dark without the security and safety of proper lighting. This is a matter of life safety with technology that doesn't work.</p>	<p>Due to lack of evidentiary data to evaluate the validity of the comment and along with the pros and cons of the proposed change for the outdoor motion sensing controls requirements - staff recommends not to adopt any changes in this code cycle for the motion sensing controls and not to adopt Exception 4 to Section 130.2(c)3 and Exception 4 to Section 160.5(c)2C.</p>	7/27/2021	45-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239021&DocumentContentId=73021

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239022.001	Dawn Hollingsworth	Multi-family Section 160 not necessary I am sure someone paid a lot of money for a case study to justify adding hundreds of pages of code in the 2022 T24 Part 6, but there was no reason to add the Multifamily section 160 (and related sections 170/180). There has never been difficulty demising the residential units under the residential requirements and the common areas under the commercial code. If there were valid reasons for distinct language these could have been addressed in the same way hotel rooms have been identified in the commercial code. Once language is codified it becomes ever increasingly difficult to manage and update. These sections are unnecessary and place an undue burden on practitioners.	The new multifamily chapters, including Section 160.0, were created in response to stakeholder requests for a new code specifically for multifamily buildings, in lieu of relying on combinations of both single family and nonresidential code. Staff determined that organizing the regulations to create dedicated chapters for this specific class of building both fits the intent of the original separation of residential and nonresidential provisions, and is likely to enhance usability given that users can identify applicable chapters based on the type of space being designed.	7/27/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239022&DocumentContentId=72448
239046.001	NEMIC	(1) The proposed amendment to Section 10-103(a)4B to exclude Certificates of Acceptance recorded by an ATTCP lack justification or clarity – it is unclear what this change means to ATTCPs;	This language has been added in the 15-day language sections 10-103 and 10-109 and JA7.4.8. It precludes the "double registration" of NRCA forms with both the ATTCP and the NDR (if one is approved by the CEC).	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239046&DocumentContentId=72486
239046.002	NEMIC	(2) Multi-family dwelling unit acceptance test NA7.18.1 and NA7.18.2 should be amended to require all verification to be performed by certified acceptance testers not HERS Raters – the proposed mixed approach is unnecessary, creates confusion and relies on technicians that are not experienced in the types of HVAC systems found in multifamily buildings.	The adopted language in Section NA1.9 allows for a different compliance path to using the HERS Rater. It allows an ATT to substitute their training, testing, and NRCA data recording for the HERS Rater. We encourage stakeholders to submit a proposal for the 2025 Energy Code update cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239046&DocumentContentId=72486
239046.003	NEMIC	(3) Applying the less accurate HERS leakage test method to multifamily residential buildings will result in increased energy loss compared to using the more reliable method set forth in the California Mechanical Code § 603.10.1.	Staff has determined that for systems serving unitary dwelling units the HERS leakage testing method is appropriate, and staff received no evidence to the contrary. We encourage stakeholders to submit a proposal for the 2025 Energy Code update cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239046&DocumentContentId=72486
239046.004	NEMIC	On July 12, 2021, CalCERTS submitted comments opposing NEMIC's position on the above issues. The CalCERTS comments are based on their claim that dwelling unit ventilation fan tests and leakage tests are identical to single family home fan and leakage tests. This statement fails to account for the very different complexities of dwelling systems installed in multi-family high-rise buildings. For example, even where dwelling units in high-rise buildings have individual heating and air conditioning units, they also often have common ventilation shafts, central fresh air shafts and common exhaust shafts. This inaccurate assumption underscores why it is important to ensure that experienced and trained acceptance testers perform this work instead of HERS testers. Unlike HERS testers, acceptance testers must have "at least three years of professional experience and expertise in mechanical controls and systems" in addition to training on a much broader and sophisticated range of HVAC acceptance tests.	Thank you for your comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239046&DocumentContentId=72486

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239046.005	NEMIC	In addition, the CalCERTS letter entirely ignores the limitations and documented inaccuracy of the HERS leakage test method. The cost-effectiveness of this less accurate method may outweigh greater accuracy when it comes to the energy that would be lost in a single family home. But in a large high-rise multi-family building, the energy potentially wasted is much greater. CalCERTS provides no rationale for not requiring usage of the more reliable method set forth in the California Mechanical Code § 603.10.1.	Thank you for your comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239046&DocumentContentId=72486
239046.006	NEMIC	Finally, CalCERTS expressly acknowledges that the delegation of testing and verification in multi-family building between acceptance testers and HERS Raters is "complex and can be confusing." It is precisely for this reason that all multifamily acceptance tests should be performed by certified acceptance testers. There is no benefit to carving out a portion of this work for HERS Raters when it would be more easily and more accurately performed by certified acceptance testers.	Thank you for your comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239046&DocumentContentId=72486
239047.001	PIMA	Amend Section 141.0(b)2B B. Existing roofs of a nonresidential or hotel/motel building being replaced, recovered or recoated, as defined in Section 100.1(b) and Title 24, Part 2, Chapter 2, shall meet the requirements of Section 110.8(i). For rRoofs where with more than 50 percent of the roof area or more than 2,000 square feet of roof, whichever is less, is being altered, the requirements of i and ii below apply:	Thank you for your comment. Staff finds that proposed suggestion would not improve clarity of the requirement. No changes were made.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239047&DocumentContentId=72485
239047.001	PIMA	Amend Section 141.0(b)2B B. Existing roofs of a nonresidential or hotel/motel building being replaced, recovered or recoated, as defined in Section 100.1(b) and Title 24, Part 2, Chapter 2, shall meet the requirements of Section 110.8(i). For Roofs where with more than 50 percent of the roof area or more than 2,000 square feet of roof, whichever is less, is being altered, the requirements of i and ii below apply:	Thank you for your comment. Staff recommended, and the Commission concluded, that no changes were necessary to these sections, and so no changes made to the code language in the 2022 cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239047&DocumentContentId=72485
239047.002	PIMA	Amend section 180.2(b)1A A. Roof Alterations. Existing roofs being replaced, recovered or recoated, of a multifamily building shall meet the requirements of Section 110.8(i). For rRoofs where with more than 50 percent of the roof area or more than 2,000 square feet of roof, whichever is less, is being altered, the requirements of i through iii below apply:	Thank you for your suggestion. Suggested grammatical corrections. Non-substantive.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239047&DocumentContentId=72485
239047.002	PIMA	Amend section 180.2(b)1A A. Roof Alterations. Existing roofs being replaced, recovered or recoated, of a multifamily building shall meet the requirements of Section 110.8(i). For Roofs where with more than 50 percent of the roof area or more than 2,000 square feet of roof, whichever is less, is being altered, the requirements of i through iii below apply:	Thank you for the comment. Staff updated the adopted language to correct reference.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239047&DocumentContentId=72485

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239048.001	Owens Coming	We support the Commission's efficiency and carbon reduction goals for residential homes and nonresidential buildings. In doing so, it is critical that the Commission maintain the historical and well-established loading order of focusing on energy efficiency first, followed by renewables and associated technology. We believe energy efficiency, renewables and bolt-on technology, when applied in the proper balance are inherently complimentary. To achieve this complimentary equilibrium, the building envelope must be optimized to the maximum extent feasible. Only when viewed in this context and with proper weight given to sustainability concerns and thereby provide society and the industry with maximum value and performance. This is not an "either/or" conversation, but one of using optimized compliance paths to create an intelligent and predictable outcome in support of the Commission's stated goals.		7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.001	Owens Coming	We support the Commission's efficiency and carbon reduction goals for residential homes and nonresidential buildings. In doing so, it is critical that the Commission maintain the historical and well-established loading order of focusing on energy efficiency first, followed by renewables and associated technology. We believe energy efficiency, renewables and bolt-on technology, when applied in the proper balance are inherently complimentary. To achieve this complimentary equilibrium, the building envelope must be optimized to the maximum extent feasible. Only when viewed in this context and with proper weight given to sustainability concerns and thereby provide society and the industry with maximum value and performance. This is not an "either/or" conversation, but one of using optimized compliance paths to create an intelligent and predictable outcome in support of the Commission's stated goals.	Thank you for your comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.002	Owens Coming	1. We would like to reaffirm our 45-day language comments submitted on June 18, 2021.	Thank you for your comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.002	Owens Coming	1. We would like to reaffirm our 45-day language comments submitted on June 18, 2021.	Thank you for your comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.003	Owens Coming	2. Recommending an expansion of the buried ducts language and acceptable assemblies as follows: a. Remove the requirement for uniform insulation level across the attic plane for the Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.003	Owens Coming	2. Recommending an expansion of the buried ducts language and acceptable assemblies as follows: a. Remove the requirement for uniform insulation level across the attic plane for the Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.004	Owens Coming	b. Allow mounding of the insulation around the ducts for the Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.004	Owens Coming	b. Allow mounding of the insulation around the ducts for the Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.005	Owens Coming	c. Remove the requirement for a containment barrier for the Deeply Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.005	Owens Coming	c. Remove the requirement for a containment barrier for the Deeply Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484

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239048.006	Owens Coming	d. Allow mounding of the insulation around the ducts for the Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.006	Owens Coming	d. Allow mounding of the insulation around the ducts for the Buried Ducts option	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.007	Owens Coming	e. Consider conditions under which Buried Ducts and/or Deeply Buried Ducts offer equivalent performance to ducts in conditioned space	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.007	Owens Coming	e. Consider conditions under which Buried Ducts and/or Deeply Buried Ducts offer equivalent performance to ducts in conditioned space	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.008	Owens Coming	Initial justification for these buried duct recommendations include: • The CEC has not provided substantial reasoning for continuing its overly restrictive and arguably burdensome approach to buried ducts assemblies – while some advances were made in the 2019 energy code, we believe more should be done especially when considering trade labor constraints do not appear to be easing for the foreseeable future	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.008	Owens Coming	Initial justification for these buried duct recommendations include: • The CEC has not provided substantial reasoning for continuing its overly restrictive and arguably burdensome approach to buried ducts assemblies – while some advances were made in the 2019 energy code, we believe more should be done especially when considering trade labor constraints do not appear to be easing for the foreseeable future	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.009	Owens Coming	• The CASE Team should be directed to provide a review of current buried duct assemblies from both Prescriptive and Performance approaches for maximum efficiency gain and market flexibility	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.009	Owens Coming	• The CASE Team should be directed to provide a review of current buried duct assemblies from both Prescriptive and Performance approaches for maximum efficiency gain and market flexibility	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.01	Owens Coming	• Consistency with national model energy codes and recent state specific code adoptions such as one can find with the State of Oregon wherein: o No such additional restrictive criteria exist o The State of Oregon has recognized the performance of buried ducts as being equivalent to ducts in conditioned space under less restrictive criteria than even the model energy codes	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.010	Owens Coming	• Consistency with national model energy codes and recent state specific code adoptions such as one can find with the State of Oregon wherein: o No such additional restrictive criteria exist o The State of Oregon has recognized the performance of buried ducts as being equivalent to ducts in conditioned space under less restrictive criteria than even the model energy codes	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.011	Owens Coming	• Acknowledgement of existing strategies for mitigating any potential for wind washing of the mounded insulation such as baffles at roof vents or other techniques	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484

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239048.011	Owens Coming	<ul style="list-style-type: none"> Acknowledgement of existing strategies for mitigating any potential for wind washing of the mounded insulation such as baffles at roof vents or other techniques 	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.012	Owens Coming	<ul style="list-style-type: none"> Inclusion of other best practices to enhance the performance of a more traditional buried ducts approach including: <ul style="list-style-type: none"> Reasonable duct tightness expectations Insulation flags or markers to verify insulation depth and duct locations Specific modeling and inspection requirements for mechanical calculations to properly include ALL buried duct assembly factors to more accurately right-size equipment and distribution systems 	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239048.012	Owens Coming	<ul style="list-style-type: none"> Inclusion of other best practices to enhance the performance of a more traditional buried ducts approach including: <ul style="list-style-type: none"> Reasonable duct tightness expectations Insulation flags or markers to verify insulation depth and duct locations Specific modeling and inspection requirements for mechanical calculations to properly include ALL buried duct assembly factors to more accurately right-size equipment and distribution systems 	This is outside the scope of this rulemaking. It would more appropriate to evaluate in the 2025 Standard or as a compliance option	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239048&DocumentContentId=72484
239055.001	Philip Squair (National Electrical Manufacturers Association)	<p>1. We disagree with the decision to amend 45-day language to deny recognition of equivalency between Joint Appendix 8 and Title 20 qualified lamps for the purpose of conformance to Title 24. CEC should reverse its late-proceedings decision and restore line #5 of Table 150.0-A to recognize equivalency between Title 24 and Title 20 qualified products. As CEC stated in the Initial Statement of Reasons¹ for this proceeding, it is time for a "new generation of light source technologies for residential building lighting applications [to be] considered for their relevancy and physical characters". By striking former line #5, CEC is essentially stating that its Title 20 requirements are not sufficient to ensure quality in LED lighting appearance and/or performance. Furthermore, because a primary purpose of code amendment proposals should be to reduce confusion and to improve conformance and energy savings, formalizing a mismatch between Title 20 and Title 24 Light Sources would only serve to perpetuate confusion.</p>	<p>The two programs (T20 & T24 which include JA8) serve two different lighting market segments - one is for and about appliances (lamps) and the other is for new buildings, additions and alterations of buildings.</p> <p>With the removal of the most expensive and time-consuming of the JA8 test, it is expected significant cost of the JA8 test would no longer be there for JA8-compliant products and more competitive-priced products would be available to consumers. Based on the above, the Commission does not accept the comment suggestion.</p>	7/28/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=239055&DocumentContentId=72005

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239055.002	Philip Squair (National Electrical Manufacturers Association)	<p>2. Commenters to the 45-day Express Terms who argued against the recognition and acceptance of Title 20 certified lamps within Title 24 lack substantive evidence of any consumer issues that remain to be resolved by CEC action. Sales of Title 20 compliant lamps far exceed those of Title 24 compliant lamps. The lack of consumer complaints about performance of Title 20 products proves they are acceptable. In contrast, there will be a burden placed on consumers as a result of manufacturers having to maintain two separate product lines to satisfy Title 24 and Title 20 as well as increased potential for confusion among consumers and builders. It makes no sense for California to have one requirement for consumers and another for builders especially when the Title 20 requirements have been more than validated by market acceptance. Put another way, there is a burden associated with having two competing databases as well as confusion and costs associated with this practice. Unfortunately, this burden of the competing/conflicting databases will not be offset by any perceptible consumer benefit.</p>	<p>The comment suggests the lack of consumer complaints about Title 20 products proves they are acceptable - in terms of flicker reduction performance. Staff do not disagree that this could be the case for existing Title 20 compliant products on the market, however, there will be new products coming to the market as well as redesigned products coming out - those are covered by the JA8 regulatory scope would need to pass the JA8 flicker performance test to show that they meet the performance requirements.</p> <p>Secondly, the comment states there will be a burden placed on consumers as manufacturers have to maintain product lines for Title 24 and for Title 20. Staff disagree with the assessment as the two programs (T20 & T24 which include JA8) serve two different lighting market segments - one is for and about appliances (lamps) and the other is for new buildings, additions and alterations of buildings.</p> <p>Based on the above and also this rulemaking does not cover the Title 20 appliance program and its administration, and also there is insufficient evidential data available at this time to support the proposed changes, staff reverted the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.</p> <p>In response to this comment, the Commission decided not to modify existing 2019 language.</p>	7/28/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?nu=2384018;DocumentContentId=239055
239055.003	Philip Squair (National Electrical Manufacturers Association)	<p>3. For clearer recognition of products certified to the Title 20 Modernized Appliance Efficiency Database System (MAEDbS), after CEC restores the language of line #5, NEMA proposes the addition of the words "Title 20 LED Lamps listed in the MAEDbS" to Table 150.0-A.</p>	<p>The 15-day Table 150.0-A does not include changes to #5 of Table 150.0-A.</p> <p>Based on the above and also this rulemaking does not cover the Title 20 appliance program and its administration, and also there is insufficient evidential data available at this time to support the proposed changes, staff reverted the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.</p> <p>In response to this comment, the Commission decided not to modify existing 2019 language.</p>	7/28/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?nu=2384018;DocumentContentId=239055

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239055.004	Philip Squair (National Electrical Manufacturers Association)	4. Also in Table 150.0-A, NEMA opposes the proposed strikeout of the words "accent, display, utility, undercabinet or special effect" to line #2. This strikeout is related to the decision to maintain disagreement and confusion between Title 20 and Title 24 qualified light sources. Once CEC restores the 45-day proposal language to eliminate the mismatch between Title 20 and Title 24 light sources in response to our arguments above, these categories can be restored.	<p>As stated above and elsewhere, the two programs (Title 20 & Title 24 which include JA8) serve two different lighting market segments - one is for and about appliances (lamps) and the other is for new buildings, additions and alterations of buildings. There are clear distinctions between the two programs and also the qualified light sources of the two. Also the 45-day proposed change about inseparable solid state lighting luminaires providing accent, display, utility, undercabinet and special effect lighting, these lighting are not within the current scope of Title 20 but would likely affect Title 24.</p> <p>Likewise, the 45-day proposed change about color light sources are not within the current scope of Title 20 but would likely affect Title 24.</p> <p>Based on the above and also this rulemaking does not cover the Title 20 appliance program and its administration, and also there is insufficient evidential data available at this time to support the proposed changes, staff reverted the changes to Section 150.0(k)1B, Table 150.0-A, Section 160.5(a)1B and Table 160.5-A.</p> <p>In response to this comment, the Commission decided not to modify existing 2019 language.</p>	7/28/2021	45-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?DocID=239055&DocumentContentId=239055
239056.001	HVI	<p>Topic 1: Exhaust Fan Lighting</p> <p>1. General requirements: Within Table 100.0-A, the 45-day language added requirements for indoor lighting of single-family dwelling units to comply with Section 130.0. However, the scope of Section 130.0(a) does not include indoor lighting of single-family dwelling units. For consistency, please modify Table 100.0-A as follows:</p>	<p>The comment stated that the Single Family is added to Table 100.0-A in the 45-day language and also added the requirement for single family dwelling units to comply with Section 130.0.</p> <p>In Table 100.0-A of the 45-day language, the term "Low-rise Residential" occupancy is replaced by "Single-Family" occupancy and there is no change to the mandatory section requirement in the Table for "Single-Family" occupancy. In Section 130.1(b) there are a number of listed occupancies, including fire station dwelling and hotel and motel guest rooms that are also considered to be single-family occupancy and thereby the Table 100.0-A information is correct. Staff do not find the Table 100.0-A information necessary to be revised for the comment's suggestion.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?DocID=239056&DocumentContentId=72492

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239056.002	HVI	<p>2. Dimming controls: CEC's proposed revisions to Sections 150.0(k)2F and 160.5(a)2F will introduce a new requirement for all range hoods lighting to be provided with dimming controls. Any such proposal should be accompanied by a cost effectiveness study in compliance with the WarrenAlquist Act; however, HVI is not aware of any cost effectiveness study to support the requirement to provide range hood lighting with dimming controls. Range hood lighting differs from general lighting in the following ways:</p> <p>a. Range hood lighting is used for task lighting during cooking, when brightness is often desired.</p> <p>b. Controls for range hood lighting are typically located on the device, limiting the ability to use after-market, wall-mounted dimming controls.</p> <p>c. Range hood lighting is subject to higher temperatures which restricts the selection of high efficacy lighting that can be used for this application.</p> <p>d. In many cases, range hood lighting is provided with two or more brightness levels, but dimming controls are very rare.</p>	<p>Section 150.0(k)2F and 160.5(a)2F do not apply to appliance based lighting; otherwise a different requirement from the proposed one would be laid out to require an additional dimming control to interface with the appliance controls and it would further require an additional interface between the wall-mounted control and the appliance control to control the appliance lighting.</p> <p>The dimming control requirements of Section 150.0(k)2F and 160.5(a)2F apply to lighting in the specified spaces but do not apply to appliance lighting such as kitchen hood lighting or exhaust hood lighting - as these appliance lighting already have the built-in appliance controls to control the lighting.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.003	HVI	<p>Finally, if CEC introduces dimming control requirements for range hoods in addition to the new requirements for range hood capture efficiency, the number of compliant products will be severely restricted. The CASE team's estimate of incremental costs for introducing capture efficiency requirements for range hoods did not take dimming requirements into consideration. For these reasons, please exempt range hoods from the dimming controls requirements.</p> <p>3. Lighting requirements for alterations: Section 150.2(b)1K (Section 180.2(b)4A for multifamily) requires altered luminaires to meet the requirements of Section 150.0(k) (Section 160.5(a) for multifamily) and Table 150.0-A (Table 160.5-A for multifamily). However, Section 150.0(k)1A (Section 160.5(a)1A for multifamily) provides exceptions for compliance with Table 150.0-A (Table 160.5-A for multifamily) in certain cases, including exhaust fan lighting. This exception is especially important for range hood lighting that is subjected to higher environmental temperatures than general lighting and for which high efficacy options are significantly restricted. For consistency, and because no cost-effectiveness study was presented to remove these exceptions in the case of alterations, please extend the same exceptions to these sections by only requiring compliance with Table 150.0-A through reference to Section 150.0(k), as follows (similar change proposed for Section 180.2(b)4A): Lighting. The altered lighting system shall meet the lighting requirements of Section 150.0(k). The altered luminaires</p>	<p>Staff finds that the language in question does not impose the requirement that is of concern to the commenter. Sections 150.0(k)2F and 160.5(a)2F do not apply to appliance lighting. These are expressly luminaire requirements and do not apply to incidental task lighting provided by non-lighting appliances - the lighting in refrigerators and in ranges is similarly not required by this language to have wall-mounted controls or dimming controls.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.004	HVI	<p>Topic 2: Range Hood Capture Efficiency</p> <p>Conceptually, HVI supports CEC's proposed requirements to establish a minimum range hood capture efficiency (RHCE) with the option to comply using a proxy airflow during this cycle. However, CEC's RHCE targets were developed by LBNL assuming that the minimum RHCE should be determined based on the exposure for a person somewhere else in the home besides the kitchen (i.e., assuming that the home is a well-mixed zone). This approach significantly underestimates the exposure for those in proximity to cooking – especially the exposure for the cook. To provide adequate protection for the cook, regardless of the size of the dwelling unit that the cook happens to be in, it is prudent to establish a minimum RHCE/proxy airflow that is at the higher end of the range that LBNL recommended based on dwelling unit size. HVI requests that CEC modify Table 150.0-G to use the following values for RHCE and proxy airflow within this cycle. Please see 19-BSTD-03 TN# 235643, "Home Ventilating Institute Comments - Response to CEC's Nov 3 Proposal to Establish Minimum Capture Efficiency for Range Hoods" and 19-BSTD-03 TN# 236371, "HVI Comments on 2022 Energy Code Pre-Rulemaking," for a detailed justification supporting this recommendation:</p> <ul style="list-style-type: none"> • Electric cooking: RHCE ≥ 65% or airflow ≥ 160 cfm • Gas cooking: RHCE ≥ 80% or airflow ≥ 250 cfm 	<p>Section 150.0(k)2F and 160.5(a)2F do not apply to appliance based lighting; otherwise a different requirement from the proposed one would be laid out to require an additional dimming control to interface with the appliance controls and it would further require an additional interface between the wall-mounted control and the appliance control to control the appliance lighting.</p> <p>The dimming control requirements of Section 150.0(k)2F and 160.5(a)2F apply to lighting in the specified spaces but do not apply to appliance lighting such as kitchen hood lighting or exhaust hood lighting - as these appliance lighting already have the built-in appliance controls to control the lighting.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.005	HVI	<p>Topic 3: Verification of Airflow by the System Installer</p> <p>CEC has proposed to modify ASHRAE 62.2 to restrict the methods of ventilation airflow verification by the system installer. HVI opposes these modifications on the grounds that no performance data have been presented to demonstrate that IAQ is compromised by following the 62.2 verification options or to substantiate restricting ASHRAE 62.2 options. If IAQ is not affected by these changes, then CEC should demonstrate cost-effectiveness of these proposed modifications in accordance with the Warren-Alquist Act; no such cost-effectiveness study has been presented. As such, HVI requests that CEC continue to align Title 24's airflow verification requirements with ASHRAE 62.2. The following modifications are proposed in this regard:</p>	<p>The Standards adopt sections of ASHRAE 62.2 by reference and includes amendments as specified. This can be found in the opening language of Section 150.0(o). The Standards does not propose to modify ASHRAE 62.2.</p> <p>The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. The commenter's proposal is a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, and thus should not be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.006	HVI	<p>1. Manufacturer design criteria. ASHRAE Section 5.4 permits "manufacturer design criteria (to be used) in place of a measurement" when verifying local exhaust airflows. Until data are presented that demonstrate that these options compromise IAQ, please modify Sections 150.0(o)1Gv and 160.2(b)2Ave to provide the option for manufacturer design criteria to be used for verifying local exhaust airflows. The following language is offered for CEC's consideration: 150.0(o)1Gv, new subsection "c" (similar change recommended for 160.2(b)2Ave): As an alternative to performing an airflow measurement of the system as installed in the dwelling unit, compliance may be demonstrated by installing an exhaust fan and duct system that conforms to manufacturer's sizing instructions. Manufacturer sizing instructions shall verify that the duct sizing uses the calculation methodology identified in HVI 920 Table A11, with the exception that the field-installed duct length and number of elbows shall be used. Visual inspection shall verify the installed system conforms with the duct length, diameter, and number of elbows used within the manufacturer's sizing instructions and that the duct system has an exterior termination fitting with a hydraulic diameter greater than or equal to the minimum duct diameter.</p>	<p>The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. The commenter's proposal is a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, thus should not be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239056&DocumentContentId=72492
239056.007	HVI	<p>2. Manufacturer installation instructions for measurement. ASHRAE 62.2 Section 4.3 permits ventilation airflows to "be measured according to the ventilation equipment manufacturer installation instructions" and also permits measurement by "using a flow hood, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals/grilles, outlet terminals/grilles, or in the connected ventilation ducts." CEC has removed the options to "measure according to the ventilation equipment manufacturer installation instructions" and to take measurements "in the connected ventilation ducts." No data have been presented on IAQ effects or cost-effectiveness associated with these modifications. In the absence of such data, HVI requests that CEC retain these options provided by the consensus standard. The following modifications are offered for CEC's consideration in this regard:</p>	<p>The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. Based on staff's analysis, the comment's proposal would inappropriately delegate authority for determining field verification compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, and thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239056&DocumentContentId=72492

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239056.008	HVI	a. Section 150.0(o)1Gva (similar change recommended for 160.2(b)2Avie1): The system installer shall measure the airflow by using a flow hood, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals/grilles, or outlet terminals/grilles, or at another location between the inlet and outlet terminals/grilles as specified by the manufacturer in accordance with the procedures in Reference Residential Appendix RA3.7...	The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. Based on staff's analysis, the proposal would inappropriately delegate authority for determining field verification compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, and thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.009	HVI	b. Section 150.0(o)1H (similar change recommended for 160.2(b)2Avii): The airflow required by section 150.0(o)1C (is the quantity of outdoor ventilation air supplied or indoor air exhausted by the mechanical ventilation system as installed and shall be measured by using a flow hood, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals/grilles, or outlet terminals/grilles, or at another location between the inlet and outlet terminals/grilles as specified by the manufacturer in accordance with the procedures in Reference Residential Appendix RA3.7...	The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. Based on staff's analysis, the proposal would inappropriately delegate authority for determining field verification compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, and thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.010	HVI	c. RA3.7.2.2 Airflow Rate Measurements (similar change recommended for NA2.2.2.2): ...Airflows shall be measured at the mechanical ventilation fan's inlet terminals/grilles, or outlet terminals/grilles, or at another location between the inlet and outlet terminals/grilles as specified by the manufacturer	The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. CEC staff understands the proposal inappropriately delegates authority for determining field verification compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, and thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.011	HVI	<p>d. RA3.7.3 Diagnostic Apparatus for Measurement of Ventilation System Airflow (similar change recommended for NA2.2.3): ...The airflow rate measurement apparatus manufacturers shall publish in their product documentation, specifications for how their airflow measurement apparatuses are to be used for accurately measuring residential mechanical ventilation system airflow at system inlet or outlet terminals/, grilles, outlet terminals/grilles, or at another location between the inlet and outlet terminals/grilles as specified by the manufacturer or registers of single or multiple branch ventilation systems....(b) The product manufacturers' product documentation that gives the specifications for use of the airflow measurement apparatuses to accurately measure residential mechanical ventilation system airflow at system inlet or outlet terminals/, grilles, outlet terminals/grilles, or at another location between the inlet and outlet terminals/grilles as specified by the manufacturer or registers of single or multiple branch ventilation systems.</p>	<p>The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. Based on staff's analysis, the proposal would inappropriately delegate authority for determining field verification compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, and thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.012	HVI	<p>e. ASHRAE 62.2's approval of ventilation verification that is "measured according to the ventilation equipment manufacturer installation instructions" allows for onboard airflow measurement devices. Such equipment is not permitted by the draft express terms, but again, no data have been presented on IAQ effects or cost-effectiveness associated with these proposed CEC modifications of ASHRAE 62.2. In the absence of such data, HVI requests that CEC retain this option provided by the consensus standard. Initial field testing from HVI's membership has indicated that such equipment can be more accurate than passive flow hoods that CEC currently approves for use in verifying ventilation system airflow. Following is language that is offered in this regard (similar change recommended for Section NA2.2.3.4):</p> <p>RA3.7.3.4 Onboard Airflow Measurement Device. An instrument that is provided by the ventilation fan manufacturer, integrated with the ventilation fan, and designed for measurement of residential ventilation exhaust or supply airflows that meets the applicable instrument accuracy specifications in RA3.7.2 may be used to measure the mechanical exhaust or supply ventilation airflow.</p>	<p>The comment proposes to exempt ventilation systems from existing field verification and proposes to instead demonstrate field verification compliance for those systems using vaguely described means devised by the manufacturer that are unknown to CEC staff, that are not regulated by the Energy Code, and apparently are not rated in accordance with any performance standard. Based on staff's analysis, the proposal would inappropriately delegate authority for determining field verification compliance to the whim of the manufacturer instead of following established Title 24 field verification protocols. The commenter proposes a substantive change that has not been vetted at any of the workshops for the 2022 CA Title 24, Part 6 update, and thus cannot be considered to be added to the proposed express terms at the 15-day review stage of the rulemaking. Staff could consider proposals to approve new field verification technology or protocols as part of the 2025 update to the California energy code.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.013	HVI	3. Prescriptive duct sizing. HVI supports CEC's decision to maintain the ASHRAE 62.2 option to use prescriptive duct sizing to verify the local exhaust airflow associated with a range hood capture efficiency target. However, CEC should ensure that this option is used only to the extent that it is supported by physics (i.e., only when the rated airflow is determined at a static pressure of 0.25 in. w.g. or higher, in accordance with 62.2 Section 5.4). For example, a rated airflow that is determined at a lower static pressure (e.g., 0.1 in. w.g.) would need a larger duct diameter than shown in the 0.25 in. w.g. table to maintain that airflow under the conditions assumed in the table. This can be demonstrated through application of the Darcy Colebrook equations provided in the ASHRAE Handbook of Fundamentals. Physics therefore supports removal of the following exception to the prescriptive duct sizing table proposed by CEC in the draft express terms as follows:	Staff notes that the referenced requirements in the comment to Section 150.0(o)1Gv is applicable to airflow measurement done by the system installer, not HERS. As an alternative to using an airflow measuring device (Section 150.0(o)1Gva), the installer can demonstrate compliance by following Section 150.0(o)1Gvb. Staff determined that the adopted language is more clear as-is versus the commenter's proposed strikeout of "...a static pressure greater than or equal to 0.25 in. of water shall not be required..." when capture efficiency is used.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.014	HVI	a. Section 150.0(o)1Gv (similar change proposed for Section 160.2(b)2Avie): When using Table 150.0-H for demonstrating compliance, the airflow rating shall be greater than or equal to the value required by Section 150.0(o)1G at a static pressure greater than or equal to 0.25 in. of water (62.5 Pa). When a vented range hood utilizes a capture efficiency rating to demonstrate compliance with 150.0(o)1Giib, a static pressure greater than or equal to 0.25 in. of water at the rating point shall not be required, and the airflow listed in the approved directory corresponding to the compliant capture efficiency rating point shall be applied to Table 150.0-H for determining compliance.	Staff notes that the referenced requirements in the comment to Section 150.0(o)1Gv is applicable to airflow measurement done by the system installer, not HERS. As an alternative to using an airflow measuring device (Section 150.0(o)1Gva), the installer can demonstrate compliance by following Section 150.0(o)1Gvb. Staff determined that the adopted language is more clear as-is versus the commenter's proposed strikeout of "...a static pressure greater than or equal to 0.25 in. of water shall not be required..." when capture efficiency is used.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.015	HVI	b. Table 150.0-H footnote f (similar change proposed for Table 160.2-H): When a vented range hood utilizes a capture efficiency rating to demonstrate compliance with 150.0(o)1Giib, a static pressure greater than or equal to 0.25 in. of water at the rating point shall not be required, and the airflow listed in the approved directory corresponding to the compliant capture efficiency rating point shall be applied to Table 150.0-H for determining compliance.	Staff notes that the referenced requirements in the comment to Section 150.0(o)1Gv is applicable to airflow measurement done by the system installer, not HERS. As an alternative to using an airflow measuring device (Section 150.0(o)1Gva), the installer can demonstrate compliance by following Section 150.0(o)1Gvb. Staff determined that the adopted language is more clear as-is versus the commenter's proposed strikeout of "...a static pressure greater than or equal to 0.25 in. of water shall not be required..." when capture efficiency is used.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.016	HVI	c. RA3.7.4.3 (similar change proposed for Section NA2.2.4.1.4): ...The verification procedure shall consist of visual inspection of the installed kitchen range hood to verify and record the following information: ... (c) The rated airflow value or rated capture efficiency value listed in the HVI, AHAM, or other CEC-approved directory. If the prescriptive duct sizing method in 150.0(o)1Gvb is used by the installer to verify the airflow value, then the rated airflow value shall be verified using the approved directory at a static pressure difference of 0.25 in. of water.	Staff notes that the referenced requirements in the comment to Section 150.0(o)1Gv is applicable to airflow measurement done by the system installer, not HERS. As an alternative to using an airflow measuring device (Section 150.0(o)1Gva), the installer can demonstrate compliance by following Section 150.0(o)1Gvb. The comment proposes to revise HERS verification protocols in the reference appendices based on installer verification requirements, which is not appropriate.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.017	HVI	<p>4. Prescriptive duct sizing alternative. In addition to the manufacturer design criteria option presented earlier in this comment, HVI's nominal installed airflow (NIA) method provides another option for physics-based prescriptive duct sizing. HVI 920 has provisions for the calculation of NIA, which is the prescriptive airflow that is expected in a typical duct system that complies with the specifications of HVI 920 Table A11.1. The following language is offered for CEC's consideration (as new subsection to Sections 150.0(c)1Gv and 160.2(b)2Avie) to provide a physics based prescriptive duct sizing option for rated airflows that are not determined at a static pressure of 0.25 in. w.g. or greater:</p> <p>[New subsection "d".] As an alternative to performing an airflow measurement of the system as installed in the dwelling unit, compliance may be demonstrated for a range hood and duct system that complies with this section. The rated airflow used for compliance shall be a nominal installed airflow determined in accordance with HVI 920. Visual inspection shall verify the installed system has a duct length that does not exceed 10 feet, has a duct hydraulic diameter and exterior termination fitting hydraulic diameter that is greater than or equal to the diameter associated with the rated nominal installed airflow, and has no more than 3 elbows.</p>	<p>Staff appreciates and notes the comment. Staff understands that the specific details for nominal installed airflow (NIA) that the directories will publish are still in the process of being refined in industry working groups attended by stakeholders. Staff could consider proposals as part of a future update to the California energy code once information is more developed.</p>	7/28/2021	15-Day	<p>https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492</p>
239056.018	HVI	<p>Topic 4: Makeup Air CEC has introduced requirements for makeup air that are restricted to kitchen exhaust hoods. As stated in prior comments, HVI supports requirements for makeup air that are applied equally to all exhaust ventilation systems, with alternative compliance paths provided for systems that do not readily accommodate MERV 13 filtration for makeup air (i.e., for systems such as exhaust-only dwelling unit ventilation and whole-house fans). Understanding that CEC will not likely be able to accommodate equivalent provisions for systems such as exhaust-only dwelling unit ventilation and whole-house fans within this cycle, HVI requests that CEC address them in the next cycle. Within this cycle, HVI requests that CEC apply the makeup air requirements equally across all kitchen exhaust systems (e.g., hoods, wall-mount, ceiling-mount, downdraft, etc.). This could be accomplished with the following modification to the definition of makeup air:</p> <p>AIR, MAKEUP, or Compensating Outdoor Air is outdoor air that is intentionally conveyed by openings or ducts into the building from the outside; is supplied to the vicinity of a kitchen exhaust inlet hood; and replaces air, vapor and contaminants being exhausted by the kitchen exhaust inlet hood. Makeup air is generally filtered and fan-forced, and it may be heated or cooled. Makeup air may be delivered through openings or ducts integral to an the exhaust hood system.</p>	<p>The Section 100.1 definition for makeup air provides specific direction for supply in the vicinity of an exhaust hood which minimizes the need to expend energy to condition the outdoor air introduced by the makeup air fan. ASHRAE 62.2 requires the compensating outdoor air to be interlocked with the exhaust hood. HVI has proposed a substantive change to the definition of makeup air that would abandon these and other constraints on makeup air systems that would result in higher energy impacts and possibly negative IAQ impacts for the dwelling unit. The HVI proposed change of the makeup air definition should be proposed as a change at the beginning of the next update to the Standards to develop the record and in order for the energy and IAQ impacts of the proposal to be vetted by stakeholders.</p>	7/28/2021	15-Day	<p>https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492</p>

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239056.019	HVI	<p>Topic 5: Filtration HVI supports CEC's expansion of its outdoor air filtration requirements to include makeup air and requests that CEC provide further clarification regarding when filtration is required for integrated systems. Specifically, when a ventilation system supplies outdoor air through a heating or cooling system's MERV 13 filter prior to its introduction into the breathing zone, there is no need to provide an additional MERV 13 filter for the ventilation system. Clarifying this exception will reduce fan power, fan noise, first-costs, and maintenance costs while still delivering the intended IAQ. CEC's prior study to support the MERV 13 filtration of outdoor air did not propose or provide a case for double filtration, so please clarify the language to align with CEC's original intent in this regard. The following language is offered as a modification to Section 150.0(m)12A for this purpose (similar change recommended for Section 160.2(b)1A):</p> <p>EXCEPTION 2 to Section 150.0(m)12A: Systems specified in Section 150.0(m)12Ai that are integrated with the duct system of a space conditioning system such that the outdoor air passes through the space conditioning system's air filter prior to introduction to the occupiable space are exempt from the air filtration requirements in Section 150.0(m)12.</p>	<p>As specified in Sections 150.0(m)12A and 160.2(b)1A: MERV 13 filtration is required for supply ventilation systems including makeup supply systems and for the supply side in a balanced HRV/ERV ventilation system. Sections 150.0(m)12Bi and 160.2(b)1Bi state that the system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through any system's thermal conditioning components. There are no requirements for pre-filtering ventilation air prior to MERV 13 filtration, or double-filtration of ventilation air. Makeup air systems are a special case supply ventilation system type that are required to be located in the vicinity of an exhaust hood and expected to be interlocked with the exhaust system.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.020	HVI	<p>Topic 6: Fan Efficacy Determination HVI supports the alignment of cost-effective fan efficacy requirements and appreciates CEC's modifications within the 15-day language that help clarify how to determine fan efficacy for H/ERVs. Section 170.2(c)3Bivc of the 15-day language also establishes a new requirement for fan efficacy for balanced ventilation systems without heat or energy recovery; consequently, the guidance in RA3.7.4.4.3 and NA2.2.4.1.5.3 should be expanded to include the procedure for determining fan efficacy for these systems. There are basically two types of in-suite balanced ventilation systems that are not H/ERVs: "integrated supply and exhaust ventilator" (a product class recognized by HVI 920 that is essentially a single box with a supply and exhaust component) and balanced systems composed of separate but interlocked supply and exhaust systems. The following modifications are proposed to Section RA3.7.4.4.3 (similar changes recommended to NA2.2.4.1.5.3) to clarify how fan efficacy should be determined for each of these system types:</p>	<p>Verification protocols for fan efficacy for systems other than HRV/ERVs were not previously proposed for the 2022 update to Title 24 Part 6. Staff cannot introduce new ratings requirements and verification protocols as revisions for the 15-day language. However, staff could consider proposals for new ratings requirements and verification protocols for systems other than HRV/ERV systems as part of the 2025 Title 24 Part 6 rulemaking.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.021	HVI	<p>1. New section c for integrated supply and exhaust ventilator: If compliance with a fan efficacy performance rating (w/cfm) is required for a balanced, integrated supply and exhaust ventilator without heat or energy recovery, then determine and record the fan efficacy rating for the installed model using the model details in the energy ratings in the HVI or other CEC-approved directory in accordance with steps a, b, and c below.</p> <p>a. Record the required ventilation airflow (cfm) for the integrated supply and exhaust ventilator as specified on the certificate of compliance.</p> <p>b. From the energy ratings in the HVI or other CEC approved directory, determine, and record the rated Power Consumed (Watts), at the closest Net Airflow (cfm) listed in the directory that is greater than or equal to the ventilation airflow (cfm) required on the certificate of compliance. Alternatively, linear interpolation of the directory ratings shall be allowed if the interpolated value is calculated based on a Net Airflow (cfm) that is equal to the ventilation airflow (cfm) required on the certificate of compliance. Interpolation shall be in accordance with equation RA3.7-2. Extrapolation of the directory ratings shall not be allowed. Equation RA3.7-2 $pc = pc1 + [(na - na1) / (na2 - na1)] \times (pc2 - pc1)$ where: na is the known value for Net Airflow equal to the ventilation airflow required on the certificate of compliance, pc is the unknown value for Power Consumed (Watts), na1 and pc1 are the closest rated values for</p>	<p>Verification protocols for fan efficacy for systems other than HRV/ERVs were not previously proposed for the 2022 update to Title 24 Part 6. Staff cannot introduce new ratings requirements and verification protocols as revisions for the 15-day language. However, staff could consider proposals for new ratings requirements and verification protocols for systems other than HRV/ERV systems as part of the 2025 Title 24 Part 6 rulemaking.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.022	HVI	<p>2. New section d for a balanced system composed of separate but interlocked supply and exhaust systems: If compliance with a fan efficacy performance rating (w/cfm) is required for a balanced system composed of separate but interlocked supply and exhaust systems without heat or energy recovery, then determine and record the fan efficacy rating for the installed system using the model details in the energy ratings in the HVI or other CEC-approved directory in accordance with steps a, b, and c below.</p> <p>a. Record the required ventilation airflow (cfm) for the balanced system as specified on the certificate of compliance.</p> <p>b. From the energy ratings in the HVI or other CEC approved directory, for both the exhaust system and supply system components, determine and record the rated Input Power (Watts), at the closest Rated Airflow (cfm) listed in the directory that is greater than or equal to the ventilation airflow (cfm) required on the certificate of compliance. Alternatively, linear interpolation of the directory ratings shall be allowed if the interpolated value is calculated based on a Rated Airflow (cfm) that is equal to the ventilation airflow (cfm) required on the certificate of compliance. Interpolation shall be in accordance with equation RA3.7-3. Extrapolation of the directory ratings shall not be allowed. Equation RA3.7-3 $ip = ip1 + [(ra - ra1) / (ra2 - ra1)] \times (ip2 - ip1)$ where: ra is the known value for Rated Airflow equal to the ventilation airflow required on the</p>	<p>Verification protocols for fan efficacy for systems other than HRV/ERVs were not previously proposed for the 2022 update to Title 24 Part 6. Staff cannot introduce new ratings requirements and verification protocols as revisions for the 15-day language. However, staff could consider proposals for new ratings requirements and verification protocols for systems other than HRV/ERV systems as part of the 2025 Title 24 Part 6 rulemaking.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.023	HVI	<p>Additionally, please note the following erratum that should be corrected within Section RA3.7.4.4.3 (similar changes recommended to NA2.2.4.1.5.3):</p> <p>c. Divide the value for Power Consumed (Watts) recorded in step b, by the Net Airflow (cfm) used in step b to determine Power Consumedfan efficacy.</p>	Staff agrees with commentator and will make this change in the next code cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.024	HVI	<p>Topic 7: Central Fan Integrated Systems Of the several topics referenced in this letter, this one may have the greatest effect on energy use of an individual dwelling unit. CEC's proposed changes to the draft express terms will require the operation of any ventilation system that is integrated with a space conditioning system's ducts to trigger the operation of the space conditioning system's fan. HVI is not cognizant of any consensus standard or model code that supports this proposed requirement. Additionally, HVI estimates the typical energy penalty associated with this requirement to be roughly 1,700 kWh annually per dwelling unit1 – an enormous penalty that is comparable to adding ~4 refrigerators2 to any home. Despite this large impact and despite this proposal going far beyond the requirements of any known consensus standard or model code, CEC has not provided an energy impact analysis, cost effectiveness analysis, or IAQ analysis to support this proposed change. CEC would reject any proposal from the public that did not provide such an analysis. HVI urges the commission to conduct such an analysis in accordance with the WarrenAlquist Act and to provide results for public review prior to making such a significant change to a very common installation configuration. As with the central fan interlock issue, CEC's proposal to introduce requirements for motorized dampers on central fan integrated ventilation systems was not accompanied by an IAQ or cost-effectiveness analysis and should be tabled until such an analysis is provided. If CEC elects to move forward without providing such an analysis for central fan interlock and for</p>	The adopted changes to CFI ventilation system do not change the effect of the existing (2019) definition. A CFI (central fan integrated) ventilation system is a ventilation system configuration in which the ventilation ductwork is connected to (has been integrated with) the duct system of a dwelling unit space conditioning system to enable distribution of ventilation air to the dwelling unit while the space conditioning system air handling unit (central fan) is operating. Based on staff's analysis, the commenter's claim that the term CFI ventilation system does not apply to all system configurations that integrate ventilation ductwork with a central space conditioning system's ductwork is not correct. See staff responses to each additional comment below.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.025	HVI	<p>1. Motorized Dampers – Clarifications: Please clarify that a motorized damper that is integral to a ventilation system can meet the requirement for a motorized damper in Sections 150.0(o)1Biii. For such systems, there is no need to have an additional damper "installed on the connected ventilation duct(s)."</p>	The clarifications in sections 150.0(o)1B and 160.2(b)2Aii specify that the damper shall be installed on the ventilation ducts. Specification for use of dampers integral to a ventilation system air handling unit are not given explicitly and staff determined such explicit specification to be unnecessary.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.026	HVI	<p>2. Motorized Dampers - Recommended Exceptions: Motorized dampers can effectively reduce leakage through outdoor air versus gravity dampers in certain situations, such as when the ventilation system is off and when the central air handler's induced pressure would cause the gravity damper to open during operation. However, there are cases when there is no added value associated with specifying a motorized damper, such as:</p> <p>a. Where the ventilation system's discrete fan is designed to operate continuously,</p> <p>b. Where a gravity damper is provided on an outdoor air duct connected to the central air handler's supply duct, or</p> <p>c. Where a gravity damper is provided on an exhaust duct connected to the central air handler's return duct.</p> <p>d. Where a gravity damper is provided on an outdoor air duct connected to the central air handler's return duct and such gravity damper is provided with a mechanism that prevents its opening under the design negative static pressure of the central air handler's return duct. For example, some ventilation fan manufacturers provide integral gravity dampers with magnets that can be used for this purpose. Dampers held closed by such magnets open at static pressures that are expected to be beyond that which would be experienced during the run time of</p>	<p>Response to a: The Standards do not allow CFI ventilation systems to operate continuously.</p> <p>Response to b: Since CFI systems are not allowed to operate continuously, this system configuration would need a controlled motorized damper to prevent introduction of outdoor air into the space conditioning system ducts when the space conditioning system is not operating.</p> <p>Response to c: This damper arrangement would fail a duct leakage test. Taping off ventilation openings is not allowed for space conditioning system duct leakage testing.</p> <p>Response to d: The CA Energy Code residential compliance manual and compliance documents have long directed that a controlled motorized damper be used when ventilation air is ducted into a space conditioning system duct system. A controlled motorized damper is necessary in order to only allow ventilation airflow to enter the space conditioning system when ventilation airflow is required for compliance with the standards. When the central fan operates for extended periods to handle heavier conditioning loads the ventilation air required may be satisfied prior to the point that space conditioning system meets the thermostat setpoint.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.027	HVI	<p>3. Damper Control – Recommended Exception: Generally speaking, the requirements in Section 150.0(o)1B.iii to close dampers when the ventilation system is not operating and open dampers when the ventilation system is operating are good practice. However, this section (perhaps inadvertently) prohibits H/ERVs from using recirculation defrost when connected to a duct system serving a space conditioning system. Such a condition is not expected to occur frequently, especially for systems specified in California, and when there is a need to defrost an H/ERV, recirculation defrost will result in lower contributions to peak power than electric resistance defrost. To ensure that such recirculation defrost H/ERVs, which represent the vast majority of H/ERVs available in North America, can continue to be used and integrated with central air handler ducts in California, HVI offers the following options for CEC's consideration:</p> <p>a. Retain the previous definition of the VENTILATION SYSTEM, CENTRAL FAN INTEGRATED, or CFI within Section 100.0 to exclude discrete ventilation systems with dedicated fans from the definition,</p> <p>b. Provide an interpretation to confirm that an "outdoor air fan" is not considered an "outdoor air fan" for an H/ERV during recirculation defrost, or</p> <p>c. Change 150.0(o)1Biii as follows: "...If the outdoor airflow for</p>	<p>Staff understands the 2019 version of the section 100.1 definition for CFI is applicable to any CFI configuration regardless of whether or not the ventilation air ducted to the space conditioning system is fan powered, thus the 2022 update clarifies but does not change the effect of the CFI definition. Staff understands there are alternative ventilation duct configurations that induce ventilation air into the airflow of a central space conditioning system but do not directly connect to the space conditioning system ducts and instead provide ventilation supply through a dedicated ventilation-only supply register placed adjacent to the space conditioning system's return grille that will provide the same performance as CFI and avoid use of dampers and damper controls. Thus, there are alternatives available that address the commenter's concern for recirculation defrost.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239056.028	HVI	<p>4. Central Air Handler Interlock – Recommended Exceptions: Central air handler interlock with a ventilation system that uses a discrete fan to supply outdoor air to a central air handler’s duct system can provide an effective means for controlling the direction and distribution of outdoor airflow. However, interlocking the operation of the central air handler is not required to accomplish these ends in all cases. For example, the following configurations can provide effective means of accomplishing these ends while saving hundreds to thousands of annual kilowatt-hours of central fan energy consumption per dwelling unit:</p> <p>a. Where an outdoor air supply duct is routed to the central air handler return duct, upstream of the central air handler filter; the instantaneous or design condition ventilation supply air temperature is no less than the minimum return temperature permitted by the manufacturer of any furnace connected to the central air handler return; and there is no H/ERV exhaust ducted to the central air handler return.</p> <p>b. Where an outdoor air supply duct with an integral MERV 13 filter is routed to the central air handler return duct, downstream of the central air handler filter; the instantaneous or design condition ventilation supply air temperature is no less than the minimum return temperature permitted by the manufacturer of any furnace connected to the central air handler return; and the H/ERV exhaust is not ducted to the</p>	<p>Staff understands that space conditioning system manufacturers specify minimum return air temperatures that are higher than the colder outdoor air temperatures in some climates, and there are no provisions in Energy Code to ensure there would be no violation of the manufacturer’s specified minimum temperature other than to ensure the ventilation air is mixed with space-conditioned airflow while the space conditioning system is operating. If outdoor ventilation air is supplied to a duct or plenum of a space conditioning system that is not operating, it will not be mixed or distributed throughout the dwelling unit, and it will flow directly through the nearest supply or return register/grille, which may involve flow through the conditioning coil for the space conditioning system. Staff understands there are alternative ventilation duct configurations that induce ventilation air into the airflow of a central space conditioning system but do not directly connect to the space conditioning system ducts; and instead provide ventilation supply through a dedicated ventilation-only supply register placed adjacent to the space conditioning system’s return grille which will better facilitate verification of airflows, and provide the same performance as CFI while avoiding the need for dampers, damper controls, or interlocking the ventilation system operation with the space conditioning system operation. Verification of ventilation airflow can be difficult or impossible when ventilation ducts are connected to a space conditioning system duct or plenum, thus ventilation-only supply registers that are separate from the space</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492
239056.029	HVI	<p>Topic 8: H/ERV Requirements HVI supports CEC’s proposed requirements for H/ERVs for multifamily dwelling units in the prescriptive path. In alignment with the charge of the Warren-Alquist Act, HVI recommends that CEC expand the prescriptive path requirements for H/ERVs to all climate zones and multifamily building types where they were demonstrated by the CASE team to be cost effective. There were 6 multifamily building prototypes and location combinations for which the specification of H/ERVs was determined to be cost effective but for which neither CASE nor CEC proposed to require H/ERVs within the prescriptive path. For detailed information, please see HVI’s comment number III.5 submitted under 19-BSTD-03 within TN# 237402. Additionally, HVI requests that in future cycles, CEC consider expanding the multifamily prescriptive requirement into more climate zones, consider adding a prescriptive requirement for singlefamily homes, and, when conducting building energy simulations to support these measures, modify the simulation thermostat setpoints to align more closely with those used in other codes and standards (i.e., ASHRAE 90.1 and IECC) and observed in California homes3 .</p>	<p>Staff notes that this comment is not consistent with the multifamily CASE report that was presented at public workshops and presented in 45-day language, and staff determined that the adopted language is appropriate. Staff could consider this comment’s proposal with the 2025 update to the Energy Code.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239056&DocumentContentId=72492

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239058.001	Jeff Stein	We support the changes to the Fan Power Limits in Section 140.4(c). We would have preferred that the fan power allowances been the more stringent values included in the CASE Report. In our experience, when engineers follow good practices in duct design and product selections, those values can be met easily. We had suggested the CASE team propose lower allowances. However, we recognize that even the looser values presented in the 15-day language will provide significant energy savings, mainly due to the scope's expansions to include health care and systems with down to 1 kW input power.	Staff appreciates the supportive comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239058&DocumentContentId=72494
239059.001	Coalition for Community Solar Access	For reference, CCSA filed comments in partnership with the Solar Energy Industries Association (SEIA) on March 9, 20211 , and then, independently, on May 5, 20212 , and again on June 21, 20213 , in response to the draft 2022 Building Energy Efficiency Standards. As with those prior comments, CCSA's focus here is on the Section 10-115 components of the 2022 California Energy Code, and specifically the ability for community shared solar electric generation systems (and/or battery storage systems) to play a role in supporting compliance that is otherwise required by Section 150.1(b)1 (and potentially other sections considered in the current proposal).	Thank you for your comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239058&DocumentContentId=72494
239059.002	Coalition for Community Solar Access	Section 10-115 – Community Shared Solar Electric Generation System or Community Shared Battery Storage System Compliance Option for On-Site Electric Generation or Battery Storage Requirements CCSA supports the proposed revisions in the 15-Day Express Terms and applauds Commission Staff for it's ongoing effort to balance stakeholder input while enabling the opportunity for community solar to serve as a viable compliance option in meeting California's energy policy goals. CCSA provides only one brief comment here for consideration. • Establishment of Community Solar Tariffs and Programs – CCSA echoes comments its provided in multiple filings associated with the building code that without a viable community solar tariff in investor-owned utility (IOU) territory community shared solar will not be able to support Title 24 compliance for the vast majority of new construction occurring in California. As it stands, CCSA has filed – at the California Public Utilities Commission - a proposal for the establishment of a community solar program in R.20-08-020 (hereafter the "net metering revisit" proceeding); as well as a Petition for Modification to provide rate stability in the Enhanced Community Renewables (ECR) program (part of the Green Tariff Shared Renewable program). Without a viable, scalable community solar program the building code updates provide a policy that has minimal opportunity to be leveraged in practice and which therefore undermines the ability to meet the	Thank you for the comment. Contrary to the comment, this is outside the scope of this rulemaking. There is ongoing coordination with the CPUC on potential of changing ECR program requirements to make compliant CS programs possible in IOUs; progress is largely dependent on solar industry making proposals for CPUC to revise rules to allow costs imposed on solar developers to make non-participants neutral to be based on the E3 avoided cost calculator	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239058&DocumentContentId=72495

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239061.001	Daikin U.S. Corporation	As mentioned in our comments letter to the 45-day language, Daikin supports the Commission's efforts to accelerate building electrification and decarbonization through the improvements made to Title 24, Part 6, to help the state meet its greenhouse gas (GHG) reduction goals. Daikin believes that heat pumps are the proven technology to achieve substantial GHG reduction in both residential and nonresidential buildings and appreciates that Section 150.1(c)6 sets prescriptive baselines to mandate the installations of either air-source heat pumps ("heat pumps" hereinafter) or heat pump water heaters (HPWHs) in each climate zone. However, while Daikin understands that the baselines were set based on cost-effectiveness tests, Daikin would like to reiterate that it is unclear about how the cost-effectiveness was calculated and how heat pumps and HPWHs were allocated to each climate zone as its baseline. In addition, the 15-day language further reduced the baseline allocation to heat pumps including the ones installed in Single Family Buildings in climate zone 10 as well as in Office, Financial Institution, and Library Building Spaces in climate zone 16. Therefore, the section likely undermines the performance of heat pumps in the given space heating applications, observing the zone allocations. Daikin is now more concerned given that the heat pump baseline is allocated to even fewer climate zones. Please see Section II for details.	The rationale for the heat pump baseline is laid out in the staff report "Residential Electric Baseline" TN 238850. The goal for this rulemaking is to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. ASHP and dual fuel HP can be used under the performance compliance method	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496
239061.002	Daikin U.S. Corporation	In addition, the CEC Title 24 15-day language continues to propose the modification to the economizer requirement by lowering the air handler cooling capacity threshold from 54,000 Btu/h to 33,000 Btu/h in Section 140.4(e) as proposed in the same section of the CEC Title 24 45- day language. As a result, air handlers of commercial HVAC systems with cooling capacity greater than 33,000 Btu/h will require an economizer installation. Exception 6 to Section 140.4(e)1 addresses air handlers with cooling capacity less than 54,000 Btu/h coupled with ventilation provided by a dedicated outdoor air system (DOAS) with exhaust air heat recovery in accordance with Section 140.4(p) as well as two subsections A and B to follow. This exception does not address air handlers with cooling capacity greater than 54,000 Btu/h. Several variable refrigerant flow (VRF) air handlers (hereinafter referenced as "indoor units") have cooling capacities greater than 54,000 Btu/h1 . Therefore, Daikin reiterates our concern about the new provision and submits our comments as below. Please see Section III for details.	Including an exception for 54kbtuh and up would weaken the standards when currently 54kbtuh and up require economizers and is out of scope of the proposal. Staff welcomes Daikin to provide a code change proposal that shows equivalent energy savings to include an exception for systems greater than 54kbtuh during the 2025 code cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496
239061.003	Daikin U.S. Corporation	Lastly, Daikin wants to emphasize that we support AHRI's comments made in Section D. Fan Power Budget – Sections 140.4(c), 170.2(c)(4)(a)(i) of the letter they posted to the docket.	Staff appreciates the comment. Please see the response to AHRI's comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496

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239061.004	Daikin U.S. Corporation	<p>Single Family Buildings</p> <p>As mentioned above, Daikin continues to emphasize that the baseline allocations to heat pumps undermine their heating performance. Moreover, the 15-day language further reduced the allocations in Section 150.1 (c)6 (new prescriptive requirements for heat pumps) by switching climate zone 10 baseline from heat pumps to HPWHs. In the 45-day language, climate zone 10 had a heat pump baseline along with climate zones 3, 4, 13, and 14. NRDC submitted a wholesale base cost comparison of a baseline code-compliant gas furnace/AC system and a heat pump system to the pre-rule making docket, and the comparison presents that the former is 14% more expensive than the latter. The gap increases to 29% in regions of the state where ultra-low NOx furnaces are required, including the South Coast and San Joaquin Valley air districts. In addition, the comparison states that installation cost "would typically be higher for gas appliances due to the installation of three, instead of two, pieces of equipment, as well as venting and installation of a second fuel type." This study alone suggests that heat pumps should be considered as baselines at least in all regions that do not require dual-fuel heat pumps or cold climate heat pumps; in other words, heat pumps should be qualified as baselines for climate zones 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, and 15.</p> <p>As stated in the 45-day language, Daikin believes a major barrier to heat pump adoption is the market's reliance on air</p>	<p>The rationale for the heat pump baseline is provided in the staff report "Residential Electric Baseline," found at TN 238850. Staff determined it was appropriate for this rulemaking to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. ASHP and dual fuel HP can be used under the performance compliance method.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496
239061.005	Daikin U.S. Corporation	<p>Multifamily Buildings</p> <p>The same notion outlined above applies to multifamily buildings. The prescriptive requirements for dwelling unit space conditioning systems for multifamily buildings are defined in Section 170.2(c)3A. Section 170.2(c)3Ai notes that the system should be a heat pump for climate zones 1 through 15 and a gas furnace/AC system for climate zone 16, where the building has three or fewer habitable stories. In addition, Section 170.2(c)3Aii notes that the system should be a heat pump for climate zones 2 through 15 and a dual-fuel heat pump for climate zones 1 and 16, where the building has four or more habitable stories. Daikin reiterates that the use of dual-fuel or cold climate heat pumps for climate zone 16 should be required in Section 170.2(c)3Ai and that the dual-fuel heat pump should remain as the baseline for climate zones 1 and 16 in such buildings. Daikin also recommends that the dual-fuel heat pump baseline can be substituted with the use of a cold-climate heat pump.</p>	<p>The analysis for lowrise multifamily is provided in the report "All-Electric Multifamily Compliance Pathway," found at TN 234888. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace. Cold-climate HP can be used under the performance method.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496

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239061.006	Daikin U.S. Corporation	<p>Nonresidential buildings</p> <p>The same notion also applies to nonresidential buildings. Section 140.4(a)2 defines the prescriptive requirements for space-conditioning systems in nonresidential buildings. In Section 140.4(a)2(B), gas furnace/AC systems are required in Retail and Grocery Building Spaces in climate zones 1 and 16. Daikin reiterates that dual-fuel heat pumps, instead of gas furnace/AC systems, should be the prescriptive baseline system for this section allowing the substitution of cold climate heat pumps. Also, in Section 140.4(a)2(F), while the 45-day language accepted dual-fuel heat pumps in addition to gas furnaces in Office, Financial Institution, and Library Building Spaces in climate zone 16 when the cooling capacity is less than 65,000 Btu/hr, the 15-day language no longer accepts dual-fuel heat pumps in the climate zone. Daikin suggests bringing back dual-fuel heat pumps as the baseline and to remove gas furnace/AC systems. Also, as mentioned in the other building type sections, Daikin requests that dual-fuel heat pump baselines are allowed to be substituted by cold-climate heat pumps.</p> <p>Dual-fuel heat pump systems are set as the prescriptive baseline system in Retail and Grocery Building Spaces in climate zones 1 and 16 (Section 140.4(a)2(C)) as well as in Office, Financial Institution, and Library Building Spaces in climate zone 16 (Section 140.4(a)2(G)) when the cooling capacity is greater than 65,000 Btu/hr. A dual-fuel system is also set as the baseline system in School Building Spaces in climate zones 1 and 16</p>	<p>The rationale for the heat pump baseline is provided in the report "Heat Pump Baseline for Non-residential and High-Rise Residential Buildings," found at TN 238849. Staff determined that it was appropriate for this rulemaking to set either HPWH or HP space heater as the Standard for a particular climate zone based on a number of factors, such as cost effectiveness, hourly source energy and TDV performance. In the cases where AC plus furnaces were specified, it was determined that dual fuel HP or HP was not cost effective and/or uses more energy than AC plus furnace. Cold-climate HP can be used under the performance method.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496
239061.007	Daikin U.S. Corporation	<p>Concluding this section, as the full market acceptance of heat pumps cannot be achieved overnight, Daikin suggests the state should be pursuing building electrification aggressively. Daikin believes mandating heat pumps in new buildings through Title 24 is an effective and significant first step to achieve the state's goals. A delay until the 2025 version of the building code will make meeting California's long term carbon neutrality goals more difficult.</p>	<p>Staff appreciates the comment of support. The CEC is committed to furthering state climate policies. The CEC has identified heat pumps as a key technology to achieve building decarbonization. However, staff identified several concerns that the market would not be ready to fully support electric-only construction in the 2022 Energy Code. Consistent with this analysis, the adopted regulations begin the transition to heat pump technology and take incremental steps towards an all-electric baseline to allow the market to adjust.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496
239061.008	Daikin U.S. Corporation	<p>III. Economizer Requirements</p> <p>California will hurt the adoption and use of highly efficient VRF systems in the state by not excepting VRF systems from the additional economizer requirements. Based upon comments during DOE negotiated rulemaking, VRF is a very energy-efficient technology and consistently outperforms conventional systems by 20-50%, from an energy efficiency perspective². Daikin suggests the lost energy savings of non-use of VRF would significantly outweigh the minimal energy savings of application of economizers in this small band of applications.</p>	<p>VRF systems are able to utilize the economizer trade off table, take the exception for decoupled DOAS using efficient fans, or they can be installed via the performance pathway.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496

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239061.009	Daikin U.S. Corporation	Installation of Economizers with VRF Systems Daikin reiterates that imposing an economizer requirement for VRF indoor units raises significant and severe installation barriers. Typically, VRF indoor units are categorized as either: (1) ducted indoor units; or (2) non-ducted (i.e., ductless) indoor units. Definitions for these categories can be found in AHRI Standard 12303. For ducted indoor units, the ductwork is often limited with little-to-no ducting for return or supply air within a single zone. For ductless indoor units, return air and supply air are passed through the indoor units without any ductwork. Figure 1 provides with a visual representation of the two indoor unit categories. Daikin reemphasizes that VRF ductless indoor units are physically unable to incorporate the use of economizers.	VRF systems are able to utilize the economizer trade off table, take the exception for decoupled DOAS using efficient fans, or they can be installed via the performance pathway.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2390618&DocumentContentId=72496
239061.010	Daikin U.S. Corporation	Furthermore, economizer installations with VRF ducted indoor units would lead to an increase in: (1) penetrations in the building roof and/or walls; (2) ductwork; and (3) system power input. These ducted indoor units are generally installed in their intended space conditioning zone, which may not be close to the building perimeter walls. Therefore, economizer installations with ducted indoor units present considerable complexities. Conventional packaged HVAC systems do not face the same complexities as the ventilation air is directly connected to these packaged systems with minimal impact to their installation. Figure 2 shows a side-by-side comparison using sample building layouts of: (1) VRF ducted indoor units with economizers; and (2) VRF ducted indoor units with direct method to bring in outside air. As observed from these layouts, the number of penetrations, ductwork, and complexities increase significantly with the installation of economizers. Based on these additional ductwork, penetrations, and complexities, the estimated differential in installation cost between the two sample layouts can go up to 5X4.	VRF systems are able to utilize the economizer trade off table, take the exception for decoupled DOAS using efficient fans, or they can be installed via the performance pathway.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2390618&DocumentContentId=72496
239061.011	Daikin U.S. Corporation	In addition to the installation difficulties, the efficiency and effectiveness of certain VRF systems may be impacted due to the use of economizers. VRF systems with heat recovery modules facilitate exchange of energy between different individual space conditioning zones to provide simultaneous cooling and heating, thereby increasing energy use effectiveness. The use of economizers compromises this energy recovery from individual zones, therefore preventing a system from delivering that same level of effectiveness and efficiency.	VRF systems are able to utilize the economizer trade off table, take the exception for decoupled DOAS using efficient fans, or they can be installed via the performance pathway. Staff welcomes Daikin to provide a code change proposal that provides data on heat recovery for an exemption.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2390618&DocumentContentId=72496
239061.012	Daikin U.S. Corporation	Therefore, Daikin continues to request that the CEC consider modifying Exception 6 to 140.4(e)1 to include all VRF indoor units, including units with cooling capacity > 54,000 Btu/h. Alternatively, we support the proposed approach outlined in the AHRI comments on 2022 Title 24 15-day language to limit economizer requirements to only outdoor systems (i.e., indoor units inside building spaces should be exempt from using economizers).	VRF systems are able to utilize the economizer trade off table, take the exception for decoupled DOAS using efficient fans, or they can be installed via the performance pathway.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2390618&DocumentContentId=72496

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239061.013	Daikin U.S. Corporation	Lastly, Daikin echoes the concern AHRI raised in its 15-day language comment about the newly proposed language in EXCEPTION 6 to Section 140.4(e)1 referencing to the requirements in Section 140.4(q)2 for bypass or control to disable energy recovery. Daikin supports AHRI's recommendation about the new language to incorporate "6.5.6.1.2.2 Provision for Air Economizer or Bypass" as well as "Exceptions to 6.5.6.1.2.2" in Addendum cd to ASHRAE 90.1-2016 into Section 140.4(q)(2).	Staff appreciates this comment and will review this for the 2025 energy code cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496
239061.014	Daikin U.S. Corporation	Bringing in Outside Air and the Use of Dedicated Outdoor Air Systems with VRF Systems Outside air can be brought into VRF space-conditioned zones via a direct method, integrated method, and decoupled DOAS method. These approaches have their own advantages and disadvantages, and the choice is generally application and space dependent. The 15-day language continues to allow for decoupled DOAS method with space-conditioning systems to be exempted from the economizer requirements. For regions (climate zones) and applications that do not need 100% dedicated outside air to be brought into the space-conditioning zone, we request the CEC to consider providing an option for use of other approaches to bring in outside air, such as the direct or integrated outside air method.	VRF systems are able to utilize the economizer trade off table, take the exception for decoupled DOAS using efficient fans, or they can be installed via the performance pathway.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239061&DocumentContentId=72496
239062.001	AHRI	Removal of Prescriptive Path and Performance Path for Certain Equipment Types – Sections 140.4(a)2, 150.1(c) 7 and 8, and 170.2(c) 3A and (d) AHRI notes that minor modifications were made to the 15-day language. For certain commercial spaces (Retail and Grocery) in climate zones 1 and 16 with cooling capacities less than 65,000 Btu/h, the proposed prescriptive compliance path for space conditioning is a furnace with an air conditioner rather than the previously proposed dual fuel heat pump. These modifications do not satisfy AHRI's concerns. We continue to oppose the proposed revisions to the Energy Code that remove certain types of equipment—primarily equipment that utilizes natural gas—from the prescriptive compliance path and pose impermissible barriers to installing this same equipment under the performance compliance path (Proposed Revisions). The Proposed Revisions concern the energy use of products covered by the Energy Policy and Conservation Act (EPCA), 42 U.S.C. § 6201 et seq., and are therefore preempted by federal law. AHRI commented extensively on the legal issues surrounding this section in response to the 45-day language. AHRI stands by those comments and incorporates them here by reference. 1 While we acknowledge that the Commission's intention in enacting the Proposed Revisions may align with state goals, we reiterate that if enacted as written the Proposed Revisions will be legally invalid.	Contrary to the comment, the adopted building standards do not mandate the use of any equipment or otherwise ban the installation or use of equipment that utilizes natural gas. The adopted building standards in the 2022 Energy Code do not require builders to install federally covered products that are more efficient than federal standards. Staff has determined that the standards thus meet the seven criteria enumerated in Section 6297(f)(3) and are therefore not preempted by 42 U.S.C. Section 6297.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.002	AHRI	The Proposed Revisions to the Energy Code prohibit the use of certain products under the prescriptive compliance path, which would have a significant impact on the market for those products, reducing consumer choice and potentially forcing consumers to use less effective or less energy efficient products. EPCA's preemption provisions exist to ensure that DOE can make decisions that balance the benefits and burdens of efficiency standards, rather than allowing states to make decisions that could have such unintended market consequences.	Contrary to the comment, the adopted building standards do not mandate the use of any equipment or otherwise ban the installation or use of equipment that utilizes natural gas. The adopted building standards in the 2022 Energy Code do not require builders to install federally covered products that are more efficient than federal standards. Staff has determined that the standards thus meet the seven criteria enumerated in Section 6297(f)(3) and are therefore not preempted by 42 U.S.C. Section 6297.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.003	AHRI	Separately, for Californians with limited financial resources, limiting products will increase prices and incentivize the continuous repair of less efficient equipment rather than the purchase of new energy-efficient models. Older existing equipment containing refrigerants will also likely continue to leak as patched equipment continues to be operated. Finally, limiting access to equipment types would increase costs for people given the relative cost of natural gas versus electricity in the California marketplace.	Prescriptive requirements only apply to buildings using the prescriptive path. A building using the performance path has additional flexibility in showing compliance. This applies specifically to newly constructed buildings and was found to be cost effective.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.004	AHRI	CEC acknowledges that the prescriptive package offers a simpler path than the performance approach. 2 This simpler design pathway should permit the use of all space heating and water heating options, as required by EPCA. Two recent studies, funded by U.S. Department of Energy (DOE), evaluated various questions regarding compliance with energy codes, including market preferences for the performance path compared to the prescriptive path.3 In a recent online survey conducted by the Florida Energy Systems Consortium (FESC) of 907 Energy Code Officials, almost half of questioned respondents estimated that 100 percent of projects use the prescriptive path.4 Twenty percent of questioned respondents estimated 60 to 80 percent of projects use the prescriptive path. 5 The second study, being conducted by Home Innovation Research Labs surveying builders is still underway, but both studies were presented as part of a single session at the Residential Energy Services Network (RESNET) Conference earlier this year. A video recording of the session is available through the RESNET website for registered users. One slide, below, presented data for the Pacific region supports that a large percentage of builders use the prescriptive path. Not only is it clear that the prescriptive pathway is preferred nationally, but it is also clear that the prescriptive method is being used in California. The FESC Energy Research Center survey authors sought to understand why the prescriptive pathway is preferred. The most common answer by the survey	Staff appreciates the detailed comment. Staff notes, as the commenter correctly acknowledges, that the adopted building standards do not mandate the use of any specific equipment, including heat pumps, or otherwise ban the installation or use of gas water heaters, furnaces, or boilers. Builders have the option to choose between the performance and prescriptive pathways, which allows for the installation of federally covered appliances and equipment. Staff finds that the adopted building standards in the 2022 Energy Code meet the seven criteria enumerated in Section 6297(f)(3) and are therefore not preempted by 42 U.S.C. Section 6297.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.005	AHRI	<p>Industry Burdens</p> <p>There are additional industry-wide burdens that CEC should be aware of as it promulgates the state energy code, including state-mandated refrigerant emissions limits, which coincides with a change in the safety standard for HVAC and water heating equipment.</p> <p>States are also pursuing regulations to reduce the high-global warming potential (GWP) hydrofluorocarbons (HFCs) in stationary air conditioning (AC) equipment to levels where some of the only viable options are mildly flammable. The California Air Resources Board (CARB) will present a regulation for adoption at the December board meeting. CARB is currently targeting a 750 GWP for all stationary AC, to be implemented on January 1, 2025. This regulation, and any other state GWP regulations, will require the development of a second product line for all products using refrigerants. Currently, there are only six low-GWP refrigerant options that have only recently been approved by the Environmental Protection Agency (EPA) in May 2021.</p> <p>New low-GWP refrigerants will have a significant impact on the HVAC industry. Since nearly all of these new low-GWP refrigerants have been designated lower flammability (A2L), all new safety standards address the application of these new A2L refrigerants and subsequent leak mitigation requirements.</p>	<p>Staff appreciates the detailed comment. Staff is aware of regulations that are promulgated by fellow state and federal agencies, including those addressed here. Although staff is sympathetic to those concerns raised by industry, the Warren-Alquist Act and California Building Standards Law require the Energy Commission to ensure that the state's Energy Code results in regulations that are cost-effective for consumers over the lifetime of the relevant products. Once these efforts result in final rules staff can incorporate harmonizing amendments into the Energy Code as a part of subsequent regular triennial or intervening Energy Code / Building Standards Code updates, consistent with the intent of the regular triennial update cycle. Additional information on economic impacts required by law can be found in the rulemaking record, including the NOPA, ISOR, FSOR, and Form 399.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.006	AHRI	<p>In addition, the existing safety standard, UL Standard 1995, will sunset on January 1, 2024, and a new safety standard, UL 60335-2-40, will be required for all cooling product distributed in the U.S. and Canada. All products currently listed to UL 1995 will need to be tested and certified to UL Standard 60335-2-40 if any modifications are made. In addition to meeting new codes and standards requirements, manufacturers must also redesign products, amend literature, update all regulatory certification requirements and educate their distributors and customers about the change by January 1, 2024.</p> <p>The industry is also preparing for new efficiency metrics and levels for residential central air conditioners and heat pumps; new efficiency levels for small, large, and very large commercial package air conditioners and heat pumps and air-cooled, water-cooled, evaporatively-cooled, and water source unitary air conditioners and heat pumps; on January 1, 2023, as well as new efficiency levels for variable refrigerant flow equipment, and computer room air conditioners in California. Many companies manufacture these regulated products, and the impending regulatory changes have absorbed available research and development resources and, even more importantly, laboratory testing time. These burdens highlight the immense pressure on industry merely to meet minimum regulatory compliance. Additional burdens, such as overly stringent requirements on components, tend to keep research and design budgets, staff, and laboratories focused on developing minimally</p>	<p>Staff appreciates the detailed comment. Staff is aware of regulations that are promulgated by fellow state and federal agencies, including those addressed here. Although staff is sympathetic to those concerns raised by industry, the Warren-Alquist Act and California Building Standards Law require the Energy Commission to ensure that the state's Energy Code results in regulations that are cost-effective for consumers over the lifetime of the relevant products. Staff notes that the Energy Code does not make direct reference to UL 1995; staff is not able to find that the Energy Code provisions have any effect on or interaction with this changeover and its associated testing costs. Additional information on economic impacts required by law can be found in the rulemaking record, including the NOPA, ISOR, FSOR, and Form 399.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.007	AHRI	<p>First, commercially available desiccant systems will be available prior to Title 24- 2022 coming into force. To more clearly permit desiccant dehumidification in HVAC systems, AHRI recommends modification to</p> <p>INTEGRATED HVAC SYSTEM: INTEGRATED HVAC SYSTEM is an HVAC system designed to handle both sensible and latent heat removal. Integrated HVAC systems may include, but are not limited to: HVAC systems with a sensible heat ratio of 0.65 or less and the capability of providing cooling, dedicated outdoor air systems, single package air conditioners with either at least one refrigerant circuit providing hot gas reheat or a desiccant dehumidification system, and stand-alone dehumidifiers modified to allow external heat rejection.</p>	<p>The list of example HVAC systems in the adopted building standards is not inclusive or exclusive. The addition of desiccant dehumidification system into the list is unnecessary. Additionally, as reliable data concerning desiccant systems becomes available, they can be evaluated for inclusion in future cycles based on cost effectiveness.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.008	AHRI	<p>Secondly, AHRI recommends a modification to the DX-DEDICATED OUTDOOR AIR SYSTEM UNITS definition to acknowledge that the product is not always supplied with a means to reheat dehumidified air and to be consistent with AHRI 920 (I-P/2020): Performance Rating of Direct Expansion-Dedicated Outdoor Air System Units (with Addendum 1).</p> <p>DX-DEDICATED OUTDOOR AIR SYSTEM UNITS (DX-DOAS)- a type of air-cooled, water-cooled, or water-source DOAS unit that dehumidifies 100 percent outdoor air and may include reheat capable of controlling the supply dry-bulb temperature of the dehumidified air to the designed supply air temperature.</p>	<p>The definition used in the adopted standards is aligned with the ASHRAE definition and staff finds this approach to be appropriate.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.009	AHRI	<p>B. Mandatory Filter Gasketing Requirements – Sections 120.1(c)(1)(D), 150.0(m)(12)(B)(v), and 160.2(b)(1)(B)(v)</p> <p>AHRI appreciates the modifications presented in the 15-day language for gasketing requirements in Section 120.1(c)(1)(D); however, there is still opportunity for improvement. The draft language still contains unintended compliance concerns, albeit lessened, for systems installed in Nonresidential and Hotel/Motel Buildings. This new section requires filter racks to be gasketed, sealed, or to use other means to prevent air from bypassing the MERV 13 filter. The revised language proposed will still present issues with compliance that AHRI's new suggested language seeks to correct. The use of "prevent" still does not recognize tolerancing in the reduction of air bypass. Rather the goal to ensuring that equipment operates as intended, is to minimize bypass around the filter. Specifying a reduction, rather than an elimination of air bypass will improve the condition without creating an impossible requirement. Therefore, AHRI recommends that this requirement be modified as follows, "Filter racks or grilles shall use gaskets, sealing, or other means to close gap around inserted filters in order to minimize prevent air from bypassing the filter."</p> <p>The above analysis and recommendation also apply to Sections 150.0(m)(12)(B)(v) and 160.2(b)(1)(B)(v), Air Filtration and System Design.</p>	<p>Staff appreciates the comment. Staff finds that using the term "minimize" would present the same issue of not having a target tolerance. The intention of the requirement is to prevent air from bypassing the filter, where the authority having jurisdiction can make that determination. Accordingly, no change was made in response to this comment.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.010	AHRI	<p>C. Mandatory Requirements for Fans – Section 120.10</p> <p>AHRI appreciates modifications to EXCEPTION 1 to Section 120.10(a) in 15-day language that clearly exclude equipment currently in the process of first-time federal regulation, for example, computer room air conditioners (CRAC) and dedicated outdoor air systems (DOAS). Both equipment types are categories of Commercial Air Conditioning and Heating Equipment found at 10 CFR § 431.97 and the modification appropriately excludes both from being subject to double regulation with FEI requirements.</p>	Staff appreciates the comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.011	AHRI	<p>AHRI reiterates, that while an exception to Section 120.10(a)(2), that FEI values for embedded fans do not need to be third party verified is appropriate, AHRI recommends instead clearly exempting embedded fans. Embedded fans cannot be accurately and comparably rated to stand-alone fans or to other embedded fans using AMCA 208. Section 4.4 of AMCA 208-18 and Annex D (informative) includes the entirety of calculation methods for embedded fans. It is not written in mandatory language and cannot be used reliably to rate embedded fans with an FEI. Neither consumers nor regulators are able to determine which products have inextricably embedded fans and which do not. AHRI strongly urges CEC to exclude all embedded fans – there is no consistent, clear, uniform, repeatable, and reliable method to determine the FEI of an embedded fan.</p> <p>To exempt embedded fans and remove the compliance confusion, AHRI recommends deleting 120.10(a)(1) and EXCEPTION 1 to Section 120.10(a), should read, “Embedded fans and fans intended for replacement of embedded fans are exempt” or “Keep in mind that the majority of embedded fan applications are exempted anyway as most equipment categories are covered by energy efficiency metrics”.</p>	Staff appreciates this comment, but has concluded that there is no justification for CA giving an exemption for all embedded fans when ASHRAE and IECC code do not.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.012	AHRI	<p>D. Fan Power Budget – Sections 140.4(c), 170.2(c)(4)(a)(i)</p> <p>AHRI appreciates the continued outreach from CEC staff and the CASE team on this complicated and impactful proposal. While AHRI supports the conceptual change to regulating fan system input KW instead of fan bhp, we have outstanding concerns with the 15-day regulatory text that have not been adequately addressed. Most importantly, based on a simplified analysis using motor power, the Fan Power Budget language, as proposed, remains overly stringent – much more so than the proposal introduced to ASHRAE 90.1, particularly for certain applications. The stringency varies considerably by unit size and without modification, this proposal stands to eliminate larger commercial packaged air conditioners and heat pumps (rooftop units or RTUs) from the California market.</p>	Staff appreciates the comment. For new construction, staff determined that the proposal was a design requirement that would unnecessarily eliminate products from the market. Staff worked extensively with the manufacturers and AHRI and, based on stakeholder feedback, adjusted the adopted language to provide credit via curb adaptors to revert the additions and alterations section credit back to 2019 values.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.013	AHRI	<p>This proposal impacts more than RTUs; however, large RTUs are space constrained products because of transportation limitations – they must fit on flat-bed trucks. By using the most stringent cases for static pressure allowances in the analysis there will be an increase in unit casing size by approximately 15-percent to accommodate larger fans (for typical job applications). If compliance requires larger fans and cabinets, units will be unable to meet transportation limitations. Similar issues may be present, albeit on a smaller scale, with rooftop air-handlers (RTAH). RTAHs can be split for shipping, whereas packaged RTUs cannot due to electrical wiring and refrigerant piping. We reiterated that there will be few, if any, compliant products over 20 tons available in California if the proposal is not further modified. AHRI recommends creating a category for very large units. Currently, Table 140.4-A: Supply Fan Power Allowances (watts/cfm) includes three capacity categories, with the largest being >10,000cfm. AHRI recommends a 10,00 to 20,000 cfm and the addition of a >20,000 cfm category for both multi-zone VAV and all other fan systems. In the >20,000 cfm category, where there is concern regarding product availability, the external static pressures should be higher to account for longer ductwork associated with larger units. Other modifications can be made to acknowledge the differences in the application and function of the larger units.</p>	<p>As staff mentioned previously, the fan power budget proposal is intended to target designers to design better ducts, thus reducing static pressures and not removing products from the market.</p> <p>Staff finds that adopting the alternate static pressure requirement for >20,000 proposed by the commenter could potentially represent a material lessening of stringency and increase in energy use in some cases; the rulemaking record does not contain any information on the potential benefits and/or costs associated with doing so. Staff therefore finds that consideration of alternate and potentially less stringent fan power budget requirements would not be appropriate within this rulemaking. That said, staff is committed to working with the stakeholder regarding modeling of duct run length impacts on energy use and performance, and using that information to determine appropriate routes for performance-based compliance.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.014	AHRI	<p>As detailed above, manufacturers are facing significant regulatory burdens and RTU manufacturers are already well into the redesign process to bring products into compliance with DOE's January 1, 2023 efficiency standards.9 To bring a product line to market to address new regulatory requirements, not only must the product be redesigned, but it must also be retested, have its components recertified, and the entire product must be recertified to safety and efficiency standards. 10 To expand, first manufacturers must design the new cabinet and fan, then test fan performance. Next, additional performance and safety tests can largely be conducted in parallel. These include performance testing DX systems and furnaces to comply with federal efficiency standards and safety testing the product. Furnace and electric heat testing take approximately one year to conduct. Next, and only after performance and safety tests are substantially complete, acoustical, wind and seismic tests must be conducted, which takes approximately one year. To further complicate the design cycle for these products, manufacturers are also planning for the introduction of entirely new products, also complying with DOE 2023 efficiency standards, while using A2L refrigerants to comply with California Air Resource Board regulations. In all, the process to comply with the fan power budget requirement will take five years.</p>	<p>The proposal is not a requirement on manufacturers, but on building designers to improve duct design and lower the static pressure. Therefore, no change was made in response to this comment.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.015	AHRI	While the CASE team responsible for developing this proposal made many presentations on this new approach, critical inputs necessary to analyze the impact of the different approach were not communicated. For example, stakeholders could not obtain the static pressure allowance used in the analysis. Without this information, many additional hours of stakeholder review of the proposal were required. Stakeholders have also questioned certain assumptions for being overly stringent. For example, the fan requirement was set for a 15-percent higher FEI than new minimum requirements for stand-alone fans. This situation was present for nearly every component within the units, leading to an overly stringent proposal with compliance nearly impossible at actual job static pressures for larger tonnage units. To improve this proposal, AHRI recommends adding a benefit for two-stage fans and reducing stringency of other provisions. The preferred approach would be to harmonize with fan efficiency proposals within Title 24 by implementing an FEI of either 1.0 or 0.95 (depending on the system). No supporting information has been presented in the CASE report to justify the increase in fan efficiency beyond those levels. Consultants have cited a review and analysis, but neither study details, nor outcomes, have been shared with stakeholders. Manufacturers have been unable to replicate such a study. The 90.1 proposal is for an increase of 1.06. If CEC insists on moving forward with this approach, the agency should use the same increase. If CEC intends to adopt the proposal without modification, AHRI maintains that compliance should begin no earlier than January 1, 2028.	The static pressures to develop the power allowances were published in the CASE report. The 15% refers to the fan efficacy which was used to determine how stringent the proposal should be. It was shown that duct design alone would be able to meet this the CASE report's proposal with a FEI of 1. Therefore, no change was made in response to this comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.016	AHRI	We recognize that products are not compliant or non-compliant in and of themselves; however, if they cannot comply at the customers' required external static pressure requirements, then the products essentially are non-compliant. AHRI members have submitted data directly to CEC outlining the proposal's impact on products. The 15- day language does not address the manufacturer concerns.	Staff appreciates the data provided by AHRI showing new construction static pressure requirements from customers. The CASE report's proposal's intent is to make customers request lower static pressures by better duct design.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.017	AHRI	As a follow up to a meeting with the CASE team, AHRI requested the Case Team to confirm that the calculation is reflective of Title 24-2019. The CASE team confirmed that the analysis does not include 0.5 in static allowance for return ducts and 0.5 in static for exhaust return control, which AHRI assumed to be an economizer. The CASE team cited the Title 24-2019 compliance manual's explanation of the credit and disagreed that the exhaust return control was an economizer.11 To summarize, the User's Manual explains that credit may be taken when some spaces are served by an air handler have exhaust airflow devices and other spaces do not and the exhaust airflow control device is typically modulated to maintain a negative or positive space pressure relative to the surrounding space. This describes an economizer. AHRI noted in comments to the CASE team that by not including the static allowances, they may have underestimated the impact of the proposal. AHRI contends these static allowances are appropriate and notes that the ASHRAE 90.1 User's Manual explains that the allowance for the return is based on an open plenum.	Contrary to the comment, the compliance manual clearly provides examples of negative or positive space pressure for certain spaces such as laboratories, test rooms, or operation rooms. Based on staff's analysis, staff concluded that the CASE report's analysis was appropriate, and therefore no change was made in response to this comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.018	AHRI	AHRI appreciates revisions to address issues raised with larger fans and cabinets on replacement applications with the addition of a conversion curb credit to Table 141; however, the credit was only applied to VAV systems. No information has been provided that supports excluding constant volume (CV) systems. Those CV systems would also require a curb adapter in many replacement projects. AHRI reiterates that if replacement rooftops require a completely new support structure, rather than a curb adapter, then the cost to building owners will be significant. This cost has not been accounted for in the CASE report. ¹² AHRI recommends extending the curb adapter pressure allowance to all other fan systems in replacement applications to allow for the continued use of cost effective conversion curbs and to account for existing ductwork.	Staff appreciates this comment. Staff has discussed with AHRI and stakeholders that the curb adapter credit is built into the baseline for CV systems and is already at the 2019 code cycle allowance. In order to avoid any potential confusion, staff will look to clarify this in the compliance manual and potential changes for 2025.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.019	AHRI	These comments also apply to the proposal included in Section 170.2, which addresses high-rise residential buildings. While AHRI is not opposed to the introduction of new sections to address multifamily buildings if this change helps designers, builders, and code officials, we are concerned with the possibility for diverging requirements in future editions of Title 24. If any of AHRI's proposed revisions to Section 140.4(c) are not made to Section 170.2, AHRI requests that CEC maintain and make public a table to track conflict/divergence between sections of similar requirements.	Staff notes that this comment relates to possible future Title 24 changes more so than to the changes proposed in this rulemaking. Nonetheless, staff are committed to transparency including in cases where requirements differ between nonresidential and multifamily buildings.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.020	AHRI	E. Prescriptive Requirements for Space Conditioning Systems – Section 140.4(e) Section 140.4(e) proposes the reduction of the economizer threshold to apply to equipment from 54,000 Btu/h to 33,000 Btu/h. While the requirement appears to offer energy savings, we question how cost effective it would be in practice. AHRI's concerns persist regarding (1) cost effectiveness with the proposed decoupled DOAS when paired with terminal equipment such as variable refrigerant flow (VRF), water source heat pumps, and small chilled-water coils; and (2) the limitation of implementation options with certain types of equipment, mainly VRF. The required inclusion of a DOAS or higher airflow capability in an energy recovery ventilator in conjunction with the terminal heating and cooling equipment stands to increase the cost of the system. VRF systems with heat recovery modules are also able to facilitate exchange of energy between different individual space conditioning zones to provide simultaneous cooling and heating, thereby increasing energy use effectiveness for this product. The use of economizers compromises this energy recovery from individual zones, and therefore is unable to deliver that same level of effectiveness and efficiency. The 15-day language continues to disallow for an integrated outside air approach to be used with space-conditioning systems. For regions (climate zones) and applications that do not need 100-percent dedicated outside air to be brought into the space-conditioning zone, it would make sense for CEC to consider	Based on staff's analysis, staff concluded that the analysis provided by the CASE team shows economizers to be cost effective by the primary pathway. VRF equipment are able to use the economizer trade off table or the performance pathway, or exception for equipment less than 54kbtuh. Integrated outside air VRF are able to use the economizer trade off table, performance pathway, or exception with high efficient fans. Therefore, no change was made in response to this comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.021	AHRI	<p>Economizers were designed to be implemented on outdoor equipment, whereas challenges exist in indoor implementation. AHRI would not oppose limiting the requirement to extend economizer requirement down to 33,000 Btu/h if it was only applied to outside units.</p> <p>AHRI reiterates it requests to CEC to remove the proposal to require economizers on indoor fan coils and to limit the expansion of economizer requirements to outdoor products.</p>	<p>VRF systems and other alternatives with greater efficiency have the option of demonstrating compliance via the economizer trade off table or the performance approach, and thus the comment's proposal is unnecessary. Therefore, no change was made in response to this comment.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.022	AHRI	<p>Additionally, AHRI notes that language newly proposed in 15-day Express Terms in Section 140.4(e), references requirements in Section 140.4(q)(2) for bypass or control to disable energy recovery. Section 140.4(q)(2) does not address the pressure drop of the wheel and also could be improved with more specific control language. As currently written, requirements in Section 140.4(q)(2) could be met by simply shutting off the energy recovery wheel. Addendum cd to ASHRAE 90.1-2016 (approved, but not yet published) serves primarily to clarify the original intention for bypass and control to permit economizer operation.¹³ The bypass working group of ASHRAE 90.1 evaluated several systems and found that a clearer control strategy is required where energy recovery systems are installed. Controls are already required by the standard; however, in some cases, compliance with the existing standard may result in less than optimum economizer operation and increased fan energy use. Pressure drop requirements are also included for bypass on the return and exhaust in ASHRAE 90.1. AHRI recommends including provisions from the following language into Section 140.4(q)(2):</p> <p>6.5.6.1.2.2 Provision for Air Economizer or Bypass Operation Provision shall be made for both outdoor air and exhaust air to bypass or control the energy recovery system to enable economizer operation as required by Section 6.5.1.1. The bypass or control shall meet the following criteria:</p> <p>a. For energy recovery systems where the transfer of energy</p>	<p>Staff appreciates the comment and notes that it is outside the scope of this rulemaking at the 15-day language stage. Staff would welcome a proposal for consideration in the 2025 Energy Code update cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.023	AHRI	<p>F. Data Center Requirements – Sections 140.9 and 141.1</p> <p>AHRI is concerned that proposed, late-stage changes to data center requirements are both unachievable and a breach of the California Administrative Procedure Act (APA).¹⁴ The data center proposal as written in the 45-day comments – prescriptively including refrigerant economizers – was correctly implemented, technology neutral, and good for California consumers. In the 45-day comments, CEC rightly recognized inherent differences between air and water/refrigerant economizers and AHRI agreed with the agency's decision to establish different temperature thresholds for these technologies.</p>	<p>Staff has worked with the CASE team and Vertiv and, based on feedback from stakeholders, have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information in the record. Staff will continue working with the CASE team, Vertiv, and other stakeholders to develop the record for the 2025 cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.024	AHRI	In Sections 140.9 (and 141.1) of the 15-day language, however, CEC has introduced the problematic and unforeseeable requirements of Minimum NSenCOP values imposed on the Pumped Refrigerant Economizer by Climate Zone. The Net Sensible Coefficient of Performance (NSenCOP) is defined within AHRI Standard 1360- 2017 as "A ratio of the Net Sensible Cooling Capacity in kilowatts to the total power input in kilowatts (excluding reheaters and humidifiers) at any given set of Rating Conditions." The inserted tables have no indication of what the input metrics are for a refrigerant economizer manufacturer to calculate their equipment's corresponding NSenCOP value for compliance. Furthermore, there is a difference in the NSenCOP values in the tables provided in sections 140.9 and 141.1 with the only noted difference written into the draft language as being the economizer temperature threshold which has no bearing on how the NSenCOP metric is calculated. As noted within the definition, the NSenCOP is calculated at any given set of Rating Conditions, but the Rating Conditions in the standard's input tables 2 through 4 do not have an input value for the economizer temperature. There is no justification for different tables of values since the economizer temperature is not part of the NSenCOP calculation.	Staff has worked with the CASE team and Vertiv and, based on feedback from stakeholders, have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information in the record. Staff will continue working with the CASE team, Vertiv, and other stakeholders to develop the record for the 2025 cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.025	AHRI	The proposed efficiency tables by climate zone are a misapplication of AHRI 1360 and should be deleted. Section 110.2 was updated to include mandatory equipment efficiencies, consistent with ASHRAE 90.1-2019, based off of the AHRI Standard 1360 test method. In ASHRAE 90.1-2019, existing equipment efficiencies were increased, and many new product equipment types were added. Major faults with the NSenCOP values contained in the Prescriptive tables in sections 140.9 and 141.1 compared to the Mandatory minimum efficiency requirements of Section 110.2 are that some climate zones fall below the Mandatory requirements, the Climate Zone metrics are not differentiating between the varying efficiency requirements broken down by Net Sensible Cooling Capacity (NSCC) as seen with the Mandatory requirements, and the inputs to generate the compliance performance is not defined. Including an unvetted efficiency requirement, based off an annualized energy model, by climate zone, on top of new performance requirements based on standard rating conditions is excessive regulation.	Staff has worked with the CASE team and Vertiv and, based on feedback from stakeholders, have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information in the record. Staff will continue working with the CASE team, Vertiv, and other stakeholders to develop the record for the 2025 cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.026	AHRI	Data centers are essential to public and private business operations and are considered to be mission critical. The introduction of these new requirements in 15-day language for these products was not reasonably foreseeable based on the NOPA and constitutes a substantial change, which requires the publication of another 45-day notice in the Notice Register or a reversion to the 45-day language for the August Commission vote.	Staff has worked with the CASE team and Vertiv and, based on feedback from stakeholders, have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information in the record. Staff will continue working with the CASE team, Vertiv, and other stakeholders to develop the record for the 2025 cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.027	AHRI	It is noted that the inserted language for all economizer types now requiring "partial cooling even when additional mechanical cooling is required and capable of providing..." is identical language seen for air and water economizers from the Prescriptive Requirements for Space Conditioning Systems in section 140.4 intended only to further clarify what an "integrated" economizer is.	Staff appreciates the comment. Staff notes that the comment correctly characterizes the language.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.028	AHRI	G. Insulation for Piping and Tanks – Section 150.0(j)(1) and Section 160.4(f) AHRI appreciates CEC's modifications to Sections 150.0(j)(1) and 160.4(f), which address concerns raised regarding the lack of justification for increasing the insulation to R-16 in the CASE report. As we noted, this change will yield only a small benefit, when calculated using time dependent valuation (TDV), perhaps not enough to cost justify the burden of the installation. As such, we also recommending striking the requirement in Section 110.3(c)(3)(B). We also note that in Sections 110.3(c)(3) and 110.8(d)(2) unfired hot water storage tanks (UFWST) are called unfired service water heater storage tanks. This is not correct and should be fixed prior to adoption. Finally, the federal standard is R-12.5, and CEC's proposed additional requirements are more stringent than the federal standard and subject to preemption.	The 2022 proposed edits updated the external insulation blanket R-value to account for the current DOE standard for internal tank insulation, resulting in a reduction in the historical requirement if only insulation blankets are used to comply. We have thoroughly assessed the legality of the 2022 Energy Code, and have concluded our standards are not preempted.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.029	AHRI	H. Ventilation and IAQ – Section 150.0(o)(1)(K), Section 150.0(o)(3), Section 120.1(b)(2)(C), and Section 160.2(b)(2)(A)(x)(b) AHRI appreciates CEC's reconsideration of implementing measures that would ban the use of federally compliant appliances in buildings. Modifications proposed in 15- day language in Section 150.0(o)(1)(K) resolve AHRI's concern and we are pleased California homeowners in smaller homes will continue to be able to install the most common type of residential gas water heaters, an atmospherically vented furnace or water heater, a pellet stove, or even a wood-burning fireplace. AHRI reiterates our suggestion that it would be easier for stakeholders to review code changes and for builders to comply with indoor air quality requirements if relevant sections from ASHRAE 62.2 were included in Title 24, rather than readers being required to purchase the ASHRAE standard. It is not possible to assess the code proposal, "all dwelling units shall meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to amendments specified in Section 150.0(o)" without purchasing ASHRAE 62.2. Likewise, a builder would be unable to comply with mandatory requirements in Title 24 without having purchased this standard.	Staff appreciates the comment. The Energy Standards adopts sections of ASHRAE 62.2 by reference with some of the language incorporated explicitly, usually with amendments. Consistent with prior practice, CEC copied and pasted applicable sections of ASHRAE 62.2 into the residential compliance manual for public use (free) in the adopted standards.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.030	AHRI	I. Prohibition of Electric Resistance Heating for Single and Multifamily Residential Buildings, Additions and Alterations – Sections 150.2(b)(1)(G) and 180.2(b)(2)(A)(v) AHRI appreciates CEC revisiting the language proposed in EXCEPTION 1 to Section 150.2(b)(1)(G) (and 180.2(b)(2)(A)(v) in the new multifamily section). Language proposed in 15-day Express Terms make clear that electric resistance heating in heat pumps is excluded, avoiding the least-cost elimination of heat.	Staff appreciates the comment of support.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.031	AHRI	J. Expected 15-day language clarification for Multifamily Buildings – Additions – Section 180.1 – Exceptions AHRI appreciates the addition of EXCEPTION 7 to Section 180.1, consistent with CEC's May 27th presentation, which clarifies, "that new systems serving additions can be a heat pump or gas heating system." 15 AHRI continues to encourage CEC to also include an option to allow gas water heaters through the prescriptive approach for new systems serving additions. Per Section 170.2(d), the only options are 240-volt heat pump water heaters (HPWH) and instantaneous water heaters. There are cases where the gas line would need to double in size to accommodate a new instantaneous gas water heater and a 240-volt HPWH may require an electrical upgrade. In these cases, a gas water heater would be the most cost-effective solution. AHRI questions if these costs were considered in the cost justification for the proposal. If this measure has not been cost justified for additions, gas water heaters must continue to be permitted to be installed.	Staff notes that, contrary to the comment, the adopted building standards do not mandate the use of any specific equipment, including heat pumps, or otherwise ban the installation or use of gas water heaters, furnaces, or boilers. Builders have the option to choose between the performance and prescriptive pathways, which allows for the installation of federally covered appliances and equipment. This requirement has not changed from the 2019 Energy Code and was reproduced for the multifamily section of the 2022 Energy Code.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.032	AHRI	ANSI/CTA-2045-B proposed requirements conflict with Section 110.12(a), which provides more flexibility to manufacturers to meet the standard.	The requirements for JA13 are voluntary and only required if compliance credit is taken. Mandatory measures for water heater scenarios in additions and alterations provide an option of meeting 110.12(a) or have a ANSI/CTA-2045-B communication port.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.033	AHRI	Subchapter 11 Multifamily Buildings, Section 170.2(d), includes prescriptive installation requirements for central HPWHs rather than providing flexibility for the manufacturer to optimize system performance. These requirements also fail to consider that this technology is nascent and there are new requirements for installation, service, and maintenance due to it being a more complex system and creating a need for more qualified distributors and contractors.	The CHPWH requirements in 170.2 are necessary because these are built-up systems, and the performance of these systems are highly dependent on proper design. In addition, performance compliance is always available for system configuration different from the prescriptive requirement and therefore flexibility is provided.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.034	AHRI	Section JA13 indicates a misunderstanding of the standards that are referenced when considering the requirements in this appendix. Specifically, standards UL 60730-1, ASSE 1082, and ASSE1084 are mentioned. The first pertains to electrical controls but does not limit outlet water temperature like a thermostatic mixing valve. ASSE 1082 and 1084 only control water temperature to specific limits (i.e., within a certain tolerance under certain conditions), but they do not necessarily limit the water to a safe temperature.	JA13 is identical to the compliance option approved in 2019. The document was developed with industry consensus over an 18-month development period, and staff has determined that the record supports the adopted language. Additionally, other water heater manufacturers have indicated there is no issue with the current language, contrary to this comment, and staff expects OEMs to produce HPWHs that are safe for consumer use.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239062.035	AHRI	Similar to the comments above about 170.2(d), the requirements for central HPWH systems at Section JA14 are overly prescriptive and raise federal preemption concerns. They require a significant amount of additional testing that is not harmonized with the federally prescribed test procedure. In addition, the defined test procedure does not align with the federal testing with multiple new combinations and conditions.	JA14 is a voluntary reporting of performance data for compliance credit, and thus it is not required to meet either the prescriptive or performance requirements for CHPWH. Because it is a voluntary measure, it is not subject to federal preemption.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.036	AHRI	A. CEC should remove barriers to the installation of space heat pumps AHRI is disappointed that CEC has not considered recommendations that CEC staff evaluate certain provisions within Title 24 to further increase the adoption of space heat pumps. Residential Appendix Rated Heat Pump Capacity Verification, RA 3.4.4.3(i), imposes requirements for verification of system performance based on 350 cfm per nominal ton (300 cfm/ton of nominal cooling capacity for altered systems); however, AHRI has consistently and continues to advocate for these requirements to be based on rated capacity. The 350 cfm	Based on staff's analysis, staff determined that a 350cfm per ton minimum standard is broadly applicable and appropriate as a minimum standard, noting that there is already an adopted 250cfm minimum applicable to the category of small duct high velocity equipment. Staff determined that a capacity standard does not serve the same function as an airflow rate standard: the standard is intentional in specifying the level of airflow for the system to be designed to, rather than allowing designed capacity to dictate airflow. To the extent that there are classes of equipment that may be challenged in achieving the requisite minimum airflow due to technical challenges, staff invites the commenter to submit a complete code change proposal. Staff appreciates the comment. Staff will continue to evaluate software evaluation through this ongoing process.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.037	AHRI	AHRI also continues to urge CEC to address the artificially low performance required when modeling variable capacity heat pumps (VCHP) in the Alternative Calculation Method (ACM) Reference Manual and the residential California Building Energy Code Compliance (CBECC-Res) performance compliance software used for demonstrating compliance with the	Staff appreciates the comment. Staff will continue to evaluate software evaluation through this ongoing process.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.038	AHRI	Lastly, in response to CEC's December 14, 2020 Flexible Demand Appliance Standards stakeholder workshop,16 AHRI noted that harmonization with industry standards, such as AHRI Standard 1380 (I-P/2019): Demand Response through Variable Capacity HVAC Systems in Residential and Small Commercial Applications (AHRI 1380), will allow manufacturers to produce heat pumps for a broader market. Again, AHRI urges CEC's efforts to be geared towards incentivizing the adoption of DR-products (e.g., performance compliance credits) rather than limiting product availability for consumers.	Staff appreciates the comment and invites further comment in the Flexible Demand Appliance Standards proceedings. The Energy Commission may look into additional DR credits as products become available. These credits would need to go through the appropriate evaluation processes before being included.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.039	AHRI	B. Refrigeration Systems Opportunities AHRI appreciates CEC's update of TABLE 110.2-G PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT to completely harmonize with ASHRAE 90.1-2019, as follows: This addition, along with the addition of footnote "c" from ASHRAE 90.1, completely harmonizes Title 24 with ASHRAE 90.1-2019 Table 6.8.1-7 Performance Requirements for Heat Rejection Equipment—Minimum Efficiency Requirements, adding requirements for dry cooler minimum efficiency and test procedures.	Staff appreciates the comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498
239062.040	AHRI	AHRI notes there may be an editorial mistake in the 15-day language – Table 110- 2-G appears to have been relabeled as Table 110.2-E; however, the preceding table, with packaged terminal air conditioners (PTAC) and packaged terminal heat pumps (PTHP) minimum efficiency requirements, remains Table 110.2-E, as it is today. Lastly, AHRI recommends adding single package vertical units to the title of the PTAC and PTHP efficiency table, as they are two distinct products.	Thank you for this comment. Staff has reviewed the Tables and concluded that they are labeled correctly.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239062&DocumentContentId=72498

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239064.001	Sacramento Municipal Utility District	<p>SMUD Supports Strong Building Decarbonization Standards</p> <p>SMUD appreciates the CEC's leadership in prioritizing decarbonization in the 2022 Energy Code. We encourage the swift implementation of known strategies that reduce greenhouse gas (GHG) emissions from fossil fuels and refrigerants to combat the climate change crisis. Electrification of most energy end uses is critical for California to achieve its landmark 2030 and 2045 carbon reduction goals. Moving to an all-electric baseline will provide greater access for equity communities to clean energy and energy efficiency to reduce overall utility costs. Building electrification combined with clean electricity is a key component to meeting the state's emissions and air pollution goals. Building electrification also has a lower first cost than gas construction and is cost effective for consumers.1 SMUD joins the dozens of fellow stakeholders who have advocated throughout this rulemaking for strong building decarbonization standards, including an all-electric baseline.</p>	<p>Thank you for the support; amendments in this code cycle have largely stemmed from issues addressed and resolved by the CEC in consideration of SMUD's application, major public comment on areas of SMUD's application needing improvement, and SMUD's changes to that application to respond to that public comment.</p>	7/28/2021	15-Day	<p>https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=72900</p>
239064.002	Sacramento Municipal Utility District	<p>1. Section 10-115(a)(4)(C) Compliance Documentation</p> <p>The proposed revisions to this section would require community solar administrators to maintain records of "compliance documentation" that identifies the "requirements for the on-site solar electric generation system and/or battery storage system to comply with the standards in effect at the time the builder applied for the original building permit, and which establishes participants' obligations to meet the Opt-Out Requirements." It also requires administrators to provide this documentation to building owners upon request, and upon notification of title transfer, and to any building owner who requests to opt-out.</p> <p>SMUD recommends revising this section to better reflect realities of program administration and to allow for more flexibility in program design.</p> <p>First, instead of requiring administrators to house records of "compliance documentation," SMUD recommends requiring administrators to maintain information relating to compliance—specifically, system sizing information. This is the information customers will need if they decide to opt-out. By requiring administrators to record and retain information rather than documentation, administrators need not build information systems to scan and house legacy records. This is a more efficient and cost-effective way of achieving the same end.</p>	<p>Opt-out is allowed if a participating building installs an onsite PV system that would have been required if builder had not chosen to comply through community solar. The PV system needed to do so is unique to each building, considering size, orientation and shading. Administrator will be aware of these requirements because the share of the community solar system must be determined to be equivalent to that onsite PV system. Compliance documentation is readily available to the administrator at the time the building begins participation and provides a simple record of the needed PV system for the building. Staff determined that keeping these records of compliance documentation is necessary and reasonable to facilitate and document the community solar program. Staff will continue working with SMUD through implementation.</p>	7/28/2021	15-Day	<p>https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=72900</p>

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239064.003	Sacramento Municipal Utility District	Second, SMUD recommends simplifying the notice requirements and requiring provision of information to customers only upon request. This revision would better reflect the realities of program administration—community solar administrators will not necessarily know when title transfers. For example, many SMUD customers are tenants. In those cases, title to a property may change, but the tenant-customer will remain the same. If SMUD were to provide opt-out information to the tenant-customer, it could confuse that customer, who would not have the right to opt-out. Moreover, information regarding a building owner's right to opt-out will be provided at the time of title transfer, pursuant to section 10-115(a)(4)(B)(i), and thus this additional requirement is duplicative. SMUD recommends that the regulation leave customer service issues such as this to the expertise and discretion of the community solar administrator.	Participating buildings are required to continue to participate for 20 years unless a building owner elects to exercise the opt-out option, which is contingent upon installation of the PV system equivalent to the Community Solar share; buildings may be sold and resold throughout this 20 year period. It is critically important for new owners to be made aware of their opt-out rights and responsibilities, and administrator should be proactive to ensure this information is freely provided and there are no surprises. The adopted language specifies 3 circumstances where the administrator shall provide this information: upon a participating builder's request; when SMUD is notified that that title has changed ; or when customer indicates interest in opt-out. Staff determined these requirements are necessary and reasonable to facilitate the community solar program while protecting building owners.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=7290
239064.004	Sacramento Municipal Utility District	In consideration of the above, SMUD suggests striking the proposed revisions to Section 10-115(a)(4)(C) and replacing that Section with the following text: C. Documentation of System Size. The Administrator shall record and maintain information relating to the size of the on-site solar electric generation system the building owner would have been required to install in order to comply with the standards in effect at the time of enrollment in the community solar program. The Administrator shall provide such information to the participating building owner upon request.	Staff disagree with this proposed change. Record retention is necessary for the purpose of auditing Administrator performance in the event of a dispute. Retaining these records protects both the Administrator and homeowners. Administrators will need to keep files on each participating building to accomplish that. The documents related to opt-out would be a small portion of such records and would be the last documents to a file that otherwise would continue to grow through the rest of the 20 year period.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=7290
239064.005	Sacramento Municipal Utility District	2. Section 10-115(4)(B) and 10-115(a)(4)(D): Building Owner Opt-Out a. SMUD does not oppose an opt-out provision but is concerned it will discourage new entrants. As SMUD has previously noted, we support staff's stated intent to "enhance the viability of community-scale projects as an alternative to on-site installation of renewable energy and energy storage systems."6 In furtherance of that goal, we join others7 in recommending that staff consider the potential implications of imposing an opt-out requirement on program administrators. Planning for and developing new community solar facilities and programs requires a significant investment of time, resources, and money. Contracts with program participants encourage and protect those investments. A large utility may have the ability to balance and repurpose utility scale resources without significant risk of stranding new community solar assets. However, allowing a customer to cancel a contract or to "opt out" at their convenience could discourage new solar developers and administrators—especially smaller, non-utility administrators—from entering the market.	Ensuring customer choice by allowing opt-out was one of the most strongly pursued improvements to SMUD's application based on public comment. Staff determined that allowing an opt-out option, as well as strong communication about customer rights and responsibilities, is a reasonable obligation for administrators to conduct, and it is an inherent part of good customer relations.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=7290

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239064.006	Sacramento Municipal Utility District	<p>b. Participant opt-out should be conditioned on compliance with the current Energy Code, rather than obsolete, vintage versions of the Code.</p> <p>As written, the proposed revisions in 10-115(a)(4)(B) would require, prior to opt-out, that a participant install an onsite solar generation system that complies with an obsolete version of the Energy Code. For example, a participant who joins SMUD's program next year, but ultimately decides to opt out in 2040, would have to install a system that satisfies Code requirements from 2022—requirements that will then have been out of date for nearly two decades. This is problematic from both a policy and an operational perspective. As a matter of policy, current codes reflect, among other things, current environmental concerns, markets and technology, policy priorities, and economics, which, when taken together, help inform the thoughtful triennial revisions to the Energy Code. Requiring compliance with an outdated code simply fails to serve any current or future state policy goals.</p> <p>From an operational perspective, requiring compliance with vintage codes creates significant hurdles for building owners and administrators and could generate confusion among customers, on-site solar installers, and building officials. From an administrator's perspective, it complicates the opt-out process and requires otherwise unnecessary document and information management practices.⁸ From a customer's perspective, they</p>	<p>Staff appreciates the comment. However, the obligation to install onsite solar as part of exercising the opt out option has nothing to do with what a future building code may or may not require. Rather, the PV system that is needed must be equivalent to the share of the Community Solar system for that building. The obligation to install on-site solar to opt out therefore is a condition of participation in the program from the outset and should be communicated by the administrator as such. It is the administrator's responsibility to enforce their contractual agreement with the customer that the equivalent onsite PV system gets installed; there is no obligation for the building department to enforce that participation commitment nor is it reasonable to create a regulation that would impose that additional burden on the building department. At the point of installation of a retrofit PV system, the building department is strictly performing a check of the electrical safety that has nothing to do with a condition of participation commitment to install an onsite PV system equivalent to the share of the community solar system, which is privately administered consistent with CEC administrative regulations. It should be noted that the CEC worked closely with SMUD to make the administrator's burden to check the onsite system at opt-out as simple as possible to conduct.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239064&DocumentContentId=72900
239064.007	Sacramento Municipal Utility District	<p>c. Section 10-115(a)(4)(D)(ii): Compliance and Document Retention</p> <p>SMUD appreciates clarification that community solar administrators are responsible only for reviewing building owners' opt-out applications and are not the entities responsible for code compliance. As SMUD has previously stated, local building departments have jurisdiction over code enforcement, along with expertise and well-established processes. Community solar program administrators, which may include utilities or other public or private entities, are neither authorized nor equipped to manage compliance obligations and Title 24 code enforcement.</p> <p>While the 15-day language provides helpful clarification, SMUD recommends striking the following sentence from section 10-115(a)(4)(D)(ii): "The Administrator shall maintain record of the documentation that demonstrates and confirms the on-site solar generation system met the Opt-Out requirements the remainder of the Participation Period." This sentence would require administrators to retain records relating to former participants for up to twenty years. In many cases, administrators will have no ongoing relationship with those former participants yet will still bear the burden of record and information management for retention periods that will be unique to each customer (depending on when their Participation Period ends). The customer is the appropriate</p>	<p>The responsibility of an Administrator is to keep all records regarding participation of a building in the Community Solar program for the 20 year period. The purpose of this record-keeping requirement is to facilitate audits of administrator performance where necessary. Administrators will need to keep files on each participating building to accomplish this goal. The documents related to opt-out would be a small portion of such records and would be the last documents to a file that otherwise would continue to grow through the rest of the 20 year period. Staff determined that keeping those records in electronic files would not be a significant burden and that they are necessary and reasonable to facilitate and regulate the program.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239064&DocumentContentId=72900

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239064.008	Sacramento Municipal Utility District	3. 10-115(a)(6) and 10-115(a)(7): Location and Size While SMUD supports reasonable limits on generating resource size and location, SMUD echoes its earlier concerns that (a) with respect to location, the language should be clarified to recognize that a "distribution system" is subject to the design of the specific utility system; and (b) with respect to size, the regulations should be sufficiently flexible to allow projects sized to enable utilities to meet growth in demand. Addressing these concerns will be critical as the on-site solar requirements expand to building types other than single family residential.	Based on staff's analysis, staff determined that the change suggested by this comment would unreasonably limit flexibility necessary to meet growth in demand. Staff welcomes commenter to submit a proposal for the 2025 rulemaking, which staff will consider based on the information in the rulemaking record.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=72900
239064.009	Sacramento Municipal Utility District	4. 10-115(a)(8): Original Building Purchaser Choice SMUD supports removal of proposed section 10-115(a)(8) Original Building Purchaser Choice and appreciates staff's consideration of stakeholder feedback. As SMUD and others noted in prior comments, inclusion of an opt-out provision obviates the need for the Original Building Purchaser Choice provision. Moreover, requiring a builder to offer the option of installing an on-site solar generation system at the point of purchase would have created significant, costly burdens without corresponding benefits.	CEC appreciates the support	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=72900
239064.010	Sacramento Municipal Utility District	5. 10-115(c): Executive Director Approval of Revised Applications SMUD appreciates revisions to section 10-115(c), which clarify that future changes to the Energy Code will not impact existing program participants or resources. Addressing these concerns will be critical as the on-site solar requirements expand to higher load building types other than single family residential. SMUD also appreciates the additional guidance in this section regarding timelines for review and approval of revised applications, which will assist administrators with planning and preparing to adapt their programs to conform to new regulations.	CEC appreciates the support	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239064&DocumentContentId=72900
239065.001	San Francisco Public Utilities Commission	Add a new exception to the on-site solar and battery requirements (Section 140.10) for buildings served by utilities with technical and legal constraints that make offering Net Energy Metering ("NEM") compensation infeasible (proposed language presented below). Hetch Hetchy Power is proposing a new exception that is specific and limited so that it will not serve or be interpreted as a disincentive to complying with the Section 140.10 requirements.	The Hetch Hetchy Power (City of San Francisco) situation is unique and complicated. Nonetheless, the 10-109(k) process is designed precisely to handle such situations. Staff believes that section 10-109(k), as updated in the 2022 code cycle, can be used to address Hetch Hetchy Power's concerns. The CEC would welcome a draft application as soon as Hetch Hetchy is ready to submit it.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239065&DocumentContentId=72902

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239065.002	San Francisco Public Utilities Commission	<p>In situations where NEM compensation cannot be offered to customers due to technical infeasibility, on-site solar and battery storage system requirements will not be cost-effective and should thus not be required.</p> <p>It is widely understood that the on-site solar and battery storage measure is not cost-effective for customers who are not compensated for the excess generation their system exports back to the grid. Essentially, without an assumed NEM compensation benefit, the on-site solar and battery storage requirement would not be cost-effective over its lifetime. Before adopting a new measure, the Energy Commission must demonstrate that the measure is cost effective over the 30-year period of analysis.1 An exception to the requirement for specific customers for whom it is known that the measure will not be cost effective should be adopted for Section 140.10(a).</p> <p>Hetch Hetchy Power cannot feasibly provide NEM compensation to many of its customers for the specific and technical conditions explained below. Instead of having to rely on hoping that their utility applies for an exemption and that an after-the-fact review of Hetch Hetchy Power's circumstances will yield an exemption, Hetch Hetchy Power's customers should be exempt from the on site solar and battery storage requirements upfront and as part of the adoption of the 2022 Energy Code Update.</p>	<p>The Hetch Hetchy Power (City of San Francisco) situation is unique and complicated. Nonetheless, the 10-109(k) process is designed precisely to handle such situations. Staff believes that section 10-109(k), as updated in the 2022 code cycle, can be used to address Hetch Hetchy Power's concerns. The CEC would welcome a draft application as soon as Hetch Hetchy is ready to submit it.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239065&DocumentContentId=72502
239065.003	San Francisco Public Utilities Commission	<p>An exception written into the code section in addition to the five other existing exceptions included in the proposed code update is the best approach for two reasons:</p> <ol style="list-style-type: none"> 1) It is counterproductive to require customers for whom it is already known that on-site solar and battery systems will not be cost-effective to have to install on-site solar and battery systems unless their utility succeeds in applying for an exemption; and 2) The Section 10-109(k) application filed by a public entity must recommend limitations to the scope of the exemption determination being requested, but Hetch Hetchy Power is subject to the terms of three different interconnection agreements with two different entities. These interconnection agreements have different export limitations and interconnection fees that would apply to different types of buildings located in different areas, making a narrow scope very difficult to bundle into a single application. 	<p>The Hetch Hetchy Power (City of San Francisco) situation is unique and complicated. Nonetheless, the 10-109(k) process is designed precisely to handle such situations. Staff believes that section 10-109(k), as updated in the 2022 code cycle, can be used to address Hetch Hetchy Power's concerns. The CEC would welcome a draft application as soon as Hetch Hetchy is ready to submit it.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239065&DocumentContentId=72502

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239065.004	San Francisco Public Utilities Commission	<p>Although the Section 10-109(k) application for exemption process may seem a good fit for Hetch Hetchy Power's customers at first sight, a more detailed examination of the circumstances in which Hetch Hetchy Power operates illustrates that the technical and legal constraints in place make the Section 10- 109(k) process ill-fitting.</p> <p>Hetch Hetchy Power does not own most of the distribution system it uses to serve its customers. The City and County of San Francisco has entered into different interconnection agreements to enable Hetch Hetchy Power to serve its different customers. The majority of Hetch Hetchy Power's customers are served on Pacific Gas and Electric Company's ("PG&E") distribution system and are spread out across PG&E's distribution system. This arrangement is subject to the rates and terms of PG&E's federally-regulated Wholesale Distribution Tariff ("WDT") and the City and County of San Francisco's Service Agreement (Service Agreement No. 275) under the WDT. Under the WDT, PG&E decides, on a case-by-case basis depending on the location and size of the project, whether generation will be allowed to export onto its grid, which is necessary in order for Hetch Hetchy Power to offer compensation to its customers. In addition, PG&E's electric tariff for Net Energy Metering Service for City and County of San Francisco Municipal Load Served by Hetch Hetchy and Solar Generators ("NEMCCSF") compensates Hetch Hetchy Power for exports from only a limited set of customers.</p>	<p>The Hetch Hetchy Power (City of San Francisco) situation is unique and complicated. Nonetheless, the 10-109(k) process is designed precisely to handle such situations. Staff believes that section 10-109(k), as updated in the 2022 code cycle, can be used to address Hetch Hetchy Power's concerns. The CEC would welcome a draft application as soon as Hetch Hetchy is ready to submit it.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239065&DocumentContentId=72502
239065.005	San Francisco Public Utilities Commission	<p>For these reasons Hetch Hetchy Power recommends the following new exception:</p> <p>EXCEPTION 6 to Section 140.10(a). Buildings served by a utility that is unable to feasibly offer a NEM compensation benefit due to the terms of that utility's interconnection agreements, which were entered into before the adoption of Section 140.10(a).</p>	<p>The Hetch Hetchy Power (City of San Francisco) situation is unique and complicated. Nonetheless, the 10-109(k) process is designed precisely to handle such situations. Staff believes that section 10-109(k), as updated in the 2022 code cycle, can be used to address Hetch Hetchy Power's concerns. The CEC would welcome a draft application as soon as Hetch Hetchy is ready to submit it.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239065&DocumentContentId=72502
239066.001	Southern California Gas Company	<p>While mindful of the challenge to project into the future, we respectfully request that the CEC energy efficiency staff consult with CEC staff working on the energy demand forecast, concerning discrepancies that may exist between the rate forecasts used for the Proposed 2022 California Energy Code and the energy demand forecasts used for utility procurement plans. For example, the Proposed 2022 California Energy Code assumes increasing natural gas rates and decreasing electricity rates that plateau, despite large cost increases associated with wildfire hardening of the electric grid. We understand the process is near completion, so we suggest that the CEC consider third-party evaluations of the next building code cycle, which has worked well at the South Coast Air Quality Management District (SCAQMD).</p>	<p>On February 24, 2021, the California Public Utilities Commission (CPUC) held an En Banc session. During that En Banc session, the CPUC demonstrated that, contrary to this comment, the retail rate forecast for natural gas is extremely close to the forecast used for TDV through 2035, and lower thereafter if we assume a constant annual growth rate for the CPUC En Banc forecast.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239066&DocumentContentId=72501

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239066.002	Southern California Gas Company	<p>Unbundling the CEC's cost and benefit assumptions is critical to understanding the impact of the proposed code changes and assessing specific impacts on housing costs, as required by State Law. In our comments for the 45-day language, we asked for more clarification regarding the benefits of the measures as attributed to the residential sector and non-residential sector.¹ We greatly appreciate the CEC's clarification that the costs borne by the Proposed 2022 California Energy Code are 49 percent residential and 51 percent non-residential, while the benefits are 25 percent residential and 75 percent non-residential.² Since the benefits greatly favor the non-residential sector and the costs are split evenly between the two building types, the relative cost-effectiveness for the residential measures appears questionable.</p>	<p>The cost benefit difference between residential and nonresidential sectors does not affect the cost effectiveness of the adopted regulations. As required by the Warren-Alquist Act and California Health and Safety Code's nine point criteria, staff evaluated the adopted standards and determined that they are cost effective as a whole. Cost-effectiveness information associated with each measure is available on the docket, and can be found in the relevant CASE report, which forms the basis of the cost effectiveness calculation of each measure and of the standards as a whole.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239066&DocumentContentId=72501
239066.003	Southern California Gas Company	<p>Furthermore, the sensitivity analyses outlined in our previous comments suggest that reasonable changes to input assumptions, including equipment costs, operation and maintenance costs, and gas and electric price forecasts (including hydrogen, renewable natural gas, and synthetic gas) could result in heat pump water heaters not being cost effective in additional climate zones. Given this, it is in the public interest for the proposal to express, in detail, the granular costs and benefits attributable to each potential measure and how they will affect the cost-effectiveness for both the residential and non-residential sectors distinctly. In a 2017 report assessing how regulatory agencies can improve their analyses, the California Legislative Analyst Office (LAO) found that most State agencies do not adequately assess uncertainty and that sensitivity analyses "[provide] the agency and the public with a better understanding of the risks—both positive and negative— of a particular approach."³ SoCalGas continues to recommend that the CEC build in the uncertainty of the future by utilizing a range of rate forecasts to determine cost-effectiveness.</p>	<p>Staff review of cited NREL research and data provided by three largest HPWH heater manufacturers indicate that HPWHs have lower annualized than natural gas tankless maintenance costs including the estimated costs from these sources, HWPHs continue to have lower overall lifecycle costs compared to gas tankless water heaters.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239066&DocumentContentId=72501

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239066.004	Southern California Gas Company	<p>An effective assessment of uncertainty is critical when evaluating the implications of the cost benefit analysis of the proposed building code changes. Our review of the CEC's economic assessment identifies several areas where reasonable differences in assumptions surrounding technology and future energy prices and costs could change the results of the analysis used to support the Proposed 2022 California Energy Code. These include operations and maintenance (O&M) costs for heat pump water heaters, projections of natural gas rates, and projections of electricity rates. Cost assumptions, such as heat pump installation costs, based on a single data point also create significant uncertainty in the results, and raise questions regarding the validity of the results. Also, plateauing of electricity rates after 2030 does not seem reasonable given the trend toward expenditures to harden the system to prevent wildfire risks and Public Safety Power Shutoff (PSPS) events. For example, Pacific Gas & Electric's recent announcement that it expects to spend \$20 billion on underground transmission lines in the State illustrates how external factors and a changing climate can trigger unforeseen price impacts.⁴ Electricity price forecasts are a critical component of the analysis but include significant uncertainties that cannot be addressed unless they are identified and evaluated. Without an assessment of uncertainty, it is not possible to determine whether the selected baseline assumptions are biasing the conclusions of the analysis. The relatively small margin between costs and benefits observed in many of the climate zone specific analyses for water heaters</p>	<p>All of the proposed 'sensitivities' from SCG favor natural gas use. Staff notes that there are an equal number of possible changes that would favor electric use. Adjusting assumptions to favor one outcome over another does not provide much information without the likelihood of different outcomes attached. In addition, since this is a building standards proceeding, we must ultimately define a single building code based on the best available outlook. For these reasons, staff concluded that an expected value forecast using the best publicly available data at the time is appropriate.</p>	7/28/2021	15-Day	<p>https://efiling.energy.ca.gov/GetDocument.aspx?tn=239066&DocumentContentId=72501</p>
239066.005	Southern California Gas Company	<p>The 15-day language still includes two separate capture efficiencies for stove tops using electricity and natural gas. Since the act of cooking is a well-recognized source of particulate matter (PM 2.5) in homes and PM 2.5 can cause wheezing amongst asthmatic individuals, the most health protective approach to ventilation would be to require stove tops to have a single capture efficiency regardless of fuel source; and we recommend the more stringent capture efficiency. Furthermore, in future code cycles, we recommend utilizing data from the proposed CEC funded research on "Randomized Trial Study to Determine Impact of Gas Stove Interventions on Children Asthma" as studies up to now do not show conclusive evidence of needing higher capture efficiencies depending on fuel source. 5 A report published earlier this year by the CEC noted that "these results imply that gas cooking appliances in the HENGH homes did not lead to widespread problems with indoor NO2."</p>	<p>All cooking generates particulate matter and other aerosolized compounds, and natural gas cooking additionally produces nitrous oxides, carbon monoxide and other compounds resulting directly from combustion. Therefore, a gas cooking event that adds both combustion byproducts and cooking byproducts to the indoor air necessarily creates a greater mass of pollutants in need of removal compared to one that only adds cooking byproducts, and a higher airflow rate will logically be needed to transport that greater pollutant mass.</p>	7/28/2021	15-Day	<p>https://efiling.energy.ca.gov/GetDocument.aspx?tn=239066&DocumentContentId=72501</p>

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239066.006	Southern California Gas Company	<p>Since building code cycles occur every three years, one opportunity to continually refine the process is to look at best practices from other State government procedures. Independent, third party evaluations of a public agency's economic assessments can highlight both the strengths of their approach as well as identify areas for improvement, such as increasing transparency and clearly documenting data, methods, and assumptions. 7 In 2014, the SCAQMD's Governing Board approved an independent review of the agency's socioeconomic assessments with Board Members acknowledging that the agency may "appear biased to perform only an internal analysis of the cost-benefit of proposals" and that such review would "allow the Board to be better informed prior to approving regulations."8 As a result, SCAQMD worked with sister agencies, the regulated community, academia, environmental groups, and the public to enhance both the development and documentation of the socioeconomic assessment for the agency's 2016 Air Quality Management Plan, with clear direction to "...report not only on overall impacts, but to also discuss uncertainty and provide a range of estimates through sensitivity analyses." 9 With SCAQMD as an example of best practice, we respectfully request that an independent audit of the CEC's natural gas and electricity rate modeling be conducted before the next Energy Code Update. Doing so will allow Commissioners, individuals, and businesses to better understand the important tradeoffs between different compliance options.</p>	<p>Thank you for your comment. The concern raised here appears not to directly pertain to the 2022 Energy Code development cycle, but rather requests a comprehensive third-party evaluation (i.e. audit) of the Energy Commission's energy modeling and forecasting process as an input into policy decisions which may or may not directly concern the 2022 Energy Code. As no changes to code language are requested or suggested, none have been made.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239066&DocumentContentId=72501
239069.001	California Municipal Utilities Association	<p>While CMUA supports some of the language in the 15-Day Express Terms clarifying the process required for a building owner to Opt-Out, we remain concerned that the Opt-Out process, as described, will reduce the likelihood that builders, electric utilities, or other groups will provide this important compliance option. The impact of such a result will be disproportionately imposed on lower income home buyers. For the reasons addressed below, CMUA urges the Commission to revise the proposed changes to the CSS to avoid this inequitable outcome.</p>	<p>Allowance for participant opt-out is standard expectation for community solar programs offered voluntarily to customers. Having an opt-out option that requires installation of rooftop solar meeting the building's PV obligation will lead to far less opt-out than other voluntary community solar programs around the U.S. For these reasons, staff determined that the opt-out provision in the adopted language is necessary and reasonable for a sustainable community solar program in California.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239069&DocumentContentId=72506

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239069.002	California Municipal Utilities Association	<p>A. An unlimited Opt-Out increases risk and imposes risk-related costs on project administrators.</p> <p>CMUA appreciates that the Energy Commission has made clear that, "(p)rior to Opt-Out, the building owner must demonstrate that it has installed an on-site solar electric generation system and met the Opt-Out Requirements by providing documentation from the installer of the on-site solar system or an attestation of the building owner with supporting documentation". 4 CMUA further recognizes that the Energy Commission has made clear that "(t)he building owner shall be responsible for all costs associated with documenting that the onsite solar generation system satisfies the Opt-Out Requirements". 5 However, the 15-Day Express Terms also state that the project administrator shall not impose any penalty related to a participating building's Opt-Out, or charge participants any unrealized revenue due to the building owner's Opt-Out. 6 If this language remains, it will not only require that a CSS project administrator assume all risk of project performance, it will allow a building owner to avoid costs it imposed upon CSS administrator when opting out of a long-term project agreement.</p> <p>While administering a CSS project will become more complicated if a building owner opts out, this asymmetric risk approach, in which a building owner can legally avoid costs it imposes when opting out, further reduces the likelihood that any organization would be willing to develop a CSS project.</p>	<p>Staff appreciates the comment. Based on extensive feedback on community solar programs, staff determined that an opt out provision is in the public interest and will serve the ends of the regulation. Staff notes, however, that opt-out provisions are not unlimited, but rather require several conditions before a participating building can opt-out of the community solar program. Both utilizing the the community solar exception and participating as an administrator is optional. Staff worked extensively with stakeholders to reduce burdens on the administrators and maximize the benefits to both administrators and participating buildings. Staff will continue working with stakeholders through implementation of the program.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239069&DocumentContentId=72506
239069.003	California Municipal Utilities Association	<p>B. CSS project administrators are not responsible for the code compliance of Opt-Outs.</p> <p>CMUA agrees with the December 23, 2020, comments offered by Sacramento Municipal Utility District (SMUD)7 regarding compliance verification. CSS project administrators are obligated to submit required information to ensure the project's compliance with California building code. The nature of the CSS program ensures project compliance with the code over the full 20-year term. If a building owner opts out of a CSS project, the building is, by that decision, no longer part of the CSS project. It is unreasonable to expect a CSS project administrator to confirm a building owner's compliance with California building code. The CSS project administrator has no legal ability, authority, or responsibility to assure a private building owner's compliance with California building code once the building owner is no longer a part of the CSS project. Code Compliance is the responsibility of local regulatory authorities, not a CSS project administrator. To the extent the Energy Commission requires project administrators to engage in any compliance-related reviews, it is critical that Title 24 ensures that the costs of performing such work are recoverable by the project administrator.</p>	<p>Staff appreciates the comment. Based on extensive feedback on community solar programs, staff determined that an opt out provision is in the public interest and will serve the ends of the regulation. Both utilizing the the community solar exception and participating as an administrator is optional.</p> <p>The obligation to install a rooftop PV system that meets or exceeds the size required by the Standards in effect at the time that home was built, prior to discontinuing participation in a community solar program, is implemented by contractual obligations that the Administrator must ensure. The obligation is a condition of participation in the program from the outset and should be communicated by the administrator as such. It is the administrator's responsibility to enforce their contractual agreement with the customer that the equivalent onsite PV system gets installed.</p> <p>CEC staff worked with stakeholders to minimize any burden on the administrator related to facilitating the exercise of the opt-out option and provided that any balance of costs or benefits owed to either party at the time of Opt-Out shall be paid to the party owed. However, the costs and benefits associated with participating in the community solar program cease at the time of opt-out. Staff will continue working with stakeholders through implementation of the program.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239069&DocumentContentId=72506

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239070.001	Statewide Utility Codes and Standards Enhancement Team	<p>Fan Energy Index</p> <p>Initially, the Statewide CASE team recommended that the new mandatory FEI requirements be 1.0 for all in-scope fans. This was a slightly more stringent requirement than the ASHRAE 90.1-2019 requirement that fans serving multi-zone VAV systems only had to achieve a 0.95 FEI. However, stakeholder feedback recommended that Title 24, Part 6 align with ASHRAE 90.1, which the Statewide CASE Team agreed with. Additional stakeholder feedback resulted in Exception 1 to Section 120.10(a) being reworded to make it clearer that its intention is to exclude any products anticipated to have DOE appliance regulations in the near future (i.e., dehumidifying DX-DOAS and computer room ACs).</p> <p>Summary of Changes to FEI Submeasure Substantive change:</p> <ul style="list-style-type: none"> • Changed MZ-VAV FEI requirement from 1.0 to 0.95. <p>Editorial change:</p> <ul style="list-style-type: none"> • Adjusted language in Exception 1 to Section 120.10(a) intended to exclude any product categories that are subject to upcoming DOE appliance regulations (CRACs & DDX-DOAS). 	Staff agrees with these updates in response to stakeholder feedback and have included these revisions.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239070&DocumentContentId=72905
239070.001	Statewide Utility Codes and Standards Enhancement Team	<p>Fan Energy Index</p> <p>Initially, the Statewide CASE team recommended that the new mandatory FEI requirements be 1.0 for all in-scope fans. This was a slightly more stringent requirement than the ASHRAE 90.1-2019 requirement that fans serving multi-zone VAV systems only had to achieve a 0.95 FEI. However, stakeholder feedback recommended that Title 24, Part 6 align with ASHRAE 90.1, which the Statewide CASE Team agreed with. Additional stakeholder feedback resulted in Exception 1 to Section 120.10(a) being reworded to make it clearer that its intention is to exclude any products anticipated to have DOE appliance regulations in the near future (i.e., dehumidifying DX-DOAS and computer room ACs).</p> <p>Summary of Changes to FEI Submeasure Substantive change:</p> <ul style="list-style-type: none"> • Changed MZ-VAV FEI requirement from 1.0 to 0.95. <p>Editorial change:</p> <ul style="list-style-type: none"> • Adjusted language in Exception 1 to Section 120.10(a) intended to exclude any product categories that are subject to upcoming DOE appliance regulations (CRACs & DDX-DOAS). 	Staff appreciates CASE team's outreach and was involved during the discussions. Staff have included these changes into the language.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239070&DocumentContentId=72905

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239070.002	Statewide Utility Codes and Standards Enhancement Team	<p>Fan Power Budget Submeasure</p> <p>Since the Final CASE report was posted in September 2020, numerous discussions and engagement with stakeholders has taken place, including with equipment manufacturers, energy efficiency advocates, and the design community. The fan power budget changes originally recommended in the September 2020 CASE Report were substantial and the Statewide CASE Team has continued to be receptive to stakeholder feedback. Every change enumerated below was made in response to a specific stakeholder concern. The changes are intended to make the new fan power budget better reflect actual designs and conditions encountered in the field. As noted above, the changes resulted from numerous discussions and meetings with stakeholders. However, there are several docketed comments from stakeholders that were particularly important for adjusting the fan power budget submeasure, which are listed for reference: • AHRI3 • Daikin Applied4 • Carrier5 • AHRI6 • Trane7 • Carrier8</p> <p>The substantive changes summarized below strike an appropriate balance between addressing stakeholder concerns and preserving the original goals of the submeasure, which were to improve the layout and increase the stringency of the fan power budget.</p> <p>Summary of Changes to Fan Power Budget Submeasure Substantive changes Changes from CASE Report to Express Terms</p>	Staff agrees with these updates in response to stakeholder feedback and have included these revisions.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239070&DocumentContentId=72505
239070.002	Statewide Utility Codes and Standards Enhancement Team	<p>Fan Power Budget Submeasure</p> <p>Since the Final CASE report was posted in September 2020, numerous discussions and engagement with stakeholders has taken place, including with equipment manufacturers, energy efficiency advocates, and the design community. The fan power budget changes originally recommended in the September 2020 CASE Report were substantial and the Statewide CASE Team has continued to be receptive to stakeholder feedback. Every change enumerated below was made in response to a specific stakeholder concern. The changes are intended to make the new fan power budget better reflect actual designs and conditions encountered in the field. As noted above, the changes resulted from numerous discussions and meetings with stakeholders. However, there are several docketed comments from stakeholders that were particularly important for adjusting the fan power budget submeasure, which are listed for reference: • AHRI3 • Daikin Applied4 • Carrier5 • AHRI6 • Trane7 • Carrier8</p> <p>The substantive changes summarized below strike an appropriate balance between addressing stakeholder concerns and preserving the original goals of the submeasure, which were to improve the layout and increase the stringency of the fan power budget.</p> <p>Summary of Changes to Fan Power Budget Submeasure Substantive changes Changes from CASE Report to Express Terms</p>	Staff appreciates CASE team's outreach and was involved during the discussions. Staff have included these changes into the language.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239070&DocumentContentId=72505

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239070.003	Statewide Utility Codes and Standards Enhancement Team	Updates to Tables Showing Underlying Static Pressures Appendix N of the Final CASE Report described the underlying methodology necessary to calculate the watts per cubic feet per minute (W/cfm) values that end up in Tables 140.4-A B and Table 141.0-D. Due to the changes highlighted above, there were changes to some of the underlying static pressure values. The static pressure values shown below align with what has been included in the Energy Commission's 15-Day Language. For convenience, all static pressure values have been reproduced in Table 1, Table 2, and Table 3 below. Changed static pressure values are highlighted in red.	Staff agrees with these updates in response to stakeholder feedback and have included these revisions.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239070&DocumentContentId=72905
239070.003	Statewide Utility Codes and Standards Enhancement Team	Updates to Tables Showing Underlying Static Pressures Appendix N of the Final CASE Report described the underlying methodology necessary to calculate the watts per cubic feet per minute (W/cfm) values that end up in Tables 140.4-A B and Table 141.0-D. Due to the changes highlighted above, there were changes to some of the underlying static pressure values. The static pressure values shown below align with what has been included in the Energy Commission's 15-Day Language. For convenience, all static pressure values have been reproduced in Table 1, Table 2, and Table 3 below. Changed static pressure values are highlighted in red.	Staff appreciates the comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239070&DocumentContentId=72905
239071.001	Statewide Utility Codes and Standards Enhancement Team	<p>Response: While Vertiv's proposal may have shown a pumped refrigerant economizer to be more efficient than a baseline water economizer system, there were flaws in the simulation, including the baseline CRAH fan operation. Therefore, the results shown in Vertiv's proposal are not valid to justify a pumped refrigerant economizer being equivalent or better in energy performance to a baseline water economizer system, and additional analysis was needed.</p> <p>The economizer type's hours of operation difference (pumped refrigerant vs. evaporative cooling tower water economizer) is not the only factor impacting energy savings. The pumped refrigerant economizer system utilizes an air-cooled CRAC cooling system which is an entirely different system from a water-cooled chiller with evaporative cooling towers system. A water-cooled chiller system with evaporative cooling towers has efficiency values about twice the COP of an air-cooled CRAC. This inherent system efficiency difference is a major factor impacting the overall energy comparison between these two economizer system types.</p>	<p>Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal.</p> <p>At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72904

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239071.002	Statewide Utility Codes and Standards Enhancement Team	Response: The energy modeling that supported the Statewide CASE Team's analysis utilized annual hourly simulations using EnergyPlus (the same engine used by Title 24 compliance software CBECC-Com). The full-load COPs reported are done to establish an efficiency metric that is reported by manufacturers, in order to reflect the modeled energy use. The simulations used the 10%-incremental part-load curves and part-load COPs provided by Vertiv. Supply fan energy inputs in the model were changed to be equal in the baseline and proposed cases (and to match 140.9(a) minimum requirements) in order to isolate the energy savings of the economizer for the cooling system.	Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal. At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
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239071.003	Statewide Utility Codes and Standards Enhancement Team	Response: We disagree that the supply fan energy should be included in the energy equivalence comparison. The code change proposal for refrigerant economizers included them as an economizer option under 140.9(a)1, not as a packaged standalone product (which could be permitted via the performance pathway). Title 24, Part 6 has separate supply fan requirements in 140.9(a)2 and 120.6 which are not being changed as part of adding refrigerant economizers to 140.9(a)1 and 141.1(b).	Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal. At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504

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239071.004	Statewide Utility Codes and Standards Enhancement Team	Response: The commentor appears to misunderstand this chart (Figure 1 in the comment letter TN238233). The chart shows the percent annual energy savings of a pumped refrigerant economizer as proposed in the 2022 Title 24, Part 6 15-Day Language (which includes a 50F outdoor dry-bulb full economizer threshold for refrigerant economizers), compared to the 2022 Title 24, Part 6 15-Day Language minimally-compliant baseline water economizer system (which includes a 45F outdoor wet-bulb full economizer threshold). The pumped refrigerant economizer code change proposal only compared a refrigerant economizer to the 2019 Title 24, Part 6 water economizer baseline (35F outdoor wet-bulb full economizer threshold), but since the water economizer baseline in 2022 is anticipated to decrease in energy use (per 15-Day language which increases the outdoor wet-bulb temperature for full water economizing), this chart is needed to demonstrate how the proposed 15-Day Language for refrigerant economizers did not result in energy equivalence to other economizer systems, specifically a baseline water economizer with water-cooled chillers.	Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal. At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72904
239071.004	Statewide Utility Codes and Standards Enhancement Team	Response: The commentor appears to misunderstand this chart (Figure 1 in the comment letter TN238233). The chart shows the percent annual energy savings of a pumped refrigerant economizer as proposed in the 2022 Title 24, Part 6 15-Day Language (which includes a 50F outdoor dry-bulb full economizer threshold for refrigerant economizers), compared to the 2022 Title 24, Part 6 15-Day Language minimally-compliant baseline water economizer system (which includes a 45F outdoor wet-bulb full economizer threshold). The pumped refrigerant economizer code change proposal only compared a refrigerant economizer to the 2019 Title 24, Part 6 water economizer baseline (35F outdoor wet-bulb full economizer threshold), but since the water economizer baseline in 2022 is anticipated to decrease in energy use (per 15-Day language which increases the outdoor wet-bulb temperature for full water economizing), this chart is needed to demonstrate how the proposed 15-Day Language for refrigerant economizers did not result in energy equivalence to other economizer systems, specifically a baseline water economizer with water-cooled chillers.	Staff appreciates the work the CASE team's work along side discussions with Vertiv. The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72904

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239071.005	Statewide Utility Codes and Standards Enhancement Team	Response: We did not assume the Vertiv energy model reflected 100% economizer mode up to 50F dry-bulb; the model shows full economizing at 40F dry-bulb and partial economizing up to around 60F dry-bulb. However, since the 15-Day Language includes a 50F dry-bulb full economizing requirement for pumped refrigerant economizers, the Vertiv pumped refrigerant economizer is required to meet that threshold to be permitted prescriptively, and an analysis using 50F dry-bulb full economizing temperature to calculate pumped refrigerant economizer energy was needed. This resulted in reduced energy use by the pumped refrigerant economizer. Reasonable engineering adjustments were used based on the 40F full economizer part-load curves provided by Vertiv to adjust the pumped refrigerant economizer annual energy performance for a 50F dry-bulb full economizing temperature and estimated 70F maximum partial economizing temperature, using CEC weather data for each climate zone. To make energy adjustments, a percent cooling energy reduction was applied to the model results based on the percent difference in economizer hours using CEC annual hourly weather data. This included both a percent increase in full economizing hours and a percent increase in partial-economizing hours.	Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal. At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?ei=239071&DocumentContentId=72904
239071.005	Statewide Utility Codes and Standards Enhancement Team	Response: We did not assume the Vertiv energy model reflected 100% economizer mode up to 50F dry-bulb; the model shows full economizing at 40F dry-bulb and partial economizing up to around 60F dry-bulb. However, since the 15-Day Language includes a 50F dry-bulb full economizing requirement for pumped refrigerant economizers, the Vertiv pumped refrigerant economizer is required to meet that threshold to be permitted prescriptively, and an analysis using 50F dry-bulb full economizing temperature to calculate pumped refrigerant economizer energy was needed. This resulted in reduced energy use by the pumped refrigerant economizer. Reasonable engineering adjustments were used based on the 40F full economizer part-load curves provided by Vertiv to adjust the pumped refrigerant economizer annual energy performance for a 50F dry-bulb full economizing temperature and estimated 70F maximum partial economizing temperature, using CEC weather data for each climate zone. To make energy adjustments, a percent cooling energy reduction was applied to the model results based on the percent difference in economizer hours using CEC annual hourly weather data. This included both a percent increase in full economizing hours and a percent increase in partial-economizing hours.	Staff appreciates the work the CASE team's work along side discussions with Vertiv. The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?ei=239071&DocumentContentId=72904

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239071.006	Statewide Utility Codes and Standards Enhancement Team	<p>Response: While a full-load COP was reported in the analysis, part-load efficiency data (at 10% increments provided by Vertiv) was used in an annual hourly model to demonstrate equivalence. All part-load efficiency data was scaled linearly with the full load COP during simulation to demonstrate energy equivalence.</p> <p>We are not proposing that full load COP is the only factor being used to show energy equivalence. It is important to recognize that the COP is for a pumped refrigerant economizer system with air-cooled DX cooling, and this combination of economizer operation and cooling equipment efficiency provides energy equivalence. In contrast, an air-cooled CRAC without a refrigerant economizer but with the COP listed in the tables presented would not show energy equivalence to a baseline water economizer system.</p>	<p>Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal.</p> <p>At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.006	Statewide Utility Codes and Standards Enhancement Team	<p>Response: While a full-load COP was reported in the analysis, part-load efficiency data (at 10% increments provided by Vertiv) was used in an annual hourly model to demonstrate equivalence. All part-load efficiency data was scaled linearly with the full load COP during simulation to demonstrate energy equivalence.</p> <p>We are not proposing that full load COP is the only factor being used to show energy equivalence. It is important to recognize that the COP is for a pumped refrigerant economizer system with air-cooled DX cooling, and this combination of economizer operation and cooling equipment efficiency provides energy equivalence. In contrast, an air-cooled CRAC without a refrigerant economizer but with the COP listed in the tables presented would not show energy equivalence to a baseline water economizer system.</p>	<p>Staff appreciates the work the CASE team's work along side discussions with Vertiv. The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.007	Statewide Utility Codes and Standards Enhancement Team	<p>Response: This comment makes incorrect assertions to the modeling process. Since 140.9(a)2 has requirements for computer room supply fan power, that was used to adjust fan power. Title 24, Part 6's maximum fan power at design conditions applies to all conditions, such as external static pressure or filtration levels. An assumption had to be made to calculate Net Sensible COP (AHRI rating) from cooling COP. Alternatively, 140.9(a)1 could require a minimum cooling COP for refrigerant economizers, but that would be more difficult to enforce since manufacturers do not typically list cooling COP for CRACs.</p>	<p>Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal.</p> <p>At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.007	Statewide Utility Codes and Standards Enhancement Team	<p>Response: This comment makes incorrect assertions to the modeling process. Since 140.9(a)2 has requirements for computer room supply fan power, that was used to adjust fan power. Title 24, Part 6's maximum fan power at design conditions applies to all conditions, such as external static pressure or filtration levels. An assumption had to be made to calculate Net Sensible COP (AHRI rating) from cooling COP. Alternatively, 140.9(a)1 could require a minimum cooling COP for refrigerant economizers, but that would be more difficult to enforce since manufacturers do not typically list cooling COP for CRACs.</p>	<p>Staff appreciates the work the CASE team's work along side discussions with Vertiv. Staff have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504

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239071.008	Statewide Utility Codes and Standards Enhancement Team	Response: The 95F return air temperature was only meant to be an illustrative example of refrigerant economizer full economizing temperature capabilities. It was not used in any of the energy analysis.	Staff appreciates this response.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.008	Statewide Utility Codes and Standards Enhancement Team	Response: The 95F return air temperature was only meant to be an illustrative example of refrigerant economizer full economizing temperature capabilities. It was not used in any of the energy analysis.	Staff appreciates the work the CASE team's work along side discussions with Vertiv. The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.009	Statewide Utility Codes and Standards Enhancement Team	Response: The statement that our minimum efficiency values only account for full-load operation is incorrect. Annual hourly energy simulations were done using the part-load pumped refrigerant economizer efficiency data provided from Vertiv. Part load efficiency and economizing conditions were incorporated into the analysis, and each part-load COP was assumed to be scaled linearly with the full-load COP in the energy simulation. This is a similar methodology that is used to establish exceptions to nonresidential (non computer room) economizer use under 2019 Exception 4 to 140.4(e)1. As noted above, it is important to recognize that the COPs presented are for a pumped refrigerant economizer system, and the combination of cooling equipment (air-cooled DX CRAC) efficiency and economizer operation provides energy equivalence. In contrast, an air-cooled CRAC without a refrigerant economizer but with the COP listed in the tables we presented would not show energy equivalence to a baseline water economizer system.	Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal. At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.009	Statewide Utility Codes and Standards Enhancement Team	Response: The statement that our minimum efficiency values only account for full-load operation is incorrect. Annual hourly energy simulations were done using the part-load pumped refrigerant economizer efficiency data provided from Vertiv. Part load efficiency and economizing conditions were incorporated into the analysis, and each part-load COP was assumed to be scaled linearly with the full-load COP in the energy simulation. This is a similar methodology that is used to establish exceptions to nonresidential (non computer room) economizer use under 2019 Exception 4 to 140.4(e)1. As noted above, it is important to recognize that the COPs presented are for a pumped refrigerant economizer system, and the combination of cooling equipment (air-cooled DX CRAC) efficiency and economizer operation provides energy equivalence. In contrast, an air-cooled CRAC without a refrigerant economizer but with the COP listed in the tables we presented would not show energy equivalence to a baseline water economizer system.	Staff appreciates the work the CASE team's work along side discussions with Vertiv. The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504

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239071.01	Statewide Utility Codes and Standards Enhancement Team	Response: The intent of our comment letter was to provide analysis results for minimum energy efficiency requirements for refrigerant economizers to be energy equivalent to Title 24 baseline economizer systems (specifically a water economizer with evaporative cooling towers and water-cooled chillers). California is not governed by ASHRAE 90.1, and there are many instances where Title 24 sets higher efficiency standards than ASHRAE 90.1, including computer room economizer requirements.	Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal. At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.010	Statewide Utility Codes and Standards Enhancement Team	Response: The intent of our comment letter was to provide analysis results for minimum energy efficiency requirements for refrigerant economizers to be energy equivalent to Title 24 baseline economizer systems (specifically a water economizer with evaporative cooling towers and water-cooled chillers). California is not governed by ASHRAE 90.1, and there are many instances where Title 24 sets higher efficiency standards than ASHRAE 90.1, including computer room economizer requirements.	Staff appreciates the work the CASE team's work along side discussions with Vertiv. Staff have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.011	Statewide Utility Codes and Standards Enhancement Team	Response: While the 2019 computer room economizer system types in 140.9(a)1 may not be ideal for all data centers, they establish California's minimum prescriptive efficiency requirements. It is not in California's best interest to allow less efficient economizer technologies simply for the sake of flexibility. Other technology types not listed prescriptively may be permitted via the performance path if they can show energy equivalence.	Staff agrees with the CASE team and appreciate the work done in the analysis of Vertiv's proposal. At this time staff have determined to not include proposed language regarding pumped refrigerant economizers.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.011	Statewide Utility Codes and Standards Enhancement Team	Response: While the 2019 computer room economizer system types in 140.9(a)1 may not be ideal for all data centers, they establish California's minimum prescriptive efficiency requirements. It is not in California's best interest to allow less efficient economizer technologies simply for the sake of flexibility. Other technology types not listed prescriptively may be permitted via the performance path if they can show energy equivalence.	Staff appreciates the work the CASE team's work along side discussions with Vertiv. Staff have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504
239071.012	Statewide Utility Codes and Standards Enhancement Team	The 15-Day Language added Table 141.1-A Net Sensible COP By Climate Zone for Alterations. However, values shown in Table 141.1-A in the 15-Day Language are based on an energy-equivalent refrigerant economizer analysis using a 50F outdoor dry-bulb full economizing temperature (matching 140.9(a)1). However, 141.1 only requires 40F dry-bulb for full refrigerant economizing, so the values in Table 141.1-A should reflect a 40F dry-bulb full economizing temperature. T he results of this energy-equivalence analysis are in the table below; the COPs required for energy equivalence are a little higher than what is in the 15-Day Language due to there being fewer refrigerant economizer hours with a 40F vs. 50F outdoor dry bulb full economizing threshold. See below for a marked up version of the 15-Day Express Terms with our suggested revisions. Our recommended language insertions are double underlined in purple and recommended language deletions are struck in purple.	Staff appreciates the work the CASE team's work along side discussions with Vertiv. Staff have determined not to adopt any language regarding refrigerant economizers for data centers due to limited information.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239071&DocumentContentId=72504

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239072.001	Vertiv	Vertiv Group Corporation ("Vertiv") submits these comments in response to Comment #238848 in this docket, submitted on July 14, 2021, which contains the proposed language in the "15-Day Express Terms 2022 Energy Code – Residential and Nonresidential," (the "15-Day Express Terms"). Vertiv opposes the adoption of the Net Sensible Coefficient of Performance ("NSenCOP") prescriptive metrics that were added to Tables 140.9-A "Minimum Pumped Refrigerant Economizer CRAC Net Sensible COP by Climate Zone" and 141.1-A "Net Sensible COP By Climate Zone for Alterations" for refrigerant economizers serving computer rooms. As further discussed in these comments, the metrics in these tables are unsubstantiated, excessively restrictive, and impossible to comply with as written. The metrics have not been vetted through meaningful industry involvement, contain significant errors, and are being hastily added to the 15-Day Express Terms with an unreasonably abbreviated timeline for review.	Staff has not found any evidence to not include the NSenCOP which attempts to equalize the energy savings between the alternate prescriptive pathways. The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72503
239072.002	Vertiv	By contrast, Vertiv supports the NSenCOP mandatory metrics added in Table 110.2-L "Floor Mounted Air Conditioners and Condensing Units Serving Computer Rooms – Minimum Efficiency Requirements" of the 15-Day Express Terms. Unlike the prescriptive metrics added to Tables 140.9-A and 141.1-A, the mandatory metrics are adopted from those published in ANSI/ASHRAE/IES Standard 90.1-2019 "Energy Standard for Buildings Except Low-Rise Residential Buildings," which have been vetted by industry-trusted groups, including the ASHRAE 90.1 committee, AHRI 1360 committee, and the Department of Energy ("DOE"). This table reflects the appliance energy conservation standards that DOE has indicated it will adopt within the next 18 months, and which will apply to the products at issue here. See "Preliminary Analysis Regarding Energy Efficiency Improvements in ANSI/ASHRAE/IES Standard 90.1-2019."	Staff appreciates the supportive comment regarding Table 110.2.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72503

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239072.003	Vertiv	<p>For the following reasons, Vertiv strongly urges the California Energy Commission (“CEC” or “Commission”) to reject adoption of the NSenCOP metrics added in Tables 140.9-A and 141.1-A of the 15-Day Express Terms:</p> <ul style="list-style-type: none"> The proposed metrics in Tables 140.9-A and 141.1-A improperly reference and misapply the definitions and calculation methods within AHRI Standard 1360. In an attempt to develop “equivalency” metrics for refrigerant economizer technology, the proposed NSenCOP prescriptive metrics distort AHRI 1360’s intended purpose. Despite referencing AHRI 1360, which contains specific testing conditions and metrics, Section 100.1 “Definitions and Rules of Construction” of the proposed 2022 Energy Code defines the NSenCOP metric differently from the definition of NSenCOP contained in Section 3.11 of AHRI 1360. The definition in Section 100.1 purports to adopt the “Standard Rating Conditions table(s) of AHRI 1360,” which represents a single testing condition under static inputs. However, a portion of the data used in CASE’s analysis explaining how it developed the NSenCOP prescriptive metrics (“Analysis Report”) represents annualized performance data including full load, partial economizer, and full economizer hours. Static inputs under a single testing condition cannot be properly compared to annualized performance data to develop equivalency metrics. Contrary to what is required under AHRI 1360, CASE did not calculate Vertiv’s energy model at standard operating conditions (i.e., model included higher External Static 	<p>The analysis from the CASE team included part load efficiencies and was found to not be enough to be equivalent to alternate proposals. The NSenCOP ratings from AHRI 1360 are intended to be tested based on the AHRI1360 conditions. This is similar to other parts of the Building Codes where other types of equipment need some metric to be equivalent, similar to water economizers and air economizers having different outdoor air temperatures.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=2390728.DocumentContentId-72503
239072.004	Vertiv	<ul style="list-style-type: none"> Manufacturers of refrigerant economizers cannot comply with the proposed metrics in Tables 140.9-A and 141.1-A as they are written because the metrics do not provide necessary testing inputs. In order to comply with the proposed NSenCOP metrics, a manufacturer must have specific inputs such as return air temperature, heat rejection and cooling fluid conditions, and external static pressure. Contrary to the proposed metrics, AHRI Standard 1360 Section 6. “Rating Requirements” includes the following tables detailing specific inputs used to calculate NSenCOP: <ol style="list-style-type: none"> “Table 2. Indoor Return Air Temperature Standard Rating Conditions” lists the Return Dry-bulb/ Dew-point in degrees F. “Table 3. Heat Rejection/ Cooling Fluid Standard Rating Conditions” lists the specific Test Condition, which is dependent on System Type. “Table 4. Minimum External Static Pressure Standard Rating Conditions” lists the External Static Pressure, which is dependent on the ASHRAE Standard Model (airflow configuration) and Net Sensible Cooling Capacity (“NSCC”) of the equipment. <p>Without these specific inputs, refrigerant economizer manufacturers cannot calculate compliance to the proposed prescriptive metrics.</p>	<p>The intent of the NSenCOP ratings is not to require testing under new conditions, but to set a minimum rating based on the conditions set by AHRI 1360.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=2390728.DocumentContentId-72503

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239072.005	Vertiv	<ul style="list-style-type: none"> The proposed metrics in Tables 140.9-A and 141.1-A improperly ignore refrigerant economizers' various efficiency capabilities and instead impose one single efficiency value per Climate Zone. By imposing one prescriptive NSenCOP for each Climate Zone, the prescriptive metrics discount the numerous operating conditions that have a significant effect on efficiency performance—including airflow configuration, return air temperature, and the cooling capacity of the technology. By contrast, Table 110.2-L in the proposed language includes metrics that match the methodology in ASHRAE 90.1-2019 Table 6.8.1-10 "Floor Mounted Air Conditioners and Condensing Units Serving Computer Rooms – Minimum Efficiency Requirements," where the mandatory NSenCOP metrics vary based on the Standard Model (or airflow configuration) and the NSCC. Rather than imposing a single efficiency value, these mandatory values range from 1.89 up to 2.70 and are calculated from varying Return Air Dry Bulb Temperatures and External Static Pressures. 	<p>The table metrics alone do not provide energy equivalence to alternate proposals. The table metric with a pumped refrigerant economizer are both required to be energy equivalent to a water economizer. This includes the various efficiency capabilities as well as the single efficiency value based on the analysis provided on record.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72501
239072.006	Vertiv	<ul style="list-style-type: none"> Vertiv's data was improperly manipulated without knowledge of Vertiv's products in order to derive the metrics added in Tables 140.9-A and 141.1-A. When Vertiv originally submitted its data in relation to its proposal to add PRE technology as a prescriptive requirement in Title 24, Vertiv never anticipated that its data would be used to calculate prescriptive efficiency metrics in the NSenCOP table. Indeed, its data is not suitable for such purpose. The data Vertiv submitted was specific to only one of its numerous models of PRE technology. As CASE explained during the roundtable on July 26, it had to make a number of assumptions with Vertiv's data to derive the efficiency metrics—assumptions that CASE admitted could be incorrect. In manipulating and misapplying Vertiv's energy model, the Commission is creating a precedent that will discourage industry and other stakeholders from sharing information with the Commission in future proceedings. 	<p>Vertiv was made aware that anything received by the Commission is public and the Commission is not liable for the use of public information by other stakeholders.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72501

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239072.007	Vertiv	<ul style="list-style-type: none"> Six of the proposed metrics added in Tables 140.9-A and 141.1-A are erroneous in that they inexplicably fall below the mandatory requirements of Table 110.2-L. The CASE comment fails to explain why the NSenCOP for a number of prescriptive requirements are lower than the mandatory requirements for the same Climate Zone. Under CEC regulations, the mandatory requirements are intended to impose a floor for energy efficiency, and prescriptive requirements impose more stringent requirements. Promulgating prescriptive efficiency metrics that are lower than the mandatory requirements is not only confusing for regulated stakeholders, but also shows that the methodology used to develop the prescriptive metrics is flawed. This is in addition to the fact that regulated stakeholders are not provided with any inputs to facilitate compliance to the proposed metrics. We note that CEC staff signaled that these values were in fact erroneous and would be revised; however, even in that case, no revised values have been made publicly available for review as part of the 15-day comment period, meaning that no stakeholders have reviewed them. 	<p>The table metrics provided the minimum requirement in combination with the pumped refrigerant economizer to be at least equivalent to an alternative proposal. Mandatory requirements would take precedent over values that were lower.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239072&DocumentContentId=72503
239072.008	Vertiv	<ul style="list-style-type: none"> In an effort to create “equivalency” metrics for refrigerant economizers, reflected in the proposed metrics in Tables 140.9-A and 141.1-A, CASE adjusted supply-fan performance, thereby creating an arbitrary data set for a completely fictitious refrigerant economizer. By devaluing the supply-fan performance in Vertiv’s energy models, CASE’s data analysis no longer reflects the actual performance of the modelled refrigerant economizer. Adjusting the efficiency performance of the supply-fan—a component inherent to refrigerant economizers—discredits the actual efficiency of the economizer system and distorts the data in the economizer energy model. Even more concerning, this adjusted data used by the CASE team does not correspond to any actual refrigerant economizer in existence—it is totally fictitious. Adoption of metrics that will regulate actual refrigerant economizers based on data derived from modeling fictitious devices would be outrageous. In addition to Vertiv’s concerns about this in the current matter, Vertiv is also concerned that promulgating regulations based on data derived from fictitious devices would set a troubling precedent. 	<p>Staff has discussed with Vertiv in numerous meetings this is the correct approach for a prescriptive alternative analysis prior to the 45 day workshop and CEC was not provided an alternative analysis. The analysis should isolate the economizer since this proposal is intended for economizers.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239072&DocumentContentId=72503

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239072.009	Vertiv	<ul style="list-style-type: none"> Partial economizer hours are improperly factored into the analysis used to develop the metrics in Tables 140.9-A and 141.1-A. As a threshold matter, the revised code does not provide any parameters—such as temperature thresholds—to clarify the term “partial economizer.” Without specific inputs, partial economization can mean the unit is consuming power anywhere between 1% load addressed with compressor(s) and 99% load from economizing to 99% load addressed with compressor(s) and 1% load from economizing, including all possible percentage splits in between. Thus, power consumption under partial economization can vary significantly from full economization. Despite this, the Analysis Report treats values derived from partial and full economization as equal by adding them together to create total economization hours over the course of a year. This is an erroneous method that produces inherently flawed data. The flawed economization hours are then used as the basis for the NSenCOP prescriptive metrics, which are accordingly also erroneous. 	<p>Staff has found that the analysis considered part time economizing and full time economizing in determining the NSenCOP. As mentioned in earlier comments NSenCOP is determined by the conditions in the test procedure AHRI 1360. Partial economizing is intended to require economizing in tangent with mechanical cooling to help offset the load. The code language is not a test procedure.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72901
239072.010	Vertiv	<ul style="list-style-type: none"> The Analysis Report improperly treats Time Dependent Valuation (“TDV”) power consumption as an annualized metric. TDV power consumption includes full economization, partial economization, and full cooling hours, which all have drastically different power consumption during different times of the year. The Analysis Report creates a metric that assumes energy consumption is the same at any point of the year. In addition, the Analysis Report calculates a linear relation of performance across the year by reverse-engineering this TDV factor and multiplying it by a % factor based off of gained economization hours with increased economizer temperature thresholds from the 2019 Energy Code to the proposed 2022 Energy Code. In other words, the Analysis Report wrongly assumes that power consumption is the most efficient at full economizer temperature threshold and decreases linearly as it reaches the undefined partial economizer temperature threshold. In reality, energy consumption does not fit in a linear model. 	<p>Staff disagrees with comment. TDV is calculated on an annual basis hour by hour and takes into account the different energy consumptions. All proposals are required to be analyzed which Vertiv had completed as well in the same fashion in the original submittal.</p> <p>The linear assumption was made only from the 50degF to 40degF outdoor air.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72901

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239072.011	Vertiv	<ul style="list-style-type: none"> Introducing Substantial Last-Minute Changes Deprive Stakeholders of the Ability to Adequately Review and Respond to the Proposed Language. The Commission's addition of an unsubstantiated NSenCOP table in the 15-day comment period raises significant procedural fairness concerns. This new table imposes significant metrics for compliance with Title 24, and its addition during the 15-day comment period rather than the longer 45-day comment period or still earlier in the process would on its own be concerning. In this case, however, the timeline for review was actually much shorter, as a practical matter. Commission Staff did not provide the underlying methodology for this new table to Vertiv until July 21, 2021—a mere 5 business days before the close of the comment period—and only then after Vertiv directly requested it. To understand the compliance impacts of an addition like this, Vertiv and other stakeholders need to conduct detailed analysis of the NSenCOP values and the underlying methodology and data used to develop it, and because this addition was completely new in the 15-Day Express Terms, stakeholders could not prepare in advance. Such an effort would be challenging within 15 days, but expecting stakeholders like Vertiv to complete fulsome analysis in only two days is unreasonable. Additionally, concerns raised by this NSenCOP table fall only on refrigerant economizer manufacturers; no similar changes were made for other economizer technologies. This is inherently unfair to stakeholders like Vertiv. Making the situation still more challenging, Commission Staff could not promptly answer 	<p>Staff had notified Vertiv weeks before the 45 day language workshop regarding the potential comment. Days later the analysis for the NSenCOP and table values were docketed and no alternative analysis was provided by Vertiv to address the gap in energy efficiency.</p> <p>Allowing Vertiv to be included into the prescriptive standards without the NSenCOP, thus not being equivalent to alternative prescriptive options, would be unfair to the other economizer types.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72503
239072.012	Vertiv	<ul style="list-style-type: none"> The 15-day Express Terms contains multiple unexplained discrepancies and errors. For example, the language references "pumped refrigerant economizers" in certain sections (see Section 140.9(a)(1)(C)) while omitting "pumped" from the discussion of refrigerant economizers in other sections (see Section 141.1(b)(1)(C)). Particularity in describing the regulated technology is important, especially in distinguishing between categories and subcategories of that technology. For example, Vertiv's refrigerant economizer products are unique in that they use a pump, whereas other refrigerant economizer technologies do not. It is crucial that the proposed language make clear which technology is subject to these particular regulations. 	<p>Staff appreciates the comment.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72503
239072.013	Vertiv	<ul style="list-style-type: none"> The proposed prescriptive NSenCOP metrics are not only premature, but they also have the unintended consequence of stifling innovation that could otherwise advance the Commission's efforts in energy efficiency and energy conservation. The 15-day language, as it is written, penalizes Vertiv for developing an innovative, energy-efficient technology that does not face the same drawbacks as other economizer technology, which are dependent on water consumption or clean air. Notably, the prescriptive metrics do not currently account for refrigerant economizers' water savings when compared to waterside economizers. 	<p>Staff's intent is not to punish Vertiv for innovation, but to equalize the energy efficiency among the prescriptive requirements. Staff welcomes Vertiv to provide robust analysis that is in line with the approach for prescriptive requirements.</p> <p>Staff provided Vertiv with a template that includes description of embedded energy savings due to water savings.</p> <p>The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72503

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239072.014	Vertiv	Vertiv acknowledges the Commission's recent and ongoing efforts to address the concerns identified in these comments, including for example the July 26 informal roundtable session with Vertiv and members of the CASE team. As previously discussed with Commission Staff, Vertiv is submitting the above comments to meet the 15-day comment period deadline, but Vertiv also intends to continue participating in the efforts to finalize the proposed language, which Vertiv understands will continue past the close of the 15-day comment period. As such, Vertiv may submit additional and/or updated comments in light of those efforts as they proceed or at their conclusion. Given the ongoing nature of these efforts, Vertiv respectfully requests that the Commission consider any such additional and/or updated comments from Vertiv when they are submitted.	Staff appreciates the comment and is aware of the ongoing discussions. The Commission declined to adopt language regarding pumped refrigerant economizers in the 2022 standards cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239072&DocumentContentId=72503
239073.001	Wattstopper Legrand	Since these terms (Common Living Area, Common Service Area, Common Use Area) are used in the new Multifamily sections of the code, we ask that they be returned with their definitions in Section 100.1 to ensure there is no confusion as to what Multifamily spaces these terms apply to.	The definitions of the terms (Common Living Area, Common Service Area, Common Use Area) are deleted in the adopted language. Staff determined that the usage of the terms in the body of the language is sufficient to provide the meaning to the code users.	7/28/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=2384018&DocumentContentId=739073
239073.001	Charles Knuffke/Wattstopper/Legrand	§100.1 – Definitions Common Living Area Common Service Areas Common Use Areas We see that these three terms have been deleted from the previous 45 day language. Since these terms are used in the new Multifamily sections of the code, we ask that they be returned with their definitions in Section 100.1 to ensure there is no confusion as to what Multifamily spaces these terms apply to.	The definitions of the terms (Common Living Area, Common Service Area, Common Use Area) are deleted from the 15-day Express Terms. The usage of the terms in the body of the language is sufficient to provide the meaning to the code users.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239073&DocumentContentId=72511

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239073.002	Charles Knuffke/Wattstopper/Legr and	<p>§110.12 – Demand Response</p> <p>We remember well the excitement around the 2013 Title 24 because of the significant steps that were taken that year. Plug Load and CL-CATT requirements were added, but what was particularly impactful on the Nonresidential lighting side were a pair of requirements that none of the other major codes had required – Dimming (of LED loads) and Demand Response. Dimming set the foundation for the future, as it represented an “enabling technology” for lighting. Without dimming, daylighting would have had to be done in steps and there would little opportunity for features like Partial Off, High End Trim, and Demand Response. We believe the investment, indeed the risk, the CEC took on in 2013 to require dimming for LED fixtures has paid off more handsomely than anything else ever implemented on the nonresidential lighting requirements, with the additional benefit of increased supply of dimmable LED fixtures for the entire US. California’s actions in Title 24 2013 truly benefited the entire country.</p> <p>We bring this up because Demand Response, the other requirement that we believe qualifies as an enabling technology, is unfortunately losing steam because of technology advances (resulting in lower lighting power densities) but more importantly, changes being made in the code. Granted, Demand Response was included in the 2008 Title 24, but it was limited to only for retail establishments over 50,000 ft2. It was the 2013 Code that put Demand Response on the map since this</p>	<p>The 2013 energy codes were analyzed and reviewed based on previous metrics. These analysis may not apply directly to 2022 metrics. General lighting is identified for two reasons. First, strategies for controlling general lighting is based on section 130.1(b) which pertains to general lighting. Second, it is assumed that lighting power reduction of 15% can be achieved through control of general lighting alone. It should be noted that builders can include other types of lighting in their demand response strategy and this would count to the 15% reduction of lighting power.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239073&DocumentContentId=72511
239073.002	Wattstopper Legrand	<p>130.1(d) - Exceptions 3-5 to Daylighting Section 130.1(d)1</p> <p>We have found it difficult to understand this code language, mainly because it’s not clear if the word “and” is being used to indicate a list of areas in the code or is being used as “added to” in the mathematical sense. Exception 3 states: EXCEPTION 3 to Section 130.1(d): Rooms where the combined total installed wattage of the general lighting in the skylit and primary sidelit zones is less than 120 watts are not required to have daylighting controls for those zones. Rooms where the total installed wattage of the general lighting in the secondary sidelit zones is less than 120 watts are not required to have daylighting controls for that zone.</p> <p>The use of the word “total” in the above paragraph seems to indicate the wattage for any skylit and primary sidelit zones in a space should be added together to see whether that total is more than 120 watts.</p>	<p>The comments were directed to Exception 3,4,5 to §130.1(d) of the 45-day Language.</p> <p>To help designers and code user to understand the requirements, staff added “combined” to the phrase, ‘the combined total installed wattage of general lighting in the skylit and primary sidelit zones’, and revised “in the daylight zones” as “for those zones”.</p> <p>Staff deleted Exception 4 and Exception 5 to Section 130.1(d), which had been rendered outdated by the revised Exception 3 that was added. This change also addressed the concerns as expressed in the comment.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=2384018&DocumentContentId=239073

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239073.003	Charles Knuffke/Wattstopper/Legr and	<p>The reason for background about Demand Response in Title 24 is that we fear the 2022 15 day language further weakens Demand Response at a time where California desperately needs its buildings to be able to respond immediately to demand signals from their grid operators. The new language states:</p> <p>Demand Responsive Lighting Controls. Buildings with nonresidential lighting systems having a total installed lighting power of 4,000 watts or greater that is subject to the requirements of Section 130.1(b), shall install controls that are capable of automatically reducing lighting power in response to a Demand Response Signal.</p> <p>Our understanding of the phrase "subject to the requirements of Section 130.1(b)" would have two effects:</p> <p>1. Section 130.1(b) only pertains to General Lighting, therefore all other interior lighting in the building would be exempt from any demand response requirements.</p>	Other types of lighting are not required to have demand response controls. General lighting is identified for two reasons. First, strategies for controlling general lighting is based on section 130.1(b) which pertains to general lighting. Second, it is assumed that lighting power reduction of 15% can be achieved through control of general lighting alone. It should be noted that builders can include other types of lighting in their demand response strategy and this would count to the 15% reduction of lighting power.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239073&DocumentContentId=72511
239073.004	Charles Knuffke/Wattstopper/Legr and	<p>2. Section 130.1(b) includes an exemption not only for spaces with a lighting power density of .5 W/ft2 but also any space less than 100 ft2.</p> <p>The underlined phrase above, especially when combined with item number 1, will significantly reduce the number of projects constructed that will be Demand Response ready. At a time of great need for the ability to safeguard our electrical grid because of climate change, we fear this is a step backward that we can ill afford.</p>	The reason for this exemption is because installing controls for these small spaces may not be cost effective. These spaces will have minimal lighting fixtures and the savings from demand response may not justify the cost of the controls installed to meet requirements outlined in Section 130.1(b)	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239073&DocumentContentId=72511
239073.005	Charles Knuffke/Wattstopper/Legr and	<p>Edit the above quoted paragraph so instead it reads:</p> <p>Demand Responsive Lighting Controls. Buildings with nonresidential lighting systems having a total installed lighting power of 4,000 watts or greater that is subject to the requirements of Section 130.1(b), shall install controls that are capable of automatically reducing lighting power in response to a Demand Response Signal.</p>	The reference to Section 130.1(b) was kept to decrease the amount of duplicative language in the Energy Code.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239073&DocumentContentId=72511
239073.006	Charles Knuffke/Wattstopper/Legr and	<p>And return an edited version of the previous Exception 1 to 110.12(c) to the code that would state:</p> <p>Spaces with a lighting power density of 0.5 watts per square foot or less are not required to install demand responsive controls and do not count toward the 4,000 watt 10,000 square foot threshold.</p>	An exception for smaller spaces is already included in Section 130.1(b). Therefore no changes were made.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tm=239073&DocumentContentId=72511

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239073.007	Charles Knuffke/Wattstopper/Legr and	<p>§140.10 – PRESCRIPTIVE REQUIREMENTS FOR PHOTOVOLTAIC AND BATTERY STORAGE SYSTEMS</p> <p>After reviewing the language in this code just today, we believe this entire section is not being properly referenced in the 15 day language.</p> <p>In TABLE 100.0-A APPLICATION OF STANDARDS, it appears this Section has been incorrectly called out in the Prescriptive column as 141.10 instead of 140.10.</p> <p>Additionally, in Section 140.2 – Prescriptive Approach, the code states: To comply using the prescriptive approach, a building shall be designed with and shall have constructed and installed systems and components meeting the applicable requirements of Sections 140.3 through 140.9.</p> <p>Note that in the above paragraph Section 140.10 is not included. Our recommendation is that the line be edited to read: To comply using the prescriptive approach, a building shall be designed with and shall have constructed and installed systems and components meeting the applicable requirements of Sections 140.3 through 140.10.</p>	These revisions have been made.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239073&DocumentContentId=72111
239075.001	Statewide Utility Codes and Standards Enhancement Team	<p>Air Distribution</p> <p>The Statewide CASE Team recommends a minor editorial change to Table 140.4-A in Section 140.4(c). The column labeled “All Other Fan Systems >10,000 cfm” should not have footnote 1; this footnote only belongs to the three Multi-zone VAV columns. Footnote 1 in this table refers the reader to the definition of Fan System, Multi-zone VAV in Section 100.1.</p>	Staff appreciates this comment and has fixed this.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.002	Statewide Utility Codes and Standards Enhancement Team	<p>Computer Room Efficiency</p> <p>The Statewide CASE Team recommends changes to Sections 100.1(b), 120.6(j)1, 140.9(a), and 141.1(b) to improve the clarity of code language.</p>	The water economizer definition was revised in Section 100.1(b). As a result, revisions to Section 120.6(j)1, 140.9(a) and 141.1(b) were not deemed necessary.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.003	Statewide Utility Codes and Standards Enhancement Team	In addition, Table 140.9- B should be updated to include “less than or equal to” signs to match ENERGY STAR® language, and Table 141.1-A should be updated to reflect the results of energy analysis using the proposed pumped refrigerant economizer temperature thresholds included in the 15-Day Language in Section 141.1(b). The update to Table 141.1-A is described in a docketed comment letter from the Statewide CASE Team on July 28, 2021.	<p>Staff appreciates this comment and have revised the language.</p> <p>The Commission has declined to adopt language for pumped refrigerant economizer at this time.</p>	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509

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239075.004	Statewide Utility Codes and Standards Enhancement Team	<p>Controlled Environment Horticulture</p> <p>The Statewide CASE Team recommends changes to Section 120.6(h)1 clarify the intent of the dehumidification proposal. Significant ambiguity remains in the 15-Day Language about whether dehumidifiers used for controlled environment horticulture fall within the current scope of covered products. The current definition is too expansive. The Department of Energy has recently opened a standards and test procedure rulemaking on this product which will likely conclude while the 2022 code language is in effect. Removing the line "subject to regulation under federal appliance standards" will provide clarity to industry stakeholders in the face of uncertain regulatory decisions regarding scope of coverage at the federal level.</p> <p>Modifications also removed the repetitive phrase "ng with 10 CFR 430.32(v)2." at the end of this subsection.</p>	Staff determined that the phrase "subject to regulation under federal appliance standards" is an accurate statement that provides clarity regarding the applicability of current federal law, and therefore this language was not omitted from the adopted language. Staff notes that the nonsubstantive typographical error has been corrected.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72508
239075.005	Statewide Utility Codes and Standards Enhancement Team	<p>Nonresidential Reduce Infiltration</p> <p>The Statewide CASE Team recommends changes to Section 140.3(a)9Ciiia and 140.3(a)9Ciiib to improve clarity of the language. The Statewide CASE Team also recommends removing the sectional test method outlined in 140.3(a)9Ciiib and NA5 to remain consistent with ASHRAE 90.1. This language was originally proposed to align with ASHRAE 90.1, but Addendum T, released in April 2021, removed this option. Therefore, the Statewide CASE Team is recommending removing this language to align with ASHRAE 90.1.</p> <p>The Statewide CASE Team also recommends removing NA 5.9 because it is no longer referenced in Section 140.3(a)9Civ.</p>	No changes were made to this section as the language was clear as written. The sectional test method in 140.3(a)9Cib was kept to provide buildings with additional flexibility in testing building air leakage. Staff will review removing NA5.9 in future code update cycles.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.008	Statewide Utility Codes and Standards Enhancement Team	<p>Nonresidential Refrigeration System Opportunities</p> <p>The Statewide CASE Team recommends language changes to Section 120.6(a)9 to clarify the two-step closure process. The proposed language update is additionally beneficial because it aligns with the federal language for walk-in coolers and walk-in freezers. 5</p>	Staff appreciates the comment. Staff understood that automatic door closers are designed to fully closed doors from any open position, as detailed in the CASE Report, by which this meets the two-step process as described. The two step process may add confusion to the Standards requirement when determining compliance and may be better described in the compliance manual. Also, the two-step process as described by the federal language is for doors no larger than 7'x3'9" and explicitly says it does not apply to larger doors. This 2022 Standards requirement applies to refrigerated warehouses which may have larger doors. Staff will work with the CASE team for clarification language in the compliance manual.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509

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239075.009	Statewide Utility Codes and Standards Enhancement Team	<p>Nonresidential Grid Integration</p> <p>The Statewide CASE Team recommends language changes to Section 110.12(c) that attempts to further clarify what portion of a building's lighting is subject to which components of the demand responsive lighting requirement. The three distinct lighting components of Section 110.12(c) are listed below, with the recommended language changes focused on clarifying the requirements for item 3.</p> <p>1. Which lighting counts towards the 4,000-watt threshold? a. Lighting subject to 130.1(b) multi-level lighting, which includes general lighting only among other limitations. 2. Which lighting must be installed with demand responsive capable controls? a. This is the same lighting that is subject to the 4,000-watt threshold. 3. Which lighting counts towards the 15 percent reduction calculation? a. The 15 percent reduction is calculated based on all lighting, not just what needs to have demand responsive controls. For example: a space with 100 watts of lighting subject to items one and two, and 50 watts of additional lighting that is not subject to items one and two. The 15 percent reduction is equivalent 22.5 watts (150 watts x 15 percent) and not 15 watts (100 watts x 15 percent). In practice, this could be achieved by reducing the demand responsive controlled lighting by more than 15</p>	Language in 110.12(c) was revised to clarify the requirements to address these concerns where appropriate.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239075&DocumentContentId=72509
239075.010	Statewide Utility Codes and Standards Enhancement Team	<p>Multifamily Restructuring</p> <p>In the new Sections 160.0 through 180.2, the Statewide CASE Team recommends language changes for terminology clean-up and section reference corrections for a clearer presentation of multifamily requirements. These include, but are not limited to:</p> <ul style="list-style-type: none"> • Inclusion of the terms common use area, dwelling unit, and multifamily, and removing remnants of the terms common living area, common services area, attached dwelling unit, low-rise residential, and high-rise residential. • Section reference corrections in Section 160.3(a), 170.2(e), 180.2(b) • Inclusion of SRI in roof product requirements described in Section 170.2(a)1A • Clarification that exception to Section 160.3(b)5Aiiia can be taken even for multifamily buildings without an attic. <p>The Statewide CASE Team also included the heat pump ready changes to Section 150.0(n)1 in the mark-up for Section 160.4(a), as we believe these should also apply to multifamily buildings.</p>	Thank you for your comment. Staff revised language to address these suggested edits where appropriate.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239075&DocumentContentId=72509

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239075.011	Statewide Utility Codes and Standards Enhancement Team	Multifamily Indoor Air Quality The Statewide CASE Team proposes several minor clarifications including: <ul style="list-style-type: none"> • In Section 160.2(b)2Ci, adding language that the central ventilation duct sealing measure only applies to four or more habitable stories. This is based on communications with the Energy Commission that they intended for central ventilation duct sealing to only apply to high-rise multifamily. • In Section 160.2, deleting "makeup air systems" in the language requiring filtration to reduce confusion. • In Section 160.2, adding the reference to parking garage exhaust requirements in 160.2(c)4. Section 160.2 currently only calls out 120.6 (which is parking garage ventilation rate). • In Section 160.3, moving the sentence "In multifamily buildings with four or more habitable stories" into the introductory paragraph. Currently that language is in every subsection. Moving it to the introduction language results in more succinct language and clarifies that acceptance testing is only required for these measures in high-rise buildings. 	1. Staff agrees that this requirement applies to multifamily with four or more stories. Language can be added to this section for additional clarification. As written, Section 160.2(d) already specifies that the central ventilation duct sealing acceptance test only applies to four or more habitable stories. 2. Staff does not agree with the suggested comment. The filtration requirement is applicable to makeup air systems, if it exist in the dwelling unit. 3. Staff agrees with the edit, though Section 160.2(c)4 is applicable as written. 4. Staff appreciates the comment and will consider this in the 2025 code cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.012	Statewide Utility Codes and Standards Enhancement Team	Single Family The Statewide CASE Team recommends changes to Section 150.0, 150.1, and 150.2. Recommendations to Section 150.0 include minor formatting as well as the two following items: <ul style="list-style-type: none"> • Exception to Section 150.0(a)1: Revised to simplify the language and expand the exception to be inclusive of scenarios where ducts are located outside of an attic but not in conditioned space, such as a crawlspace. Roof deck insulation is cost effective based on reducing duct losses in the attic; therefore, the exception should be extended to other locations. • Section 150.0(m)1B: Revised exception to 150.0(m)1Bi to clarify that buildings without attics can also claim the exception while explicitly not allowing the exception for ducts in an unvented attic. Deleted 150.0(m)1Bii because this language is unnecessary given that the exception to 150.0(m)1Bi already covers the condition where ducts are entirely in conditioned space. In Section 150.1, the recommended changes include minor formatting and an update to Table 150.1-A to reflect that gas heating is allowed in Climate Zone 10 consistent with the Energy Commission's revised 15-Day Express Terms. In Section 150.2, the recommended language changes include adding electric ready requirements for space heating, cooking, and clothes drying for additions (150.2(a)). The 15-Day Language	Thank you for your comments. Exception to Section 150.0(a)1 was modified to address this concern, and expanded to included scenarios where the space conditioning system air handler is located in unconditioned space and has 12 linear feet or less of supply duct are located in unconditioned space, with all other portions of the supply duct located in conditioned space below the ceiling separating occupiable space from the attic. Exception to Section 150.0(m)1Bi was not modified because ducts inside of directly conditioned space would fall under Section 150.0(m)1Bii, and this includes buildings without attics. Further guidance will be added to the compliance manuals to address these concerns. Table 150.1-A was modified to reflect the prescriptive heat pump source change to water heating, and reflect the prescriptive gas space heating requirement, as identified. The electric-ready requirements are only applicable to newly constructed buildings. These were not proposed to apply to additions or alterations to existing buildings.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.013	Statewide Utility Codes and Standards Enhancement Team	150.2(b)1Hi Fix typo "ad" to "and"	Thank you for the comment. Staff will resolve this nonsubstantive change as appropriate.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.014	Statewide Utility Codes and Standards Enhancement Team	150.2(b)1Hiib Grammar: "a" to "an"	Thank you for the comment. Staff will resolve this nonsubstantive change as appropriate.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.015	Statewide Utility Codes and Standards Enhancement Team	150.0(o)1i Punctuation, lower-case "d"	Thank you for the comment. Staff will resolve this nonsubstantive change as appropriate.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509

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239075.016	Statewide Utility Codes and Standards Enhancement Team	150.1(b)3Bvi Capitalize section headings	Thank you for the comment. Staff will resolve this nonsubstantive change as appropriate.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.017	Statewide Utility Codes and Standards Enhancement Team	Table 150.1-A Change CZ10 entry for "If gas, AFUE" from NA to MIN Consistent with 15-Day Language changing Climate Zone 10 heat pump baseline from heating to water heating.	Based on feedback from stakeholders, including this comment, staff determined that it was appropriate to not adopt the change first proposed in 45-day language. Therefore, the adopted language does not include this change, as suggested by this comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.018	Statewide Utility Codes and Standards Enhancement Team	100.1(b) Fix definition of NET SENSIBLE COEFFICIENT OF PERFORMANCE (COP) typo: second instance of "aircooled" should be air-cooled".	Staff appreciates comment and corrected this typo in the adopted language.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.019	Statewide Utility Codes and Standards Enhancement Team	150.0(a) Suggest simplification of Exception that it also include other conditions where ducts are not in attic, including other unconditioned spaces, such as a crawlspace. Cost effectiveness of this measure is based on assumption that ducts are in unconditioned vented attic.	As noted above, in response to this comment, Exception to Section 150.0(a)1 was modified, and expanded to included scenarios where the space conditioning system air handler is located in unconditioned space and has 12 linear feet or less of supply duct are located in unconditioned space, with all other portions of the supply duct located in conditioned space below the ceiling separating occupiable space from the attic.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.020	Statewide Utility Codes and Standards Enhancement Team	150.0(m)1B/160.3(b)5Aii Suggest rewording of Exception language and deleting 2nd option where ducts are tested to be VLLDCS. 2nd option where ducts are tested seems unnecessary and could lead to confusion. Revised language under Exception to 150.0(m)Bi seems to address duct insulation for situations where ducts are in conditioned space. Does not need to be reinstated for situations under 150.0(m)Bii. Also clarify that the exception can be taken for buildings that don't have attics.	Section 150.0(b)Bii is applicable to entire duct systems located in conditioned space as confirmed by field verification. Section 150.0(b)Bi is applicable to duct systems that only have a portion of the ducts located in conditioned space. For this reason, staff determined that no change was necessary in response to this comment. However, staff will consider adding additional clarification can be added in the residential compliance manual.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.021	Statewide Utility Codes and Standards Enhancement Team	EXCEPTION 1 to 180.2(b)2Aii Revise exception language for consistency with other exceptions	Staff appreciates the comment. Staff understands this comment to propose striking out the words "duct sealing" to be consistent with other exceptions. This proposed strikeout would not substantially alter the rights or obligations of stakeholders. However, staff will note this proposed strikeout for future rulemaking proceedings.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.022	Statewide Utility Codes and Standards Enhancement Team	Exceptions to 180.2(b)2Aiii Revise exception language for consistency with other exceptions	Staff appreciates the comment. Staff understands this comment to propose striking out the words "duct sealing" to be consistent with other exceptions. This proposed strikeout would not substantially alter the rights or obligations of stakeholders. However, staff will note this proposed strikeout for future rulemaking proceedings.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.023	Statewide Utility Codes and Standards Enhancement Team	160.2(a)1, 160.2(b), 160.2(b)2, 160.2(b)2Aiv Delete the word "attached" from "attached dwelling units" Multifamily dwelling units are attached by definition. Leaving in "attached" may result in confusion.	Staff did not find this change to be necessary, and did not modify this language.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509

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239075.024	Statewide Utility Codes and Standards Enhancement Team	150.2(b)1Diiall, 150.2(b)1Diib and 150.2(b)1E Remover reference and requirements for "multifamily dwellings" from Section 150.2 Word search "multifamily" in Sections 150.0, 150.1 and 150.2 revealed three location where the term was not removed.	Thank you for the comment. References to multifamily have been removed from the single family sections as described.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.025	Statewide Utility Codes and Standards Enhancement Team	Section 150.0(o)1Gvi Include the sound rating (sones) requirement in the Energy Code to avoid having to reference ASHRAE 62.2 code 15-Day Language did not address comment submitted from 45-Day review. Section 150.0(o)1Gvi indicates "...rated for sound in accordance with Section 7.2 of ASHRAE 62.2" but does not include what the sound rating requirement is. Referencing codes outside of what's adopted by the BSC is problematic for installers and building department staff and recommend including the sound rating in the Energy Code to avoid confusion. FYI, the sound rating requirement is also referred to in Section 150.0(o)2Bii and implies the rating can be found in Section 150.0(o)1Gvi.	Staff appreciates the comment. The Energy Code adopts sections of ASHRAE 62.2 by reference with some of the language incorporated explicitly, usually with amendments. Consistent with the CEC's established prior practice, CEC copied and pasted applicable sections of ASHRAE 62.2 into the residential compliance manual for (free) public use in the adopted language.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.026	Statewide Utility Codes and Standards Enhancement Team	Section 150.0(o)1Kiii Include ASHRAE 62.2 Section 6.4 requirement in the Energy Code to avoid having to reference ASHRAE 62.2 code 15-Day Language did not address comment submitted from 45-Day Language. Section 150.0(o)1Kiii indicates that combustion and solid fuel burning appliance "shall conform to the requirements in ASHRAE 62.2 Section 6.4", but does not include these requirements. Referencing codes outside of what's adopted by the BSC is problematic for installers and building department staff and recommend including the requirements in the Energy Code to avoid confusion	Staff appreciates the comment. The Energy Code adopts sections of ASHRAE 62.2 by reference with some of the language incorporated explicitly, usually with amendments. Consistent with the CEC's established prior practice, CEC copied and pasted applicable sections of ASHRAE 62.2 into the residential compliance manual for (free) public use in the adopted language.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.027	Statewide Utility Codes and Standards Enhancement Team	Exception to Section 160.2(b)2 Add "Section 6.8" to sections of ASHRAE 62.2 not required for compliance The California Mechanical Code has requirements on air inlets that are more stringent and supersede the ASHRAE 62.2 air inlet requirements (Section 6.8). Section 6.8 should be added to the list of sections of ASHRAE 62.2 not required for compliance for clarification.	Staff appreciates and notes the comment. Staff finds that ASHRAE 62.2 Section 6.8 consists of more than one requirement and have very specific criteria for air inlets and ventilation openings. Staff did not find any one section in the California Mechanical Code that would be more stringent than ASHRAE 62.2 Section 6.8 in its entirety. The comment does not specify how or what section(s) of the California Mechanical Code are more stringent than ASHRAE 62.2 Section 6.8. Staff does not have sufficient evidence that the comment proposal requires language revision. No changes were made.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509

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239075.028	Statewide Utility Codes and Standards Enhancement Team	120.1 Table 120.1-A Occupancy types should be rearranged into alphabetical order within each category (eg alphabetical within "Educational Facilities" and alphabetical within "Food and Beverage Service", etc.) Not having Table 120.1-A occupancies within each category in alphabetical order will affect completing prescriptive compliance forms and modeling inputs, and make selection of occupancies cumbersome and time consuming for documentation authors. For consistency, Table 120.1-A should match the format of Table 120.1-B, which is in alphabetical order.	Staff appreciates the comment. Staff determined that changes to Table 120.1-A are not necessary and so no changes were made at this time. Staff will revisit the order of the items in the 2025 code cycle to determine whether rearrangement will be beneficial.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.029	Statewide Utility Codes and Standards Enhancement Team	Exception to 160.3(a)2; 160.6(d); 170.2(e) Remove this exception. This exception brings back the confusion of what spaces this applies to related to the "Common service/use area" definitions that were removed in 15 Day Language. It is unclear what "otherwise lack these provisions" refers to and how the exception would apply.	Staff believes this language is sufficient, and will address this requirement in greater detail in the compliance manual. No changes were made.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.034	Statewide Utility Codes and Standards Enhancement Team	Table 180.2-C Suggest moving table up above subsection a to occur directly after language related to duct insulation	Staff appreciates and notes the comment. While Table 180.2-C could be moved, staff has determined that such a change is unnecessary. However, staff notes that moving Table 180.2-C may provide some benefit and therefore will revisit the matter in the 2025 code cycle.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239075.035	Statewide Utility Codes and Standards Enhancement Team	Table 141.1-A Table values are for a 50F drybulb full economizing temperature rather than the 40F drybulb full economizing temperature included in the code language. Table should be updated with new analysis or deleted. Table values are from a different analysis than code requirements.	Staff appreciates the comment and work the CASE team have provided in regards to Vertiv's proposal. At this time staff have determined to not adopt the proposed language regarding pumped refrigerant economizers due to the limited information on record.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239076.001	Statewide Utility Codes and Standards Enhancement Team	First, we believe that the ESP "Application Requirements" cannot be well described with the single orange dotted line. Application requirements are much better represented by a region since there are many potential ESP requirements for any system size. Many applications, such as big box retail and schools, typically have short duct lengths with little pressure drop. Carrier's graphic shows many orange squares below its orange dotted lines. The line should be considered as the upper limit of ESP requirements. Carrier's suggested upper values for ESP are much higher for CAV and SZ-VAV systems than the reference pressures used to calculate the current fan power limits in both Title 24 and ASHRAE 90.1. The reference values used to calculate the allowed brake horsepower are shown in Figure 3.	Staff appreciates comment and agrees with commenter's assesment regarding the ESP graph provided by Carrier.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509

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239076.002	Statewide Utility Codes and Standards Enhancement Team	Further, we disagree with showing design ESP requirements (the square orange data points on the graphics) against the new proposed levels. Those design requirements were created by designers not working under the proposed code. Further, we believe that many of these selections are for replacement equipment installed in buildings that may have been designed before fan power limits were in code. The values shown in the graphics representing the CASE assumptions apply to new	Staff agrees and has found that the design ESP requirements shown in the graph by Carrier in their comment letter are values based on their designers working under the current code requirements. Staff also was informed by Carrier these ESP requirements are for new construction only. Staff agrees with the CASE team that the primary intent is to influence designers to produce better duct designs which would reduce the ESP requirements claimed by Carrier.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239076.003	Statewide Utility Codes and Standards Enhancement Team	Regardless of the pressures represented by the orange line, we cannot agree with the description of "non-compliant" for products shown below the line. Those products can be used by the designers at or below the pressures shown. They will not be removed from the market. As we note above, application requirements are a region, not a single line. The Carrier products that fall below the orange dotted line will continue to be available for these lower ESP applications. As a result, the Statewide CASE Team disagrees with the assertion that a given percent of Carrier products will become "non compliant" from this measure. Further, the designer may choose to use a lower full-load airflow than the 350 cfm per ton of cooling that assumed in Carrier's analysis. To demonstrate that products will not become "non-compliant" as a result of this measure, the Statewide CASE Team has researched the supply fan performance tables from Carrier's product literature. Table 2 shows fan performance data for the 40-ton nominal capacity Carrier WeatherMaker unit with gas heating, model number 48A2D040. The Statewide CASE Team has included markup on the performance table by shading in dark grey the selections that would comply with the proposal for new construction and shading in light grey the additional choices that would comply for equipment replacement. Carrier has noted in conference calls that the vast majority of its sales are for replacement jobs (i.e., alterations), which would qualify for the additional power allowances. It is true that when	Staff appreciates comment and agrees with commenter's assessment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509
239076.004	Statewide Utility Codes and Standards Enhancement Team	The Statewide CASE Team would like to point out that the underlying static pressure assumptions have been adjusted since the Final CASE Report was docketed in September 2020. Understandably, stakeholders may have had some issues keeping up with the minor adjustments to the proposal over the past several months. Still, we want to correct the graphics to reflect the latest base pressure assumptions. The reference pressures used to calculate the proposed fan power allowances are shown in blue dotted lines in Figure 1 and Figure 2. In nearly all cases, the new assumptions show greater static ESP than used in the CASE Report. The new static pressure values are shown in tabular form against the values in the CASE Report in 3 for clarity. The changes are due to an additional 0.1" w.c. to the MZ VAV base allowance for all airflow ranges, an extra 0.2" w.c. for all categories from the economizer return damper credit, and a reduction of 0.25" w.c. for CAV/SZ-VAV systems greater than 10,000 cfm.	Staff appreciates this comment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239075&DocumentContentId=72509

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239076.005	Statewide Utility Codes and Standards Enhancement Team	<p>In summary, the graphics purporting to show a certain percentage of equipment becoming "non-compliant" due to this measure is misleading for several reasons. First, the application requirements cover a much wider range of ESPs than the graphics indicate. Second, the units themselves can be operated at various airflows, and at lower airflows, much more ESP is available. Finally, though understandable, the graphics show outdated underlying static pressures from the CASE Report proposal.</p> <p>Ultimately, this proposal is not about equipment but instead about driving good building design practice and the need for better duct design. That is why the cost justification in the CASE Report only considered improved duct design and assumed the use of equipment that meets the current fan power limits. We expect the code changes will significantly reduce the need for manufacturers to provide high ESP requirements.</p>	Staff appreciates this comment and agrees with the commenter's assessment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239076&DocumentContentId=72509
239076.006	Statewide Utility Codes and Standards Enhancement Team	<p>Both Carrier7 and AHR18 have stated that the Efficiency Factor (EF) of 1.15 should be reduced to 1.0, the mandatory minimum Fan Efficiency Index (FEI) required in Section 120.10. However, EF and FEI cannot be compared. The mandatory FEI is a direct efficiency requirement that applies to fans at their design pressure and airflow. It was created as a backstop to prevent the use of low-efficiency fans that would meet the Fan Power Budget easily when used in fan systems with low ESPs.</p> <p>The confusion is understandable, as the equations used to calculate the individual fan power allowances are similar to those used in FEI. However, the equations are applied in a very different manner. FEI is applied to a complete fan system, where the total pressure drop of the system is used in the calculation. As system pressure decreases, FEI drives higher efficiency fans. In the tables below, when the EF of 1.15 is applied to the reference pressure drop of each fan power allowance it yields lower individual efficiencies. When they are summed, they do not arrive at a fan efficiency that delivers an FEI of 1.15. Examples of multizone VAV systems with three different airflows are shown below.</p>	Staff appreciates comment and agrees with commenter's assessment.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239076&DocumentContentId=72509
239076.007	Statewide Utility Codes and Standards Enhancement Team	<p>The tables demonstrate three critical points:</p> <ol style="list-style-type: none"> 1. The use of EF = 1.15 does not result in reference fans with an FEI = 1.15. 2. The existing method for calculating the fan brake horsepower allowance yields reference FEI's that significantly exceed 1.0. 3. FEI is only of value to determine the appropriate efficiency level of a fan at a given airflow and pressure. Note that in Table 6, the FEI of the higher brake horsepower fan is higher than the lower-power counterpart because the reference pressures are different. 	Staff appreciates comment and understands commenter's explanation.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239076&DocumentContentId=72509

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239076.008	Statewide Utility Codes and Standards Enhancement Team	There appears to be a misunderstanding regarding which credits are available to users in the proposed 2022 Title 24, Part 6 Fan Power Budget table. In particular, Carrier's and AHRI's recently docketed comments seem to indicate their belief that certain credits in the return/exhaust/relief table will no longer be available. However, the Statewide CASE Team would like to emphasize that these credits will continue to be available to users should this proposal become adopted. The two credits, in particular, are listed below, along with their definition from the 2019 Nonresidential Compliance Manual (2019 CM). 9 The credits have been converted to an equivalent W/cfm value in the 2022 proposal, but the underlying static pressure values are identical to the 2019 version. Therefore, any analysis comparing the 2019 fan power limits to the 2022 proposal should either include or exclude these credits for both the Title 24-2019 baseline and the proposed Title 24- 2022 to create a fair comparison.	Staff appreciates comment and agrees with commenter.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239076&DocumentContentId=72509
239076.009	Statewide Utility Codes and Standards Enhancement Team	The Statewide CASE Team does believe that our choice not to apply these two allowances is appropriate. The allowances are not used in the ASHRAE 90.1 prototypes used by DOE, nor are they included in the standard (baseline) design in the 2019 Title 24 Nonresidential Alternative Calculation Manual. However, it must be understood that if we had applied the values to both cases in our analysis, the results would have been the same since the same credit would have been given in the baseline and the proposed cases	Staff appreciates comment and agrees with commenter.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239076&DocumentContentId=72509
239077.001	Statewide Utility Codes and Standards Enhancement Team	The purpose of this workbook is to allow stakeholders to work with the proposed fan power limit updates for California Title 24 There are three worksheets that the user can work out of, one for each type of fan system (single fan, supply/return fan, or complex fan systems). In each worksheet the user can enter fan system parameters and see how the resulting power allowance for the proposal compares against the two existing options in 90.1-2019 (i.e., the motor nameplate method and the brake horsepower method). Users only need to modify the orange "input" cells.	Staff appreciates this comment and the workbook to give stakeholders the opportunity to better understand this proposal.	7/28/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239077&DocumentContentId=72509

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239078.001	Rupal Choksi	<p>On July 14th , a new set of proposed changes was released (Docket Number:21-BSTD-01, TN#: 238848) with the requirements for the use of stand-alone dehumidifiers, now called "dehumidifiers", altered to the following:</p> <p>A. Dehumidifiers subject to regulation under federal appliance standards tested in accordance with 10 CFR 430.23(z) and Appendix X or X1 to Subpart B of 10 CFR Part 430 as applicable, and complying with 10 CFR 430.32(v)2. ng with 10 CFR 430.32(v)2.</p> <p>Through conversation with individuals close to this decision-making process, it is our understanding this wording revision was implemented to prevent the preemption of federal requirements for dehumidification equipment subject to 10CFR430.</p> <p>We further understand that while 10CFR430 is specifically focused on "Consumer Products" (i.e., products purchased in small quantities by individuals for residential use), the justification to require all units be subject to 10CFR430 is based on the fact that there is no capacity, compressorsize or othersize limit listed in 10CFR430. While we cannot fully dispute this reasoning, this decision creates potential collateral impacts that will negatively affect our product offerings and the energy consumption of the CEH industry.</p> <p>We respectfully request that the CEC and the State of California</p>	<p>Staff finds that the proposed amendments establish an appropriate minimum level of anticipated efficiency for portable dehumidification equipment without either risking federal preemption or allowing for installation of inefficient, unrated equipment. Staff does not find that reverting to the May 6 language would accomplish these goals.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72514
239078.002	Rupal Choksi	<p>Revision of this language to subject all dehumidifiers formerly, stand-alone dehumidifiers, to 10CFR430 has two primary implications that may affect the sale of these units to the California CEH market:</p> <p>1. Dehumidifiers will now be subject to the definitions of "portable" and "whole-home" as defined in 10CFR430. With these definitions are the revised test conditions and efficiency requirements that will negatively impact the selection and installation options of dehumidifiers.</p> <p>"Whole Home" dehumidifiers are essentially units that are ducted. They must meet minimum efficiency listed in 10 CFR 430.32(v)2 at the conditions of 73F/60% and 0.2" external static pressure. This is achievable by most stand-alone dehumidification units in the industry.</p> <p>"Portable" dehumidifiers are essentially unducted units. In the CEH industry, this would describe dehumidifiers hung in the "portable" dehumidifiers are essentially unducted units. In the CEH industry, this would describe dehumidifiers hung in the growing space. They must meet minimum efficiencies listed in 10 CFR 430.32(v)2 that are, for units greater than 50 ppd, higher than whole home units while at the lower dewpoint .</p> <p>At these conditions, many stand-alone dehumidifiers will not be permitted to hang in the grow space.</p>	<p>Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430. Staff finds that this avoids the forced classification of commercial equipment not subject to 10 CFR 430 that is of concern to the commenter.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72514

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239078.003	Rupal Choksi	<p>2. Dehumidifiers, regardless of size, that are subject to 10CFR430, could be considered "residential dehumidifiers". Under pending regulations by CARB (California Air Resources Board)2 , "residential dehumidifiers" must use refrigerants with a GWP (Global Warming Potential) of 750 or less by 1/1/2023. Due to a lack of suitable components and building code updates, it is doubtful that this compliance date would be feasible.</p> <p>If the pending CARB regulation is not altered to allow the compliance date of stand-alone dehumidifiers built for the CEH industry to be pushed back to 1/1/2025, like other air conditioning equipment, there may be a gap where the units cannot be sold into the CEH market.</p>	<p>Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430. Staff finds that there are robust options for portable water-cooled and desiccant-based dehumidifiers, in addition to those listed as complying with 10 CFR 430, and that further options can be made available via the 10-109 process.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72514
239078.004	Rupal Choksi	<p>The impact on California, its electric grid, the environment and the CEH industry's efficiency is straightforward. As it was originally explained to the CASE team developing the CEH regulation, moving away from stand-alone dehumidifiers will push the CEH industry to much less efficient HVAC options for dehumidification.</p> <p>Dehumidification for the CEH market is primarily used during "lights out" period when there is minimal A/C load, but the plants continue to transpire moisture into the air. Without the latent removal capacity of A/C or stand-alone dehumidifiers, cooling with reheat must be used to remove the moisture from the air.</p> <p>Under the CASE modeling requirements, "lights out" conditions were set at 70F and 50%. Quest's stand alone dehumidification products sold into the CEH industry ranges in efficiency at the "lights out" condition from 3.8 to 5.7 pints/kWh. Other manufacturers of stand-alone dehumidifiers provide units comparable to the bottom end of that range.</p> <p>If stand-alone dehumidifiers were banned from sale, the closest alternative would be to use packaged (unitary) air conditioning equipment with hot gas reheat. Information collected from various manufacturers shows this equipment provides dehumidification in the range of 0.7 to 3.9 pint/kWh, with most of the equipment at the equivalent size to a stand-alone</p>	<p>Staff does not find that the proposed amendments would represent a ban on use of stand-alone dehumidifiers. Staff observes that three options are available for portable dehumidification equipment: they can be water cooled, consistent with 140.6(h)1C, they can be desiccant-based, consistent with 140.6(h)1D, or they can be demonstrated to be equivalent in performance to the options available under 140.6(h)1, consistent with Part 1 Section 10-109. Staff does not find that allowing installation of less efficient equipment than these options, as would occur if the language were reverted to the May 6 draft, to be appropriate.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72514
239078.005	Rupal Choksi	<p>MIAQ requests that the requirements for the use of stand-alone from draft regulation sent out for public review on May 6th, 2021 be reinstated. It is our contention that this previous version of the draft regulation:</p> <ol style="list-style-type: none"> 1. Did not differentiate between stand-alone dehumidifiers based on their installation. 2. Did not preempt federal regulation. 3. Allows the most efficient technology available for providing dehumidification to the CEH industries to continue to be used unencumbered. 	<p>Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation. As such, this language avoids preemption and does not make distinctions beyond those already applied by applicable federal laws. Staff anticipates that the options available under 140.6(h)1 and the ability to approve equivalent options under 10-109 will allow for a robust selection of efficient products; allowing less efficient equipment would not be consistent with the effort of adopting minimum efficiency standards.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72514

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239078.006	Rupal Choksi	<p>1. MIAQ contends that a "consumer product" dehumidifier could be easily construed as a "residential dehumidifier".</p> <p>MIAQ respectfully opposes the proposed revisions to the Energy Code that defines Dehumidifiers because 10CFR430 is title "Energy Conservation Program for Consumer Products" and its purpose and scope as defined in §430.1 states: This part... establishes an energy conservation program for consumer products other than automobiles.</p> <p>10CFR430.1 provides the following definition of "consumer products": Consumer product means any article (other than an automobile, as defined in Section 501(1) of the Motor Vehicle Information and Cost Savings Act): (1) Of a type— (i) Which in operation consumes, or is designed to consume, energy or, with respect to showerheads, faucets, water closets, and urinals, water; and (ii) Which, to any significant extent, is distributed in commerce for personal use or consumption by individuals; (2) Without regard to whether such article of such type is in fact distributed in commerce for personal use or consumption by an individual, except that such term includes fluorescent lamp ballasts, general service fluorescent lamps, incandescent reflector lamps, showerheads, faucets, water closets, and urinals distributed in commerce for personal or commercial use or consumption.</p> <p>Under this definition, it has always been the understanding of</p>	<p>Staff notes that the criteria for the definition of "consumer product" includes that a potentially covered product "is distributed in commerce for personal use or consumption by individuals". This differs slightly from the commenter's understanding in that it is not dependent on how a device is designed or built, but who it is marketed to or sold to - a device that is built for commercial or industrial applications but nonetheless becomes popular among individual consumers can be found by US DOE to meet the definition of "consumer product" irrespective of the intent of the product's design.</p> <p>Thus, while the commenter is correct that their commercial products would likely not be subject to 10 CFR 430, staff observes that US DOE can determine that a given commercial or industrial product has triggered consumer product requirements should they find that there is marketing towards individuals (indicating that it is being distributed in commerce expressly for this purpose) or significant purchase or use by individuals (even in the absence of manufacturer or seller intent). Staff is not able to make specific findings regarding the federal disposition towards these products; staff understands the general intent of the comment to be requesting that the proposed amendments do not intentionally or inadvertently cause products that would not otherwise be considered consumer products to be subject to federal consumer product requirements. Staff finds that the edits to this language in the revised Express Terms avoids this concern.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72514
239078.007	Rupal Choksi	<p>2. MIAQ contends the draft regulation as proposed in the public review of May 6th, 2021 does not preempt federal regulation</p> <p>MIAQ respectfully contends that our larger stand-alone dehumidifiers do not fall under the regulation of any energy efficiency regulation promulgated by the Department of Energy, any other federal agency, building code or ANSI accredited standard (e.g., ASHRAE Standard 90.1). Based on this, it would be impossible to preempt federal regulation as no regulation exists.</p> <p>Precedence for this understanding has been set by the 2019 Denver Amendments to the 2018 Edition of the International Energy Conservation Code, Chapter 4: C403.13.1 Dehumidification: C403.13.1 Dehumidification. All indoor plant grow operations that require dehumidification shall utilize one of the following dehumidification options: 1. Free-standing dehumidification units with a minimum energy factor of 1.9 l/kWh. The test method for minimum energy factor shall be as specified in 10 CFR Part 430, Subpart B - Appendix X. 2. Chilled water system with heat recovery from the condenser coil to achieve dehumidification reheat. 3. Integrated HVAC system with heat recovery from the condenser coil (hot gasreheat) to achieve dehumidification reheat.</p> <p>This regulation was the basis for wording originally drafted by the CASE CEH draft team and modified to meet DOE Appendix</p>	<p>Staff finds that the description of the starting point in the code change proposal is accurate - the 2018 IECC amendments did serve as a general template for the proposal to amend California law. Staff's proposal reflects this starting point as further refined by public comment received during the pre-rulemaking and rulemaking periods.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72514

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239078.008	Rupal Choksi	<p>If the CEC and the State of California will not agree to return to the original language found in the May 6th version of the draft regulation, MIAQ then asks they consider the following suggested revision to the current language found in Title 24 Section 120.6 (h) 1.A: Dehumidifiers subject to regulation under federal appliance standards tested in accordance with 10 CFR 430.23(z) and Appendix X or X1 to Subpart B of 10 CFR Part 430 as applicable and complying with 10 CFR 430.32(v)2.ng with 10 CFR 430.32(v)2, or non-consumer productde humidifiers that meet the same performance requirements as those dehumidifiers subject to 10 CFR 430.23(z).</p> <p>The intention with this revision of the draft regulatory language is to allow stand-alone dehumidifiers that are constructed for the commercial, industrial, and agricultural markets to be used in California CEH facilities without subjecting them to 10CF430 and any unintended consequences that may entail. Of course, this will still require stand-alone dehumidifiers to be subject to the "portable" and "whole-home" categories and their compliance conditions, which will result in an overall reduction of units available to the CEH market.</p>	<p>Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72114
239079.001	Hawthorne Gardening Company	<p>On July 14th, a new set of proposed changes was released (Docket Number:21-BSTD-01, TN#: 238848) with the requirements for the use of stand-alone dehumidifiers, now called "dehumidifiers", altered to the following: A. Dehumidifiers subject to regulation under federal appliance standards tested in accordance with 10 CFR 430.23(z) and Appendix X or X1 to Subpart B of 10 CFR Part 430 as applicable, and complying with 10 CFR 430.32(v)2.ng with 10 CFR 430.32(v)2.</p> <p>It is our understanding this wording revision was implemented to prevent the preemption of federal requirements for dehumidification equipment subject to 10CFR430.</p> <p>We further understand that while 10CFR430 is specifically focused on "Consumer Products" (i.e. products purchased in small quantities by individuals for residential use), the justification to require all units be subject to 10CFR430 is based on the fact that there is no capacity, compressor size or other size limit listed in 10CFR430. While we cannot fully dispute this reasoning, this decision creates potential collateral impacts that will negatively affect our product offerings and the energy consumption of the CEH industry.</p> <p>Hawthorne Gardening Company respectfully urges that the CEC and the State of California reconsider this revision and return the language to the wording in the May 6th release.</p>	<p>Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430.</p> <p>Staff additionally notes that the criteria for the definition of "consumer product" includes that a potentially covered product "is distributed in commerce for personal use or consumption by individuals". Thus, while the commenter is correct that there is not an upper limit relating to dehumidifier size, there is a criteria used by US DOE to distinguish consumer products from commercial and industrial equipment.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239078&DocumentContentId=72113

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239079.002	Hawthorne Gardening Company	<p>1. Dehumidifiers will now be defined as either "portable" or "whole-home" as defined in 10CFR430. These narrow categories and associated testing requirements will negatively impact the industry by narrowing scope of qualifying dehumidification equipment.</p> <p>"Portable" units may be defined as unducted units. As it relates to the CEH industry portable units are most commonly hung in the growing space. These units are subject to minimum efficacy standards listed in 10 CFR 430.32(v)2, under many conditions they are held to higher efficacy standards than whole home units and as a result many previously compliant units will no longer be compliant to hang in a grow space.</p> <p>"Whole Home" units may be defined as ducted units. These units are subject to testing standards listed in 10 CFR 430.32(v)2, these standards are achievable by most units across the CEH dehumidification industry.</p>	Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430 (and not potentially create the narrowing of product availability that the commenter is concerned for). Staff finds that the option to use portable dehumidifiers that comply with 10 CFR 430 along with portable water-cooled dehumidifiers and portable dessicant dehumidifiers preserves a robust selection of options for builders.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239079&DocumentContentId=72513
239079.003	Hawthorne Gardening Company	<p>2. All dehumidifiers that are subject to 10CFR430, regardless of size or application could be considered "residential". Under pending CARB (California Air Resources Board) all "residential dehumidifiers" must use refrigerants with a GWP (Global Warming Potential) of 750 or less by 2023. Compliance by this date is unlikely due to required component changes and associated supply chain risks.</p> <p>If CARB regulations are not altered to enforce compliance by 1/1/2025 like with other air condition equipment, there will be an extreme supply chain constraint on the industry and there will likely be a period where units cannot be sold into the CEH market.</p> <p>If stand-alone dehumidifiers were banned from sale, the closest alternative would be less efficient unitary air conditioning equipment with hot gas reheat. These units have been shown to be significantly less efficient than standalone units.</p>	Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430. Staff finds that there are robust options for portable water-cooled and dessicant-based dehumidifiers, in addition to those listed as complying with 10 CFR 430, and that further options can be made available via the 10-109 process.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239079&DocumentContentId=72513
239079.004	Hawthorne Gardening Company	<p>Hawthorne Gardening Company requests that requirements for the use of stand-alone from the draft regulation sent out for public review on 6 May, 2021 be reinstated for the following reasons.</p> <ol style="list-style-type: none"> 1. The previous draft did not differentiate between stand alone and whole home (or "whole facility") units based on their installation. 2. Allows flexibility for the grower to use the optimal solution for their facility layout and design. 3. Previous draft did not preempt federal regulations. 	Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation. As such, this language accomplishes the three goals specified by the commenter: it avoids preemption, allows flexibility for commercial and industrial equipment in a manner that preserves a minimum level of efficiency, and does not make distinctions beyond those already applied by applicable federal laws.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239079&DocumentContentId=72513

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239079.005	Hawthorne Gardening Company	<p>By making all dehumidifiers subject to 10 CFR 430, standalone units may be misconstrued as residential units which potentially would force compliance by January 2023, a premature date that vendors and growers will largely fail to meet (due to CARB<750 refrigerant use).</p> <p>It has always been the consensus of our brands and customers that the larger CEH dehumidification units were not subject to regulation as "residential" units and as such, these units should not be subject to CARB residential unit compliance date of January 1st, 2023.</p> <p>Hawthorne does not believe that the previous draft regulations (circulated for public review May 6, 2021) preempted federal regulation.</p> <p>We contend that the standalone dehumidifiers distributed and sold by Hawthorne Gardening company do not fall under the regulations of DOE (Dept. of Energy) or any other federal agency, building code or other ANSI accredited standard. As no regulations exist governing these units there is no precedent for federal regulation.</p>	<p>Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430. Staff additionally finds that while the federal definition of consumer products is open ended, in that manufacturers can test and certify equipment under a presumption that a potentially significant quantity may be purchased by individuals for personal use despite nominally being designed or sold as a commercial product, the prior wording of the provisions could have been read as requiring manufacturers to certify equipment that was not a covered product to a federal program that expressly applies only to covered products. The revised wording fully avoids the observed risk, noting that manufacturers may still certify their nominally commercial equipment to this program (noting that there are significant numbers of individuals within California that engage in some level of CEH for personal benefit).</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239079&DocumentContentId=72513
239079.006	Hawthorne Gardening Company	<p>The precedent that has instead been used was set by the 2019 Denver Amendments to the 2018 Edition of the International Energy Conservation Code, Chapter 4: C403.13.1 Dehumidification:</p> <p>C403.13.1 Dehumidification. All indoor plant grow operations that require dehumidification shall utilize one of the following dehumidification options</p> <ol style="list-style-type: none"> 1. Free-standing dehumidification units with a minimum energy factor of 1.9 l/kWh. The test method for minimum energy factor shall be as specified in 10 CFR Part 430, Subpart B - Appendix X. 2. Chilled water system with heat recovery from the condenser coil to achieve dehumidification reheat. 3. Integrated HVAC system with heat recovery from the condenser coil (hot gas reheat) to achieve dehumidification reheat. <p>This was the regulation that the CASE team used as the basis for the previously written drafts and that was reviewed - and generally supported - by stakeholders during the 12 month public review process.</p> <p>It has been the widely accepted view of the dehumidifier industry that the Denver code does not preempt federal regulation, but rather requires adherence to the performance requirements of 10CFR430. Since there is no other regulation covering non-consumer and non-residential dehumidifiers, it has been considered valid precedent.</p>	<p>Staff finds that the description of the starting point in the code change proposal is accurate - the 2018 IECC amendments did serve as a general template for the proposal to amend California law. Staff's proposal reflects this starting point as further refined by public comment received during the pre-rulemaking and rulemaking periods.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239079&DocumentContentId=72513

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239079.007	Hawthorne Gardening Company	Hawthorne believes that if the CEC and State of California will not agree to return the the language found in the May 6th version of the draft regulation, then we ask that they consider the following revisions to the current language found in Title 24 Section 120.6(h)1.A: Dehumidifiers subject to regulation under federal appliance standards tested in accordance with 10 CFR 430.23(z) and Appendix X or X1 to Subpart B of 10 CFR Part 430 as applicable and complying with 10 CFR 430.32(v)2.ng with 10 CFR 430.32(v)2, or non-consumer product dehumidifiers that meet the same performance requirements as those dehumidifiers subject to 10 CFR 430.23(z). The intention of these revisions is to allow the use of standalone dehumidifiers designed for commercial, industrial and agricultural applications in California CEH facilities and not make them subject to 10CF430.	Staff finds that while the proposed amendments in the revised Express Terms differs from the language in the May 6th version, these amendments limit the scope of the requirement to dehumidifiers that are subject to federal regulation consistent with the commenter's request that equipment outside of the scope of 10 CFR 430 not be made subject to 10 CFR 430. The regulations provide three additional options for dehumidification equipment: they can be water cooled, consistent with 140.6(h)1C, they can be dessicant-based, consistent with 140.6(h)1D, or they can be demonstrated to be equivalent in performance to the options available under 140.6(h)1, consistent with Part 1 Section 10-109. Staff does not find that the unrestricted ability to install unrated equipment as would occur under the May 6 language to be appropriate.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239079&DocumentContentId=72513
239083.001	Mountain Electric Company	Ducted systems are a waste of energy ... We now only install "Ductless" systems like Daikin.	Staff appreciates and notes the comment. The comment is not directly related to the 2022 Standards rulemaking.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239083&DocumentContentId=72520
239087.001	ebm-apst Inc,	ebm-papst has been cataloging wire-to-air fan performance since long before the European ecodesign directive for fans has taken effect on 1/1/2013. With our FanScout fan selector we are giving designers and OEMs electrical power consumption information that they need for energy-conscious fan selections on a life-cycle basis. Once ASHRAE 90.1 and IECC implemented FEI, ebm-papst Inc. proceeded to have RadiPac plenum fans AMCA-certified because those are sometimes applied standalone in buildings. ebm-papst Inc. applauds that also Title 24-2022 implements FEI now.	Staff appreciates supportive comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239087&DocumentContentId=72526
239088.001	AMCA International	AMCA commends the path California is taking to require third-party-verified FEI ratings that could be provided using manufacturer software. FEI ratings most often are provided by manufacturer software because of the myriad fan/motor/drive combinations. Hyperlinks to AMCA-certified software from a wide variety of manufacturers can be found at www.amca.org/find-FEI .	Staff appreciates comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239088&DocumentContentId=72525
239088.002	AMCA International	With the language found in the 15-Day Express Terms 2022 Energy Code, California is on track to become the first state to use FEI in a state energy code that does not reference a model code. This required considerable research by the CASE team, as published in the September 2020 final report Air Distribution: High Performance Ducts and Fan Systems.	Staff appreciates comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239088&DocumentContentId=72525

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239089.001	The Greenheck Group	<p>Greenheck supports CEC's recommendation regarding the Fan Energy Index (FEI). The CEC T24 proposal related to FEI is uniquely applicable to fans for several reasons.</p> <p>1. FEI is easy to understand – FEI has a universal meaning across multiple fan types and has a universal meaning at any fan power. For example, at a given duty point, a fan with an FEI of 1.0 will consume 50% more power than a fan with an FEI of 1.5 (1.5/1.0=1). This holds true for a 1kW fan, a 5kW fan, a 100kW fan and so on. The same is true regardless of fan type (axial fan, centrifugal fan, power roof ventilator, or some other type of fan). FEI will be easy for the market to understand and apply to virtually any fan application.</p>	Staff appreciates the supportive comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239089&DocumentContentId=72524
239089.002	The Greenheck Group	<p>2. FEI is applicable to energy standards and codes – FEI lends itself to use in energy standards such as ASHRAE 90.1, national energy codes such as IECC, and state energy codes such as CEC Title 24. ASHRAE 90.1-2019 includes fan FEI requirements as does IECC and several other state and stretch codes (e.g. IgCC/ASHRAE 189.1). The adoption of FEI in CEC T24 will add rigor to building standards and code requirements targeted at reducing fan energy consumption.</p>	Staff appreciates the supportive comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239089&DocumentContentId=72524
239089.003	The Greenheck Group	<p>3. FEI leverages natural market dynamics – FEI will reinforce the commercial building construction process to reduce fan energy consumption. When designing a ventilation system for a commercial building, the simplicity of FEI will allow consumers (i.e. building owners, contractors, and engineers) to be more informed about the energy consumption for their specific fan application. A more informed consumer will make better fan selections. For example, FEI will provide specifying engineers an easy to understand single number reference to limit the power consumption for any given fan duty point. By including the fan FEI on the building equipment schedule engineers will establish a minimum baseline for fan power consumption. Owners and engineers can establish an FEI to meet minimum regulatory and code requirements, or they can increase the FEI based on tradeoffs between first cost, lifetime building operation costs, carbon reduction goals, et al. Based on the building design FEI requirements established by the owner and engineer, contractors will be compelled to only supply fans that meet the minimum FEI specified by the owner/engineer. In this way, FEI will ensure a level playing field during the bid process for the building.</p> <p>From a regulatory perspective, FEI will make it easy for code officials to verify compliance to local, state and national codes during plan review and during final commissioning. During plan review, requiring FEI on engineering design documents will allow code officials to easily verify that the FEI for a given fan meets minimum code and regulatory requirements. During the building</p>	Staff appreciates the supportive comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239089&DocumentContentId=72524
239089.004	The Greenheck Group	<p>4. FEI is applicable to utility incentive programs – The simplicity of FEI will provide the market with a single number methodology easily applied to incentive programs that promote “above code” fan energy limits. Seattle City Light and other utilities are already offering incentives to use fans that exceed local code FEI requirements.</p>	Staff appreciates the supportive comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239089&DocumentContentId=72524

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239089.005	The Greenheck Group	Greenheck supports CEC requirements for third-party performance verification of FEI The Air Movement and Control Association International (AMCA) has a history of working with manufacturers and regulatory bodies to adapt their standards and certification programs to help ensure regulations are practical and achieve the desired results in the market. To ensure FEI will maximize energy savings related to fans, we support third-party FEI performance verification that is consistent with the rigor of AMCA's Certified Rating Program(CRP) for FEI.	Staff appreciates the supportive comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239089&DocumentContentId=72524
239089.006	The Greenheck Group	Greenheck supports differentiation for fans embedded in HVAC equipment Greenheck recommends CEC implement FEI requirements consistent with requirements and limitations in ASHRAE 90.1-2019. Greenheck recommends fans embedded in equipment with capabilities related to: <ul style="list-style-type: none"> • cooling, • heating, • humidification, • dehumidification, • air cleaning and/or • air purification be differentiated from fans with single functionality to move air.	Staff appreciates the comment and have aligned with ASHRAE on the FEI requirements.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239089&DocumentContentId=72524
239089.007	The Greenheck Group	Concluding Remarks Greenheck very much appreciates the opportunity to comment and contribute to the CEC T24 development process. In summary: 1. Greenheck is supportive of the CEC effort to reduce fan energy consumption through the use of FEI. 2. Greenheck supports requirements for third-party performance verification of FEI consistent with the AMCA Certified Ratings Program. 3. Greenheck supports utilizing FEI consistent with requirements in ASHRAE 90.1-2019.	Staff appreciates the supportive comment.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239089&DocumentContentId=72524

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239091.001	Miki Y	<p>I am a Bay Area resident and a student at The Nueva School. On behalf of my community, I express our strong support for these reach codes to move forward quickly, requiring all-electric new construction for homes and buildings and curtailing the number of exemptions granted.</p> <p>As Governor Gavin Newsom addressed on July 23, 2021, the state of the climate in California is nothing less but an emergency. The drought we experience in California will only get progressively worse, which will interfere with local wildlife, ecosystems patterns, and human activities. For example, the Folsom Lake Reservoir is an example of climate change at play. The Folsom Lake Reservoir is only at 26% capacity, which is already showing catastrophic effects near the area. Wildfires are destroying neighborhoods in seconds, leaving families and communities devastated and wildlife forced to move closer to human developments. For both people and animals alike, the smokey air affects all living things and will lead to long-term respiratory and health problems. My community finds it difficult to live in the inconsistency of California's ecosystems constantly altering due to climate change, specifically the scarcity of water becoming worse and worse. I am urging the importance of doing anything we can to address and tackle the climate crisis by going all electric and addressing climate change more vigorously.</p> <p>I urge the California Energy Commission to lead California</p>	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239091&DocumentContentId=72523
239091.001	Miki Y	<p>I am a Bay Area resident and a student at The Nueva School. On behalf of my community, I express our strong support for these reach codes to move forward quickly, requiring all-electric new construction for homes and buildings and curtailing the number of exemptions granted.</p> <p>As Governor Gavin Newsom addressed on July 23, 2021, the state of the climate in California is nothing less but an emergency. The drought we experience in California will only get progressively worse, which will interfere with local wildlife, ecosystems patterns, and human activities. For example, the Folsom Lake Reservoir is an example of climate change at play. The Folsom Lake Reservoir is only at 26% capacity, which is already showing catastrophic effects near the area. Wildfires are destroying neighborhoods in seconds, leaving families and communities devastated and wildlife forced to move closer to human developments. For both people and animals alike, the smokey air affects all living things and will lead to long-term respiratory and health problems. My community finds it difficult to live in the inconsistency of California's ecosystems constantly altering due to climate change, specifically the scarcity of water becoming worse and worse. I am urging the importance of doing anything we can to address and tackle the climate crisis by going all electric and addressing climate change more vigorously.</p> <p>I urge the California Energy Commission to lead California</p>	CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239091&DocumentContentId=72523

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239092.001	Maya Chow	<p>I'm a Bay-Area resident and a student at The Nueva School. On behalf of my community, I express our strong support for these reach codes to move forward quickly, requiring all-electric new construction for homes and buildings and curtailing the number of exemptions granted. As Governor Gavin Newsom addressed on July 23, 2021, the state of the climate in California is an emergency. The severe drought will only continue to get worse affecting local wildlife and reducing play areas for families, such as the Folsom Lake Reservoir. Nearing the end of July, the Folsom Lake Reservoir is only at 26% capacity. Wildfires are destroying neighborhoods in seconds leaving families and communities devastated, and animals without a home. My community's health is affected by wildfire smoke to the point where schools have been closed and outdoor recreational sports have been shut down. Animals having to evacuate their homes due to the wildfires seek shelter in residential communities eating pets and decorative vegetation. My community finds it difficult to live with wildlife constantly altering the ecosystem which is why I'm urging the importance of doing anything we can to address and tackle the climate crisis by going all electric and addressing climate change more vigorously.</p> <p>I urge the California Energy Commission to lead California towards a better path by going all electric.</p>	<p>CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239092&DocumentContentId=72528
239092.001	Maya Chow	<p>I'm a Bay-Area resident and a student at The Nueva School. On behalf of my community, I express our strong support for these reach codes to move forward quickly, requiring all-electric new construction for homes and buildings and curtailing the number of exemptions granted. As Governor Gavin Newsom addressed on July 23, 2021, the state of the climate in California is an emergency. The severe drought will only continue to get worse affecting local wildlife and reducing play areas for families, such as the Folsom Lake Reservoir. Nearing the end of July, the Folsom Lake Reservoir is only at 26% capacity. Wildfires are destroying neighborhoods in seconds leaving families and communities devastated, and animals without a home. My community's health is affected by wildfire smoke to the point where schools have been closed and outdoor recreational sports have been shut down. Animals having to evacuate their homes due to the wildfires seek shelter in residential communities eating pets and decorative vegetation. My community finds it difficult to live with wildlife constantly altering the ecosystem which is why I'm urging the importance of doing anything we can to address and tackle the climate crisis by going all electric and addressing climate change more vigorously.</p> <p>I urge the California Energy Commission to lead California towards a better path by going all electric.</p>	<p>CEC staff has determined that the adopted standards are the best approach to achieve the State's long term decarbonization goals by ensuring the market is able to smoothly transition to statewide use of heat pump technologies while avoiding risks of significant market shortages and disruptions.</p>	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?fn=239092&DocumentContentId=72528

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239094.001	Mountain Electric Company	<p>Less than 10% of HVAC change-out jobs in California are permitted. Even fewer get the required HERS testing performed. Said differently, hundreds of thousands of HVAC change-outs occur each year that do not legally comply with California Building Code.</p> <p>With all of the new requirements of Title 24 energy efficiencies will be wasted, in residential change outs because of no inspections !</p>	Staff appreciates and notes the comment. The comment is not directly related to the 2022 Standards rulemaking.	7/29/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239094&DocumentContentId=72531
239101.001	Muhammad Chandasir	Table 120.6-B: A note should be added clarifying that this table is not applicable to CO2. That table 120.6-C should be used for CO2	Table 120.6-B, as referenced by Section 120.6(a)4, does not apply to Transcritical CO2 systems per the exception. Staff recommends no change.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239101&DocumentContentId=72542
239101.002	Muhammad Chandasir	<p>Commented [NJ2]: A firm number like this does not work for CO2. Please see my comment at 120.6(a)8G</p> <p>Deleted: minimum condensing temperature of 60°F or less...</p> <p>Deleted: EXCEPTION to Section 120.6(a)5B: Compressors with a design saturated suction temperature greater than or equal to 30°F shall be designed to operate at a minimum condensing temperature of 70°F or less....</p>	Staff worked with the CASE author and finds that no code change is necessary. For applications intended for the Mandatory requirements to cover (Coolers and Freezers), CO2 compressors can operate with a minimum condensing temperature of 60°F or 70°F when the saturated suction temperature >= 30°F. Other applications, such as air conditioning using the CO2 refrigeration system are not common in industry at this time (especially refrigerated warehouses), and would be unclear if there is any energy benefit to include air conditioning on a system refrigeration system primarily design for coolers and freezers. Alternative design options would exist such as a secondary fluid (eg. Glycol) to air conditioning equipment if there is a desire to include the load on the refrigeration system.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239101&DocumentContentId=72542
239101.003	Muhammad Chandasir	Note: temperature differences are properly shown as degrees Rankine (°R) [or Kelvin (°K) for SI units]. If differences are shown in many places in the document as °F and an overall correction to °R is not made then it could be used here for consistency.	Staff finds that this is accurate with the temperature expressed as fahrenheit and consistent with the rest of the Standards. Either way, temperature differences expressed in fahrenheit are equivalent to those expressed in rankine.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239101&DocumentContentId=72542
239101.004	Muhammad Chandasir	Dry operation of an adiabatic gas cooler at design conditions is not relevant as it would only occur in an emergency situation. The adiabatic gas cooler should be designed to provide leaving gas cooler temperatures of 15°R or less over the ambient wet bulb temperature. In practice the air has a wet bulb temperature as it enters the wet adiabatic pad, the air is cooled to within some amount of temperature difference from that wet bulb temperature based on the pad efficiency. That pre-cooled air then enters the heat exchanger and the gas leaving the heat exchanger will be at a temperature some amount above the pre-cooled air temperature. We believe a total of 15°R or less is achievable but the amount should be confirmed by various adiabatic gas cooler manufacturers. This temperature difference should also be determined with consideration to the information in Table 120.6-C as a close approach temperature will result in increase fan power for the same Btuh load.	Staff worked with the CASE authors and finds that no code change is necessary. Adiabatic gas cooler sizing based on the dry operation is consistent with the approach used by the Standards for condensers in 120.6(a)4G. Stakeholders have provided feedback as part of the 2019 code cycle when Adiabatic condensers were added, along with the 2022 code cycle where adiabatic gas coolers are added. Commenter mentioned that 15°F sizing to be verified with manufactures which was done as part of CASE work and part of simulation work. The code language sets a conversative limit on gas cooler performance and generally matches standard practice for designers therefore does not exclude many units.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239101&DocumentContentId=72542

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239101.005	Muhammad Chandasir	A flat number like 60°F or 70°F does not work correctly for all conditions. The pressure differential at the compressor (suction pressure to discharge pressure) is what matters. It is true that for a typical food application with a +20°F Saturated Suction Temperature (SST) the 60°F would work, but that is not true at all SST's. Example: At +45°F suction temperature (A/C) the lowest acceptable condensing temperature for proper compressor operation is 76°F. Also, it should be noted that the use of the term "intermediate" is probably incorrect here. The intermediate pressure is the pressure in the flash tank and that is only related to minimum condensing temperature when parallel compression is applied to the system and the flash tank pressure is the suction pressure of the compressor connected directly to the flash tank. For systems without parallel compression what it important is the suction pressure of the transcritical compressors which is usually the "Medium Temperature" suction group that is at the highest temperature. That MT group could be food at +20°F, but there may be an additional suction group for air conditioning or a process suction group at +45°F or higher.	Staff worked with the CASE authors and finds that no code change is necessary. The use of 'saturated' for condensing temperature is not required. Same with 'or equivalent saturated condensing pressure setpoint'. Such can be clarified in the Compliance Manual if not done so already. The language in 8G is consistent with the language in 5A and 5B. The comment brought up scenarios of saturated suction temperatures being higher than 30°F, such as with air conditioning. We are not aware of air conditioning tied to a transcritical CO2 system and unaware of the energy impacts. Until that can be studied in future code cycles, the code will basically disallow the use of air conditioning tied directly to a CO2 system, and instead the Comfort Cooling portions of Title 24 can apply to that equipment vs this Covered Process section. As noted in other similar comment indirect air conditioning cooling with other means such as glycol cooling would be a technologically feasible option if the cooler for air conditioning is to be done with a CO2 refrigeration system. For the exception language, the 'intermediate' term may be an area of confusion, since single stage systems transcritical systems may be use for Cooler only applications.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72142
239101.006	Muhammad Chandasir	Deleted: EXCEPTION to Section 120.6(a)8G: Transcritical CO2 refrigeration systems with a design intermediate saturated suction temperature greater than or equal to 30°F shall have a minimum condensing temperature setpoint of 70°F or less....	Staff worked with the CASE authors and finds that no code change is necessary. The use of 'saturated' for condensing temperature is not required. Same with 'or equivalent saturated condensing pressure setpoint'. Such can be clarified in the Compliance Manual if not done so already. The language in 8G is consistent with the language in 5A and 5B. The comment brought up scenarios of saturated suction temperatures being higher than 30°F, such as with air conditioning. We are not aware of air conditioning tied to a transcritical CO2 system and unaware of the energy impacts. Until that can be studied in future code cycles, the code will basically disallow the use of air conditioning tied directly to a CO2 system, and instead the Comfort Cooling portions of Title 24 can apply to that equipment vs this Covered Process section. As noted in other similar comment indirect air conditioning cooling with other means such as glycol cooling would be a technologically feasible option if the cooler for air conditioning is to be done with a CO2 refrigeration system. For the exception language, the 'intermediate' term may be an area of confusion, since single stage systems transcritical systems may be use for Cooler only applications.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72142
239101.007	Muhammad Chandasir	The rating conditions presented here must be reviewed and commented on by dry type air-cooled gas cooler manufacturers and adiabatic gas cooler manufacturers. The ability of these devices to meet these requirements is unknown to us.	Comment suggests gas cooler manufactures of heat rejection equipment review. The CASE Process engaged the various industry manufacturers at the time and the CASE team received actual performance data from the manufacturers to determining the minimum efficiency requirements.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72142

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239101.008	Muhammad Chandasir	Rating an adiabatic gas cooler during dry mode operation is unrelated to actual operation and could be a very significant cost driver for the selection of this equipment. They will only operate without water in an emergency and at some ambient conditions the system will not operate without water. Perhaps this minimum efficiency should be XX Btuh/watt at 1400psig, 100°F Outlet Gas Temperature, 80°F wet bulb	The comment suggests changing the Adiabatic Dry Mode rating condition to 1400psi to match the outdoor Air-Cooled rating condition. The efficiency rating condition is a chosen set of fixed conditions so equipment performance can be equally compared, and unrelated to applied site conditions. The 1100 psig was chosen based on a common rating condition as provided by manufacturer stakeholders for adiabatic equipment.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72542
239101.009	Muhammad Chandasir	The pressure in an adiabatic gas cooler which is operating without water, "Dry Mode" will be controlled to the same pressure an air-cooled gas cooler is controlled to so for the same leaving gas cooler temperature the controlled to pressure is the same.	The commentor has concerns with using a dry-mode rating for adiabatic condensers. As noted in A, the fixed rating conditions are chosen for consistent for comparing equipment efficiency. Actual operations can and will differ during super critical mode. Sizing of the gas coolers, which is separate from the gas cooler minimum efficiency, is defined in 120.6(a)8B and 120.6(a)8C.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72542
239101.010	Muhammad Chandasir	A note should be added stating this section and Table 120.6-D are not applicable to transcritical CO2 and to use 120.6(b)5	The exception for Transcritical CO2 already exists in the section that references Table 120.6-D. The tables do not repeat the requirements and exceptions.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72542
239101.011	Muhammad Chandasir	Not applicable to transcritical CO2 (referencing Table 120.6-D)	The exception for Transcritical CO2 already exists in the section that references Table 120.6-D. The tables do not repeat the requirements and exceptions.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72542
239101.012	Muhammad Chandasir	See all comments at Table 120.6-C above (referencing Table 120.6-E)	The comment is stating that all previous comments made applies again to this table. Those comments have been responded to above.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=2391018&DocumentContentId=72542
239112.001	Bradford White Corporation	Sections 110.3(c)2 and 110.8(d)2 Unfired service water heater storage tank BWC applauds CEC's recognition of an energy efficiency minimum for unfired hot water storage tanks (UFWHST), and the corresponding edits to Section 150.0(j)1 and Section 160.9(f). Accordingly, we bring to CEC's attention Section 110.3(c)2 of the Energy Code which reference 'unfired service water heater storage tank' and Section 110.8(d)2 which references 'unfired water storage tank.' The aforementioned equipment are actually UFWHSTs, and as such, CEC's mandatory requirement exceeds a federal requirement; in addition, it gives rise to the following questions: <ul style="list-style-type: none"> • What research and analysis did CEC complete to determine that wrapping a UFWHST with R-3.5 insulation is a mandatory requirement • What research and analysis did CEC complete to determine that wrapping a UFWHST with a combined R-value of at least R-16 is a mandatory requirement? • What research and analysis did CEC complete to determine the heat loss of the tank surface based on an 80°F water-air temperature difference shall be less than 6.5 Btu per hour per square foot? 	The 2022 proposed edits updated the external insulation blanket R-value to account for the current DOE standard for internal tank insulation, resulting in a reduction in the historical requirement if only insulation blankets are used to comply. We have thoroughly assessed the legality of the 2022 Energy Code, and have concluded our standards are not preempted.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239112&DocumentContentId=72561

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239112.002	Bradford White Corporation	ANSI/CTA-2045-B requirements BWC notes the 15-day language now includes ANSI/CTA-2045-B requirements for a HPWH in Sections 150.2(a)(1)(D) and 150.2(b) Additions and alterations to existing single-family residential buildings and Section 180.2 Alterations to multifamily buildings. Section 110.12 Mandatory requirements for demand management has no ANSI/CTA-2045-B requirements; similarly, Appendix JA13 Qualification requirements for heat pump water heater demand management systems has no ANSI/CTA-2045-B requirements. We recommend CEC remove ANSI/CTA-2045-B requirements from the 15-day code language as the mandatory requirements for demand responsive controls are outlined in Section 110.12 of the Energy Code. Consistent requirements for demand response controls in the Energy Code are necessary as to not create confusion among utilities, manufacturers, architects, engineers, inspectors, and installers.	Mandatory measures for water heater scenarios in additions and alterations provide an option of meeting 110.12(a) or having a ANSI/CTA-2045-B communication port.	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239112&DocumentContentId=72561
239112.003	Bradford White Corporation	Subchapter 11 Multifamily Buildings – Performance and Prescriptive Compliance Approaches Section 170.2(d) Water Heating Systems CEC has laid out installation requirements in 170.2(d)2, which are overly prescriptive. Due to their increased complexity, it is critical that plumbers and installers receive the necessary training regarding proper sizing, installation, troubleshooting, and maintenance of central HPWHs. We believe CEC had good intentions with the requirements of 170.2(d)2 as HPWHs, especially central HPWHs, are a relatively new technology, and it begs the following questions: • What research and analysis did CEC complete to determine proper installation, proper commissioning, and proper maintenance of the various technology and manufacturer models of central HPWHs? • Has CEC considered references to storage tank be updated to thermal storage, as to not exclude technologies? We recommend that CEC should defer the proper sizing, installation, troubleshooting, and maintenance of central HPWHs as designated by their manufacturer. The overly prescriptive requirements are unnecessarily restrictive and limit improvements in known and unknown technologies. Accordingly, we refer CEC to existing language in the Energy Code, Section 110.3(c)(4)(E) Mandatory requirements for service water-heating systems and equipment, which states, 'Storage	The CHPWH requirements in 170.2 are necessary because these are built-up systems and the performance of these systems are highly dependent on proper design. Performance compliance is always available for system configuration different from the prescriptive requirement	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239112&DocumentContentId=72561

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239112.004	Bradford White Corporation	<p>Joint Appendix JA13 – Qualification Requirements for Heat Pump Water Heater Demand Management Systems</p> <p>Demand management functionality can include the advanced load up function. The system stores extra thermal energy, where some or all the tank may exceed the user’s local setpoint temperature.</p> <ul style="list-style-type: none"> • Has CEC considered that a water heater listed to ASSE 1084 shall be set to deliver a maximum water temperature of 120°F or less, and is intended for point-of-use applications? • Has CEC considered that a water heater listed to ASSE 1082 controls outlet temperature to specific limits and does not regulate the outlet temperature down to a safe temperature like a mixing valve? • Has CEC considered that UL 60730-1, General Requirements for Automatic Electrical Controls, is a safety standard for electrical controls, and not a thermostatic mixing valve or a water heater? UL 60730-1 is a safety standard that water heaters listed to ASSE 1082 and ASSE 1084 shall comply; however, an appliance with a control complying with UL 60730-1 isn’t necessarily a water heater that is compliant with ASSE 1082 or ASSE 1084. 	<p>JA13 is identical to the compliance option approved in 2020. The document was developed with industry consensus over a 18-month development period, during which Bradford White was a participant. Other water heater manufacturers have indicated there is no issue with the current language, and we expect OEMs to produce HPWHs that are safe for consumer use.</p>	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239112&DocumentContentId=72561
239112.005	Bradford White Corporation	<p>Joint Appendix JA14 – Qualification Requirements for Central Heat Pump Water Heater Systems</p> <p>The Energy Policy and Conservation Act (EPCA) amended Public Law 94-163 (42 U.S.C. 6291- 6317, as codified), among other things, which authorizes the Department of Energy (DOE) to regulate the test procedures of a number of consumer products, commercial, and industrial equipment. EPCA states:</p> <ul style="list-style-type: none"> • Section 327 (a) Preemption of Testing and Labeling Requirements (1) Effective on the date of enactment of the National Appliance Energy Conservation Act of 1987, this part supersedes any State regulation insofar as such State regulation provides at any time for the disclosure of information with respect to any measure of energy consumption or water use of any covered product if— <ul style="list-style-type: none"> o (A) such State regulation requires testing or the use of any measure of energy consumption, water use, or energy descriptor in any manner other than that provided under section 323; or o (B) such State regulation requires disclosure of information with respect to the energy use, energy efficiency, or water use of any covered product other than information required under section 324 <p>BWC alerts CEC to the aforementioned legislation as manufacturers of federally regulated products, including HPWHs, are prohibited from providing or publishing testing results to other test points other than those established by DOE.</p>	<p>JA14 is a voluntary reporting of performance data for compliance credit. It is not required to meet either the prescriptive or performance requirements for CHPWH</p>	7/30/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239112&DocumentContentId=72561

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239163.001	AHAM	Subchapters 7 & 10 – Dimming Controls Regarding dimming controls at section 150.0(k)2F and 160.5(a)2F, CEC has modified the code to require lighting in habitable spaces, including but not limited to living rooms, dining rooms, kitchens, and bedrooms, to have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down. Wall-mounted dimmer controls for a range hood should not be required. There is no value to requiring wall-mounted controls for lights in a range hood. This is a cooking area and should be considered a workspace. In addition, only a small portion of the range hood models in the market have dimmer capability.	Staff finds that the language in question does not impose the requirement that is of concern to the commenter. Sections 150.0(k)2F and 160.5(a)2F do not apply to appliance lighting. These are expressly luminaire requirements and do not apply to incidental task lighting provided by non-lighting appliances - the lighting in refrigerators and in ranges is similarly not required by this language to have wall-mounted controls or dimming controls.	8/3/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239163&DocumentContentId=72617
239163.001	Kvein Messner, Association of Home Appliance Manufacturers (AHAM)	Dimming controls at section 150.0(k)2F and 160.5(a)2F. Wall-mounted dimmer controls for a range hood should not be required. CEC has modified the code to require lighting in habitable spaces, including but not limited to living rooms, dining rooms, kitchens, and bedrooms, to have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down. There is no value to requiring wall-mounted controls for lights in a range hood. This is a cooking area and should be considered a workspace.	Staff finds that the language in question does not impose the requirement that is of concern to the commenter. Sections 150.0(k)2F and 160.5(a)2F do not apply to appliance lighting. These are expressly luminaire requirements and do not apply to incidental task lighting provided by non-lighting appliances - the lighting in refrigerators and in ranges is similarly not required by this language to have wall-mounted controls or dimming controls.	8/3/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=2384018&DocumentContentId=739161
239163.002	Kvein Messner, Association of Home Appliance Manufacturers (AHAM)	Moreover, imposing this requirement would deprive consumers, especially consumers who purchase internet-connected range hoods as a disability accommodation, of the utility provided by their smart phone controlled product. Compliance with Americans with Disabilities Act (ADA) Accessibility Guidelines1 (ADAAG), created by the U.S. Access Board and issued by the U.S. Department of Justice to guide enforcement of the ADA, can be readily achieved regardless of the presence of more costly wall-installed controls.	Staff finds that the language in question does not impose the requirement that is of concern to the commenter. Sections 150.0(k)2F and 160.5(a)2F do not apply to appliance lighting. These are expressly luminaire requirements and do not apply to incidental task lighting provided by non-lighting appliances - the lighting in refrigerators and in ranges is similarly not required by this language to have wall-mounted controls or dimming controls.	8/3/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=2384018&DocumentContentId=739161
239163.003	Kvein Messner, Association of Home Appliance Manufacturers (AHAM)	And, while dimming range hood lighting should be a consumer selectable product option based on personal preference and affordability, it should not be required for all range hoods. We recommend that CEC exempt wall-mounted dimmer controls for kitchen exhaust fan lighting in addition to the current exceptions listed for sections 150.0(k)2F and 160.5(a)2F. CEC has provided no cost justification that the increased cost of the dimmable controls is offset by lower energy costs. Only a small portion of the range hood models in the market have dimmer capability.	Staff finds that the language in question does not impose the requirement that is of concern to the commenter. Sections 150.0(k)2F and 160.5(a)2F do not apply to appliance lighting. These are expressly luminaire requirements and do not apply to incidental task lighting provided by non-lighting appliances - the lighting in refrigerators and in ranges is similarly not required by this language to have wall-mounted controls or dimming controls.	8/3/2021	15-Day	https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=2384018&DocumentContentId=739161
239192.001	Knauf Insulation	Knauf Insulation supports the proposed energy code changes and revisions represented in the 15-Day Express Terms 2022 Energy—Residential and Nonresidential (Docket 210-BSTD-01) and we are hopeful that the Energy Commission will provide technical support, compliance manuals and training in a timely manner to support these energy code changes upon their effective date.	We appreciate the comment of support.	8/5/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239192&DocumentContentId=72644

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239192.002	Knauf Insulation	Going forward, for these changes and future energy code updates Knauf Insulation will continue to provide insulation materials that support the state's energy code for all building segments—single family, multifamily, and nonresidential. However, it should be noted that the Energy Commission's continued allowance of trading-off energy features dilutes the purpose of envelope efficiency improvements and steals energy savings and comfort from occupants.	We appreciate the input on the process.	8/5/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239192&DocumentContentId=72644
239202.001	Resource Innovation Institute	The stakeholder engagement in California related to the proposed horticultural standards has been more thorough and extended than we've seen in other states. There has been more time allowed between the code proposals and their effective dates. It seems this resulted in thorough input from the market.	Staff appreciates the comment supporting the adoption process undertaken for the amendments.	8/6/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239202&DocumentContentId=72653
239204.001	Corrin Wilder, Fluence by OSRAM	In my opinion, Kyle Booth and Thao Chau did a very thorough job at inviting public, industry, and legislative feedback in the creation of the new Title 24 1.9 update. They reached out to my organization - LED horticultural fixture manufacturer - multiple times, in addition to asking for introductions to customers (which were provided) and sourcing feedback. I saw multiple other methods of public engagement, including their networking session in the early 2020 year at the IAES conference in San Diego. The targets set are certainly achievable and sound in logic. The timeframe given for code compliance is significant and should give end-users plenty of time to plan ahead for measures to be put in place to achieve new code compliance.	Staff appreciates the comment supporting the adoption process undertaken for the amendments.	8/6/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239204&DocumentContentId=72656
239206.001	Nehmiah Stone	I appreciate the opportunity to comment on the Commission's proposed changes to the California Building Energy Efficiency Standards, which I strongly support. In particular, I would like to express my complete support for the adoption of the proposed multifamily chapters (160, 170, and 180) in Title 24, Part 6. Separating multifamily requirements from those of single-family and commercial buildings is long overdue—it is critical to achieving more effective energy efficiency within the sector. The reasons for this are many.	Thank you for the support.	8/6/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239206&DocumentContentId=72657
239212.001	Michael Siminovitch, California Lighting Technology Center	1.We applaud the removal of the proposed exception to Section 130.2(c)3 for parking lot lighting to avoid installing occupancy-based sensors for certain exterior lighting applications.	The Commission thank CLTC for the support of the parking lot motion sensing controls requirements for parking lot lighting.	8/9/2021	15-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?tn=2384018&DocumentContentId=739212
239212.002	Michael Siminovitch, California Lighting Technology Center	2.The 2013 CASE study report modeled the use of sensors with a 50 foot diameter coverage pattern, which provided a reasonably good coverage in typical parking lot applications. CLTC market assessments and testing results show that there are a substantial number of exterior lighting occupancy sensors available that can provide this coverage (or better) in a cross-section of technology categories (i.e. passive infrared, microwave, LiDAR). Furthermore, at UC Davis there are approximately 5,000 sensors installed and we have not received any complaints associated with the sensors. This adaptive sensor based lighting portfolio has provided >70% savings given the long periods of unoccupied illuminated areas often with highly variable schedules.	The CLTC market assessments and testing result findings can be data and evidence that occupancy sensor products are available in marketplace for meeting the Code requirements of outdoor motion sensing controls for parking lot lighting application. In addition, the installation sites at UC Davis can serve as an example of occupancy sensors being successfully installed for parking lot lighting applications.	8/9/2021	15-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?tn=2384018&DocumentContentId=739212

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239212.003	Michael Siminovitch, California Lighting Technology Center	3.While not universal, a more common issue with exterior lighting occupancy sensors is that the wrong sensor, or sensor accessory such as the Fresnel lens option for PIR sensors, can easily be specified and installed in the field. Depending on the application, this can lead to a less-than-ideal range of detection and complaints. This type of issue is inevitable in the absence of an explicit performance specification for exterior lighting occupancy sensors, which I recommend be developed to help mitigate these issues.	The Commission thank CLTC for the comment and information. The provided information can serve as best practices of choosing and installations of occupancy sensors.	8/9/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=2384018;DocumentContentId=239212
239216.001	Anthony Serres (Signify)	We are disappointed to see the removal of the simplifying option to accept Title 20 products as high luminous efficacy light sources from the 15-day language. We strongly encourage its reinstatement. In their comments, both NEMA and Signify specifically supported the simplification proposed in the 45-day language. It would appear that the CEC is simply taking the path of least resistance, making no decision for improvement and simplification. This perpetuates the burden for the building industry, building inspectors, manufacturers, and ultimately for the consumer.	CEC has removed the most expensive and time-consuming portion of the JA8 test ("lumen maintenance" or lifespan test), simplifying compliance for more types of lighting products. Removing this test while preserving original (2019) scope addresses stakeholder concerns regarding flicker behavior, and maintains stringency with respect to energy savings and performance.	8/10/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=2384018;DocumentContentId=239216
239216.002	Anthony Serres (Signify)	Other comments to the 45-day language expressed concern about negative effects of Title 20 lamps replacing Title 24/JA8 lamps, primarily related to temporal light artifacts. However, any negative ramifications of simplifying Title 24 as proposed in the 45-day language are nonexistent.	Title 24/JA8 requires the light source manufacturers to certify their to-be-certified products for meeting the flicker reduction requirements (related to temporal light artifacts effects). The material effects of requiring to meet Title 20 but not Title 24/JA8 would be not having the product flicker information in the public-accessible database for specifiers and others who may have interest to look up the information or to compare different lamp products as listed in the database. This is a negative ramification of simplifying by replacing the Title 24/JA8 requirements with Title 20 lamp requirements.	8/10/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=2384018;DocumentContentId=239216
239216.003	Anthony Serres (Signify)	The strongest argument for this (and for reinstating the 45-day simplification) is that the sales of Title 20 compliant lamps, which are far higher than the sales of Title 24/JA-8 compliant lamps have not led to a deluge of consumer complaints, or other reports of compromised safety and harmful exposure to poor quality lighting in California.	The two (T20 & T24) are not identical and they serve different markets. The market of Title 20 compliant lamps is primarily for and about existing lamp sockets – in existing homes and buildings - for replacement and other installations. The market of Title 24/JA-8 compliant lamps and luminaires is for and about new construction of homes. The lack of consumer complaints or other reports could be attributed to success of both markets of Title 20 and Title 24/JA8 light source products – code-compliant lamps and luminaires.	8/10/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=2384018;DocumentContentId=239216
239216.004	Anthony Serres (Signify)	The burden imposed by the combination of Title 20 and Title 24 is that manufacturers must maintain two lower-volume product portfolios designed for two different specifications, perform more testing, and perform more certification. The associated higher costs, for no perceptible benefit, will only increase prices for the consumer.	The two programs (T20 & T24) serve different segments - one is for and about appliances (lamps) and the other is for new buildings, additions and alterations of buildings. With the removal of the most expensive and time-consuming of the JA8 test, it is expected that the significant cost of the JA8 test would no longer be there for JA8-compliant products and more competitive-priced products would be available to consumers. Based on the above, the Commission does not accept the comment suggestion.	8/10/2021	15-Day	https://efiling.energy.ca.gov/Efiling/GetFile.aspx?m=2384018;DocumentContentId=239216

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239221.001	SCE	<p>Southern California Edison (SCE) thanks the Commissioners, and the California Energy Commission's (CEC) Building Standards staff for their tremendous work on the 2022 Building Efficiency Standards. SCE is fully supportive of the proposed standards, as they mark an important step in supporting the state's greenhouse gas (GHG) reduction goals and broadening customer choice, as demonstrated by the inclusion of prescriptive heat pump baselines, electric readiness requirements for residential buildings, and expanded solar and battery requirements of non-residential buildings.</p> <p>SCE appreciates the CEC's efforts in taking these measured, incremental steps toward the future goal of an all-electric code. As the state moves toward the 2030 decarbonization target, building electrification adoption needs to rapidly scale to achieve these ambitious energy and environmental goals. SCE looks forward to a 2025 Energy Code that will fully electrify new construction in order to accelerate efforts needed to be on a path to achieve California's 2030 decarbonization target.</p> <p>SCE continues to support an all-electric code to align with the state's carbon neutrality goal that will avoid natural gas emissions and additional spending on natural gas infrastructure that may become stranded before 2045. It is important to have an all-electric code to help ensure that all communities benefit from clean energy and that low-income and vulnerable communities are not disproportionately burdened by fossil-fuel</p>	Staff appreciates the comment of support and look forward to working with SCE on future code cycles.	8/10/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239221&DocumentContentId=72673
239221.001	SCE	<p>Southern California Edison (SCE) thanks the Commissioners, and the California Energy Commission's (CEC) Building Standards staff for their tremendous work on the 2022 Building Efficiency Standards. SCE is fully supportive of the proposed standards, as they mark an important step in supporting the state's greenhouse gas (GHG) reduction goals and broadening customer choice, as demonstrated by the inclusion of prescriptive heat pump baselines, electric readiness requirements for residential buildings, and expanded solar and battery requirements of non-residential buildings.</p> <p>SCE appreciates the CEC's efforts in taking these measured, incremental steps toward the future goal of an all-electric code. As the state moves toward the 2030 decarbonization target, building electrification adoption needs to rapidly scale to achieve these ambitious energy and environmental goals. SCE looks forward to a 2025 Energy Code that will fully electrify new construction in order to accelerate efforts needed to be on a path to achieve California's 2030 decarbonization target.</p> <p>SCE continues to support an all-electric code to align with the state's carbon neutrality goal that will avoid natural gas emissions and additional spending on natural gas infrastructure that may become stranded before 2045. It is important to have an all-electric code to help ensure that all communities benefit from clean energy and that low-income and vulnerable communities are not disproportionately burdened by fossil-fuel</p>	We appreciate the comment of support and look forward to working with SCE on future code cycles.	8/10/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239221&DocumentContentId=72673

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239236.001	American Institute of Architects California	<p>We support the proposed 2022 Energy Code developed by the California Energy Commission which promote building decarbonization through electrification and improved efficiency. These Standards will lower costs, reduce unhealthy pollutants, and help California meet it's stated climate goals.</p> <p>Notable are:</p> <ul style="list-style-type: none"> • A performance-based requirement for heat pump water heaters in the majority of climate zones in California. This is important because of the significant savings in energy use as well as Greenhouse Gas Emissions when switching from gas water heaters to heat pumps. • Electric readiness for all buildings by requiring infrastructure for electrification when it is most cost effective, during initial construction. • The requirement for greater ventilation requirements for gas cookstoves than electric ones, which will encourage use of electric induction stoves. <p>While this progress is positive, it is only one of the many steps needed in the face of the urgency established by the report of the Intergovernmental Panel on Climate Change released on August 6, 2021. In the face of this unfolding crisis, AIA CA has formally recognized a climate emergency (https://aiacalifornia.org/aia-california-declares-a-climate-emergency/) and committed to sustained and continuous actions that address both climate deterioration and California's</p>	Staff appreciates the comment of support and look forward to working with the American Institute of Architects, California, on future code cycles.	8/10/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239236&DocumentContentId=72685
239250.001	NECA	<p>On behalf of the Los Angeles County Chapter of the National Electrical Contractors Association, which represents 300 electrical contracting companies who employ over 7,000 electricians throughout Los Angeles and Ventura counties, we strongly support the adoption of the proposed 2022 Energy Code. Not only is this code essential for California to achieve its aggressive climate goals, facilitating the adoption of sustainable energy technologies will create new careers in the rapidly expanding clean energy sector.</p> <p>By requiring new prescriptive solar photovoltaic and battery storage for many categories of newly constructed nonresidential building types, the proposed code will create a more resilient and reliable grid. As California continues to electrify, it is essential to have distributed solar and storage that can smooth our peak demands, reduce the burden on our transmission and distribution systems in this time of unpredictable wildfires and ease some of the burden of blackouts.</p> <p>California's buildings are responsible for 25% of its GHG emissions; most of this comes from gas and propane appliances. Gas-fueled furnaces, water heaters and stoves significantly compromise air quality and occupant health. By establishing standards to facilitate building electrification and improve air quality, this code will have important health benefits while improving the potential economic benefits of solar and storage.</p>	Staff appreciates the comment of support	8/11/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239250&DocumentContentId=72700

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239254.001	Ann Amato	<p>I am urging the CEC to pass the Title 24 Draft Code. This is a landmark climate step and allows the CEC to again lead the way in addressing climate change. This year's building code update is a step forward in creating affordable and energy efficient housing and helps Californians to be more resilient to the impacts of climate change. It will boost the market for heat pump technology and promote electrification of existing buildings.</p> <p>I purchased an electric heat pump HVAC system and a a heat pump water heater in 2019 with the help of my contractor and SMUD's rebate program. California needs to make this efficient technology more affordable to the public and baseline for new construction.</p> <p>With the current IPCC report, the need for this kind of technology grow even more urgent. Passing this code is a big step toward moving away from planet warming fossil fuels. It is a move toward 100% clean energy, our only hope to have a livable future for our children and grandchildren.</p>	Staff appreciates the comment of support for the code proposal	8/11/2021	15-Day	https://efiling.energy.ca.gov/GetDocument.aspx?tn=239254&DocumentContentId=72704
08.11.2011_CEC_	Alex Bosenberg (NEMA)	We are in support of the proposal changes in harmonization of the Code with one exception - the changes to Table 150.0-A and Table 160.5-A - the strike of the Title 20 lamps ("LED lamps compliant with Title 20") provision from the 45-day language. We encourage the Commission not to strike this provision.	<p>The two programs (T20 & T24) serve two different lighting market segments - one is for and about appliances (lamps) and the other is for new buildings, additions and alterations of buildings.</p> <p>With the removal of the most expensive and time-consuming of the JA8 test, it is expected significant cost of the JA8 test would no longer be there for JA8-compliant products and more competitive-priced products would be available to consumers. Based on the above, the Commission does not accept the comment suggestion.</p>	8/10/2021	15-Day	CEC Meeting 08-11-2021
08.11.2011_CEC_	Jon McHugh (McHugh Energy)	(rebuttal to NEMA's comments) Title 20 and Title 24 are two different standards. Title 20 is intended to apply for lamps in existing installations such as existing residential homes, office buildings and industrial buildings, whereas Title 24 is intended for lamps and light sources installed in newly constructed and renovated buildings.	The Commission thanks the commenter for pointing out the differences between Title 24 Building Energy Efficiency Standards and Title 20 Appliance Efficiency Regulations.	8/10/2021	15-Day	CEC Meeting 08-11-2021
238404.030	Statewide Utility Codes and Standards Enhancement Team	<p>130.1(c)5</p> <p>If intentions is to remove vacancy/partial on requirements for spaces that trigger multilevel, just get rid of all this language. If not, I have no idea what is being said here and how to apply it.</p> <p>Not understanding how to read the changes to 130.1(c)5: I have the choice to use partial-on or vacancy in addition to occupancy sensor, in spaces where multi-level is not required in any room with 1 luminaire and restrooms? So occupancy sensors that turn off all the lights are allowed everywhere and not linked to multi-level? Why not just get rid of anything that speaks to occupancy sensor type as it may be dictated by multilevel?</p> <p>Very confusing</p>	<p>Section 130.1(c)5 was reverted to the 2019 language, and all references to "sensors" were changed to "sensing controls."</p> <p>In areas required by Section 130.1(b) to have multilevel lighting controls, comply by choosing one of the specified and allowed controls.</p> <p>In area NOT required by Section 130.1(b) to have multilevel lighting controls, comply by chosing one of the specified and allowed controls.</p>	6/21/2021	45-Day	https://efiling.energy.ca.gov/efiling/GetFile.aspx?tn=238404&DocumentContentId=71705