

**IECC COMMERCIAL COMMITTEE ACTION REPORT ON THE RESULTS
ON THE 2023
PUBLIC COMMENTS/CODE CHANGES TO PUBLIC COMMENT DRAFT 2
TO THE INTERNATIONAL ENERGY CONSERVATION CODE-COMMERCIAL (9/18/23)**

Introduction

On May 17, 2023, energy.cdpassess.com was open for comment on substantive technical changes made to legislative changes to Public Comment Draft #1. In an effort to expedite the schedule, this comment period was open during the balloting process by the Consensus Committee. Public Comment Draft #2 (PCD #2) incorporates all text revisions to the Public Comment Draft #1 IECC/Chapter 11 of the IRC based on those code changes which have achieved the voting majorities in Section 9.4 of the ICC CP (approval by at least a majority of the committee and at least two-thirds of those voting, excluding abstentions). The submittal deadline was June 30, 2023. 154 comments were submitted. 51 proposals either provided new technical content or portions addressed section that were not available for comment during this period and under ICC Consensus Procedures 9.7 these comments would not be considered in this public comment period. In addition, 6 committee proposals were submitted bringing the total number of proposals to 109. Proposals are identified as follows:

- Commercial Energy Public Comment Draft 2 proposed code changes (CE2D)
- Commercial Energy Committee Public Comment Draft 2(CEC2D) (committee proposal)
- The “Part” listed after the code change indicates the respective items of the code change that involve possible coordination issues between the Commercial and Residential provisions

The process for consideration of the proposals included:

- Posting of the proposals on July 14, 2023
- An open process of review by one of the Subcommittees established by the Consensus Committee, including interested parties
- Subcommittee recommended action on the proposals to the Consensus Committee
- Consensus Committee action on the proposals with an open process including posting of documents and participation by interested parties. The required majority for approval was 2/3 majority in accordance with Section 9.4 of the ICC Consensus Procedures.

This **Committee Action Report (CAR)** includes the following:

- A summary of the actions taken by the respective IECC Consensus Committee from July 2023-September 2023 on each proposal. The Consensus Committee action is noted by one of the following: Approve (as submitted); Approved as Modified; or Disapproved along with the vote count and percentages for a successful action. As noted previously, In accordance with Section 9.4(b) of the [ICC Consensus Procedures \(ICC CP\)](#), the disposition of an item during the public input process required a 2/3 majority . Those proposals that were withdrawn by the proponent are so noted.

- All approved proposals (approve and approved as modified) are included in the CAR in legislative format, including the reason(s) for the committee action. These proposals form the basis for the ballot process below.

The results of the balloting process by the Consensus Committee will be the basis for the final draft of the 2024 IECC Residential and 2024 IRC Chapter 11.

Further information will be posted on ICC's [Energy website](#).

Ballot Instructions

Ballot format

The ballot process will utilize a link to a single electronic ballot, structured below in accordance with Section 9.1 of the ICC CP. This ballot format will be used for subsequent ballots as well. On the signature page of the ballot, instructions will be included with direction for members to vote on the results of the approved code changes by selecting one of the following:

(The annotation in italics will not be included in the ballot)

- Affirmative (all code changes)
 - *An affirmative vote is a single vote to ratify approval of all the proposals approved by the committee.*
- Affirmative with comment (comments on separate file; send to Secretariat)
 - *An affirmative with comment vote is a single vote to ratify approval of all the proposals approved by the committee and allows the voting member to offer comments on specific proposals. Such comments must be identified by code change number on a separate file and sent to the Secretariat for reproduction as part of the recirculation ballot process for all committee members to view. Comments can be in favor, in opposition or neutral but in all cases such comments will not affect the single ratification vote cast on all the proposals. Comments provided with an affirmative vote are for information only, no action is required by the committee.*
- Negative, with reasons (the reasons for a negative vote shall be given and, if possible, should include specific wording or actions that would resolve the objection)
 - *This single vote identifies that the voting member has an objection to one or more of the approved proposals. On a separate file, the proposals must be identified by code change number and a reason for the negative vote on the proposal. If there are text revisions for the committee to consider that would resolve the negative vote, such revisions should be included as well. This file is to be sent to the Secretariat for reproduction as part of the recirculation ballot process for all committee members to view.*
 - *Negative votes to code changes without a reason “shall not be factored into the numerical requirements for consensus” (Section 2.7 (3); 2022 ANSI Essential Requirements).*
 - *Proposals not identified as receiving a negative vote are considered as an affirmative vote.*

In some cases, committee members may wish to abstain on voting on a specific proposal(s). If this is the case, be sure to vote as directed above and in a separate file identify the code change number(s) for which you are abstaining and send to the Secretariat for reproduction as part of the recirculation ballot process for all committee members to view. This abstention can be combined in the same file as an “Affirmative with comment” or “Negative, with reasons”. See Section 9.4 of ICC CP for abstentions - such abstentions are excluded from numerical requirements for required voting majorities.

Ballot #1

The initial ballot, Ballot #1, initiates the balloting process of the CAR.

- Ballot #1 will be open for 30 days. The 30-day deadline requires both the completion of the online ballot as well as the submittal of any comments/reasons.
- Comments received with “Affirmative with comment” ballots will be compiled per proposal as well as reasons for abstentions.
- For each proposal receiving a negative comment, the reasons for the negative and any proposed text revisions to resolve the negative will be compiled per proposal, along with the vote tally on that proposal from Ballot #1.

Ballot #2

The results from Ballot #1 will be recirculated to the committee for review to give committee members an opportunity to review comments provided and, if they choose, to change their vote. See Section 9.6 of the ICC CP for a discussion on recirculation ballots.

- Ballot #2 will be open for 14 days. The 14-day deadline requires both the completion of the online ballot as well as the submittal of any comments/reasons.
- Unless a committee member records a vote change on a given proposal, that committee member’s Ballot #1 vote is presumed to be unchanged. If additional comments are included with their ballot, these comments will be compiled and recirculated as done with Ballot #1.
- If the requisite majorities of Section 9.4 of the ICC CP are achieved on Ballot #2 with affirmative or affirmative with comment, this is final approval of the text revisions to be incorporated into Public Comment Daft #1. Ballot #3 and the remaining steps below are not required.
- If the requisite majorities of Section 9.4 are not achieved on Ballot #2 with affirmative or affirmative with comment, the negative votes and reasons and all other comments will be compiled per proposal, along with the vote tallies per proposal.

Consensus Committee Meeting

The results of Ballots #1 and #2 for those code changes that did not achieve the requisite majorities of Section 9.4 will be compiled and distributed to the committee. These code changes will serve as the agenda for a meeting of the Consensus Committee. Any revisions to the code changes to be considered at the meeting must be developed and submitted at a time to be determined in advance of the meeting. The committee will discuss and vote on the code changes at this meeting. This meeting will be open to interested parties.

Ballot #3

The results of the Consensus Committee meeting will be compiled and sent to the committee. Ballot #3 will be a recirculation ballot sent to those not in attendance at the Consensus Committee meeting. This is the last step in the approval process of the CAR and the determination of the resulting text to be included in Public Comment Draft #2.

- The ballot will be open for 14 days. The 14-day deadline requires both the completion of the online ballot as well as the submittal of any comments/reasons.
- All code changes considered at the Consensus Committee meeting require the requisite majorities of Section 9.4 in order to be incorporated into Public Comment Draft #2.
- Code changes that do not meet these majorities will not be included in Public Comment Draft #2.

As per the instructions provided in the CAR your electronic ballot must be submitted along with any comment/reason statement emailed to the Secretariat (kstenger@iccsafe.org) by **October 18 at 11:59 pm Pacific**. If you have further questions or issues with your ballot please contact the Secretariat.

Results of the Commercial Consensus Committee Public Comment Draft #2 Process July 2023-September 2023

Proposal Number	CC action	vote yes	vote no	abstain	%
CE2D-01-23	disapproved	27	0	1	100%
CE2D-02-23	approve	28	0	0	100%
CE2D-03-23	disapproved	0	0	0	AS failed 17-10-3/D failed 12-14-4 no further action
CE2D-04-23	approved as modified	28	0	2	100%
CE2D-05-23	approved as modified	30	0	1	100%
CE2D-06-23	disapproved	22	7	1	76%
CE2D-07-23	approved as modified	29	0	0	100%
CE2D-08-23	approve	29	0	0	100%
CE2D-09-23	approve	30	0	0	100%
CE2D-10-23	approve	28	0	0	100%
CE2D-11-23	approved as modified	31	0	0	100%
CE2D-12-23	approve	34	0	0	100%
CE2D-13-23	approve	32	0	0	100%
CE2D-14-23	disapproved	31	0	0	100%
CE2D-15-23	approve	31	0	1	100%
CE2D-16-23	approve	29	0	0	100%
CE2D-17-23	approve	28	0	0	100%
CE2D-18-23	approve	31	1	1	97%

Proposal Number	CC action	vote yes	vote no	abstain	%
CE2D-19-23	approved as modified	30	0	0	100%
CE2D-20-23	approve	31	1	0	97%
CE2D-21-23	approve	33	1	0	97%
CE2D-22-23	disapproved	22	8	0	73%
CE2D-23-23	approved as modified	29	0	0	100%
CE2D-24-23	approved as modified	30	0	0	100%
CE2D-25-23	withdrawn				
CE2D-26-23	approved as modified	30	0	0	100%
CE2D-27-23	disapproved	28	1	2	97%
CE2D-28-23	disapproved	28	0	2	100%
CE2D-29-23	approved as modified	26	0	1	100%
CE2D-30-23	withdrawn				
CE2D-31-23	disapproved	19	10	4	66%
CE2D-32-23	withdrawn				
CE2D-33-23	approved as modified	28	0	2	100%
CE2D-34-23	withdrawn				
CE2D-35-23	disapproved	27	2	1	93%
CE2D-36-23	disapproved	29	0	1	100%
CE2D-37-23					
PI	disapproved	27	2	1	93%
CE2D-38-23	approve	38	0	0	100%
CE2D-39-23	approve	29	1	0	97%

Proposal Number	CC action	vote yes	vote no	abstain	%
CE2D-40-23	approve	31	0	0	100%
CE2D-41-23	approved as modified	32	0	0	100%
CE2D-42-23	disapproved	19	7	5	73%
CE2D-43-23	withdrawn				
CE2D-44-23	approved as modified	26	1	4	96%
CE2D-45-23	approved as modified	29	0	0	100%
CE2D-46-23	disapproved	26	2	2	93%
CE2D-47-23	approve	31	0	0	100%
CE2D-48-23	approve	25	3	2	89%
CE2D-49-23	disapproved	19	10	4	66%
CE2D-50-23	disapproved	30	1	1	97%
CE2D-51-23	approved as modified	27	2	4	93%
CE2D-52-23	disapproved	18	15	1	55%
CE2D-53-23	withdrawn				
CE2D-54-23	disapproved	20	10	1	67%
CE2D-55-23	withdrawn				
CE2D-56-23	withdrawn				
CE2D-57-23	approved as modified	34	1	1	97%
CE2D-58-23	approve	27	3	0	90%
CE2D-59-23	withdrawn				
CE2D-60-23	disapproved	30	1	0	97%
CE2D-61-23	approved as modified	34	0	0	100%
CE2D-62-23	disapproved	27	2	0	93%

Proposal Number	CC action	vote yes	vote no	abstain	%
CE2D-63-23	disapproved	28	1	4	97%
CE2D-64-23	approved as modified	29	2	1	94%
CE2D-65-23	disapproved	28	1	2	97%
CE2D-66-23	approved as modified	31	0	0	100%
CE2D-67-23	approve	30	0	0	100%
CE2D-68-23	withdrawn				
CE2D-69-23	approve	25	1	1	96%
CE2D-70-23	approve	28	3	1	90%
CE2D-71-23	approve	32	0	0	100%
CE2D-72-23	disapproved	29	1	1	97%
CE2D-73-23	disapproved	30	1	1	97%
CE2D-74-23	disapproved	26	6	2	81%
CE2D-75-23	approved as modified	31	0	2	100%
CE2D-76-23	approve	30	0	0	100%
CE2D-77-23	approved as modified	29	1	1	97%
CE2D-78-23					
CE2D-79-23	PI approve	30	0	0	100%
CE2D-80-23	disapproved	30	4	1	88%
CE2D-81-23	disapproved	30	4	1	88%
CE2D-82-23	disapproved	30	4	1	88%
CE2D-83-23	withdrawn				
CE2D-84-23	disapproved	30	4	1	88%
CE2D-85-23	disapproved	30	4	1	88%

Proposal Number	CC action	vote yes	vote no	abstain	%
CE2D-86-23	disapproved	30	4	1	88%
CE2D-87-23	disapproved	28	4	2	88%
CE2D-88-23	disapproved	28	4	2	88%
CE2D-89-23	disapproved	28	4	2	88%
CE2D-90-23	disapproved	27	2	2	93%
CE2D-91-23	disapproved	28	4	2	88%
CE2D-92-23	disapproved	27	2	2	93%
CE2D-93-23	disapproved	28	4	2	88%

Proposal Number	CC action	vote yes	vote no	abstain	%
CE2D-94-23	disapproved	28	4	2	88%
CE2D-95-23 PI	approve	31	0	0	100%
CEC2D-1-23	approved as modified	28	0	2	100%
CEC2D-2-23	disapproved	23	4	0	85%
CEC2D-3-23	approve	29	0	2	100%
CEC2D-4-23 PI	approve	29	1	0	97%
CEC2D-5-23	disapproved	13	15	3	46%
CEC2D-6-23	approve	28	1	1	97%

IECC Commercial Committee Action Report on Public Comment Draft #2

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CE2D-2-23

IECC CE: SECTION 202

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

IECC2024D3RECE_CE_Ch02_SecC202_DefSUBSTANTIAL_IMPROVEMENT SUBSTANTIAL IMPROVEMENT. Any *repair*, reconstruction, rehabilitation, *alteration*, *addition* or other improvement of a *building* or structure, the cost of which equals or is more than 50 percent of the market value of the structure before the improvement. Where the structure has sustained substantial damage, as defined in the International Building Code, any repairs are considered *substantial improvement* regardless of the actual *repair* work performed. *Substantial improvement* does not include the following:

1. Improvement of a building ordered by the code official ~~required~~ to correct health, sanitary or safety code violations ~~ordered by the code official~~.
2. *Alteration* of a *historic building* where the *alteration* will not affect the designation as a *historic building*.

Reason Statement:

Edited for clarity.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial.

CE2D-2-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

The proponent is correct that the existing sentence structure implies the code official may have ordered the violations.

CE2D-4-23

IECC CE: 202 (New)

Proponents:

Daniel Carroll, representing Department of State (daniel.carroll@dos.ny.gov); Hendrik Shank, representing NYS Dept. of State (hendrikus.shank@dos.ny.gov)

2024 International Energy Code[CE Project] R3

Revise as follows:

202 .

EMITTANCE. The ratio of the radiant heat flux emitted by a specimen ~~to that emitted by a blackbody at the same temperature and under the same conditions~~ measured on a scale from 0 to 1, where a value of 1 indicates perfect release of thermal radiation.

Reason:

Possible Errata: This definition was changed in the residential provisions and should be coordinated in the commercial provisions.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial Coordination/Errata

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Clarifies definition and correlates with proposal passed at IECC-R.

CE2D-5-23

IECC CE: SECTION 202

Proponents:

Eric Tate, representing Atmos Energy (eric.tate@atmosenergy.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

HIGH-CAPACITY GAS-FIRED WATER HEATERHEATERS. Gas-fired instantaneous water heaters listed to CSA/ANSI Z21.10.3 and having input ratings with a rated input greater than 200,000 Btu/h (58.6 kW). and not less than 4,000 Btu/h per gallon (310 W per litre) of stored water, ~~and~~ Also, gas-fired storage water heaters with a rated input both greater than 105,000 Btu/h (30.8 kW) and less than 4,000 Btu/h per gallon (310 W per litre) of stored water.

Reason:

This definition should be fully consistent with North American consensus standards (Z21.10.3) and not impose the proposed additional requirements that would restrict product availability.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

The definition language is clarifying and for consistency with available listed water heating products.

Workgroup Recommendation

Commercial Energy Committee Committee Action: As Modified

Commercial Energy Committee Reason:

Provide clarification for definition.

CE2D-7-23

IECC CE: TABLE C402.1.3

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

TABLE C402.1.3 OPAQUE BUILDING THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, R-VALUE METHOD ^a

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m², 1 pound per cubic foot = 16 kg/m³.

ci = Continuous Insulation, NR = No Requirement, LS = Liner System.

- a. Assembly descriptions can be found in ANSI/ASHRAE/IES 90.1 Appendix A.
- b. Where using *R*-value compliance method, a thermal spacer block shall be provided, otherwise use the *U*-factor compliance method in Table C402.1.2.
- c. R-5.7ci is allowed to be substituted with concrete block walls complying with ASTM C90, ungrouted or partially grouted not less than 32 inches on center vertically and not less than 48 inches on center horizontally, with ungrouted cores filled with materials having a maximum thermal conductivity of 0.44 Btu-in/h-*F*².
- d. Where heated slabs are below grade, below-grade walls shall comply with the *R*-value requirements for above-grade mass walls .
- e. “Mass floors” shall be in accordance with Section C402.1.3.6.
- f. “Mass walls” shall be in accordance with Section C402.1.3.6.
- g. The first value is for perimeter insulation and the second value is for full, under-slab insulation. Perimeter insulation and full-slab insulation components shall be installed in accordance with Section C402.2.4 .
- h. The first value is *cavity insulation*; the second value is *continuous insulation*. Therefore, “R-0+R-12ci” means R-12 *continuous insulation* and no *cavity insulation*; “R-13+R-3.8ci” means R-13 *cavity insulation* and R-3.8 *continuous insulation*; “R-20” means R-20 *cavity insulation* and no *continuous insulation*. R-13, R-20, and R-27 *cavity insulation* as used in this table apply to a nominal 4-inch (101 mm), 6-inch (152 mm), and 8-inch (203 mm) deep wood or cold-formed steel stud cavities, respectively.
- i. Where the required *R*-value in Table C402.1.3 is met by using continuous insulation such that cavity insulation is not required, the wall assembly framing is permitted to be spaced at any spacing the *R*-value is applicable to any wall framing spacing.

Reason:

Framing is permitted to be spaced at any distance regardless of what the energy code says. This footnote is meaningless.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

no fiscal impact.

Workgroup Recommendation

Commercial Energy Committee Committee Action: As Modified

Commercial Energy Committee Reason:

Clarifies application of insulation to any wall framing configuration.

CE2D-8-23

IECC CE: C402.2.1.3

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C402.2.1.3 Minimum thickness of tapered insulation.

The ~~minimum~~ thickness of tapered above-deck roof insulation at its lowest point, gutter edge, roof drain or scupper, shall be not less than 1 inch (25 mm).

Reason Statement:

"Minimum" is redundant with "not less than."

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial.

CE2D-8-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
Removes redundancy; "minimum" is redundant with "not less than."

CE2D-9-23

IECC CE: C402.6.1.3, C402.6.2, C406.2.1.3

Proponents:

Theresa Weston, representing Air Barrier Association of America (ABAA) (holtweston88@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C402.6.2 Air leakage compliance.

Air leakage of the *building* thermal envelope shall be tested by an *approved* third party in accordance with C402.6.2.1. The measured air leakage shall not be greater than 0.35 cfm/ft (1.8 L/s x m) of the *building* thermal envelope area at a pressure differential of 0.3 inch water gauge (75 Pa) with the calculated *building* thermal envelope surface area being the sum of the above- and below-grade *building* thermal envelope.

Exceptions: Add optional paragraph text here

1.	Where the measured <i>air leakage</i> rate is greater than 0.35 cfm/ft ² (1.8 L/s x m ²) but is not greater than 0.45 cfm/ft ² (2.3 L/s x m ²), the <i>approved</i> third party shall perform a diagnostic evaluation using smoke tracer or infrared imaging. The evaluation shall be conducted while the <i>building</i> is pressurized or depressurized along with a visual inspection of the <i>air barrier</i> in accordance with ASTM E1186. All identified leaks shall be sealed where such sealing can be made without damaging existing <i>building</i> components. A report specifying the corrective actions taken to seal leaks shall be deemed to establish compliance with the requirements of this section where submitted to the <i>code official</i> and the <i>building owner</i> . Where the measured <i>air leakage</i> rate is greater than 0.45 cfm/ft ² (2.3 L/s x m ²), corrective actions must be made to the <i>building</i> and an additional test completed for which the results are 0.45 cfm/ft ² (2.3 L/s x m ²), or less.
2.	Buildings in <i>Climate Zone 2B</i> .
3.	Buildings larger than 25,000 square feet (2300 m ²) floor area in Climate Zones 0 through 4, other than Group R and I occupancies, that comply with C402.6.2.3
4.	As an alternative, buildings or portions of <i>building</i> , containing Group R-2 and I-1 occupancies, shall be permitted to be tested by an <i>approved</i> third party in accordance with C402.6.2.2. The reported <i>air leakage</i> of the <i>building</i> thermal envelope shall not be greater than 0.27 cfm/ft ² (1.4 L/s x m ²) of the <i>testing unit enclosure area</i> at a pressure differential of 0.2 inch water gauge (50 Pa).

~~C402.6.2 Reserved (Potentially move C40213 Air leakage compliance here).~~

Reserved.

C406.2.1.3 E03 Reduced air leakage.

Energy credits shall be achieved where tested *building air leakage* is not less than 10 percent less than the maximum leakage permitted by Section ~~C402.5.2~~ C402.6.2 provided the *building* is tested in accordance with the applicable method in Section ~~C402.5.2~~ C402.6.2. Energy credits achieved for measure E03 shall be determined as follows:

$$EC_{E03} = EC_B \times EC_{adj}$$

(Equation 4-13)

EC_{E03} = Energy ~~efficiency~~ efficiency credits achieved for envelope leakage reduction

EC_B = C406.2.1.3 credits from Tables C406.2(1) through C406.2(9)

EC_{adj} = Ls/EC_a

Ls = Leakage savings fraction: the lessor of $[(Lr-Lm)/Lr]$ or 0.8

Lr = Maximum leakage permitted for tested *buildings*, by occupancy group, in accordance with Section ~~C402.5.2~~ C402.6.2

Lm = Measured leakage in accordance with Section ~~C402.5.2.1~~ C402.6.2.1 or ~~C402.5.2.2~~ C402.6.2.2

EC_a = Energy Credit alignment factor: 0.37 for whole *building* tests in accordance with Section ~~C402.5.2.1~~ C402.6.2.1 or 0.25 for dwelling and *sleeping unit* enclosure tests in accordance with Section ~~C402.5.2.2~~ C402.6.2.2.

Reason Statement:

This is errata on the numbering of sections related to air leakage:

- Renumbers the current (in draft) Section C402.6.1.3 to C402.6.2. In the draft C402.6.2 is titled "Reserved" and it is stated that "potentially move C402.1.3 Air leakage compliance her". The correct numbering is to move C402.6.1.3 to this place.
- corrects the air leakage section numbers referenced in Section C406.2.1.3

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This proposal is errata on section numbering only.

CE2D-9-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
Corrects section numbering.

CE2D-10-23

IECC CE: C402.6.2.3, C405.13.5, C407.5.1.2

Proponents:

Shane Hoeper, representing SEHPCAC

2024 International Energy Code[CE Project] R3

Revise as follows:

C402.6.2.3 Building thermal envelope design and construction verification criteria.

Where Section C402.6.2.1 and C402.6.2.2 are not applicable the installation of the continuous *air barrier* shall be verified by the *code official*, a *registered design professional* or *approved agency* in accordance with the following:

1.	A review of the <i>construction documents</i> and other supporting data shall be conducted to assess compliance with the requirements in Section C402.6.1.
2.	Inspection of continuous <i>air barrier</i> components and assemblies shall be conducted during construction to verify compliance with the requirements of <u>Section</u> C402.6.2.3.1 or C402.6.2.3.2. The <i>air barrier</i> shall remain accessible <u>be provided with access</u> for inspection and <i>repair</i> .
3.	A final inspection report shall be provided for inspections completed by the <i>registered design professional</i> or <i>approved agency</i> . The inspection report shall be provided to the <i>building owner</i> or <i>owner's</i> authorized agent and the <i>code official</i> . The report shall identify deficiencies found during inspection and details of corrective measures taken.

C405.13.5 Graphical energy report.

A permanent and readily ~~accessible~~ available reporting mechanism ~~with ready access~~ shall be provided in the *building* ~~that is accessible~~ has for access by *building* operation and management personnel. The reporting mechanism shall have the capability to graphically provide the electrical energy consumption for each end-use category required by Section C405.13.2 not less than every hour, day, month and year for the previous 36 months. The graphical report shall incorporate natural gas interval data or the ability to enter gas utility bills into the report.

C407.5.1.2 Testing required by software vendors.

Prior to approval, software tools shall be tested by the software vendor in accordance with ASHRAE Standard 140, except Sections 7 and 8. During testing, hidden inputs that are not normally ~~accessible~~ available to the user shall be permitted to avoid introducing source code changes strictly used for testing. Software vendors shall publish, on a publicly available website, the following ASHRAE Standard 140 test results, input files, and modeler reports for each tested version of a software tool:

1.	Test results demonstrating the software tool was tested in accordance with ASHRAE Standard 140 and that meet or exceed the values for "The Minimum Number of Range Cases within the Test Group to Pass" for all test groups in ASHRAE Standard 140, Table A3-14.
2.	Test results of the performance analysis tool and input files used for generating the ASHRAE Standard 140 test cases along with the results of the other performance analysis tools included in ASHRAE Standard 140, Annexes B8 and B16.

3.	The modeler report in ASHRAE Standard 140, Annex A2, Attachment A2.7. Report Blocks A and G shall be completed for results exceeding the maximum or falling below the minimum of the reference values shown in ASHRAE Standard 140 Table A3-1 through Table A3-13, and Report Blocks A and E shall be completed for any omitted results.
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Reason Statement:

Because the term 'accessible' is most commonly understood as requiring access for persons with disabilities we are making the changes to delete the word accessible from the remaining codes and replace it with other words, defined terms or phrases that are not attributed to requiring access for the physically disabled. Many of the codes use the defined term 'access (to)' or 'ready access (to)' for access by maintenance and service personnel or fire departments. This proposal provides clarity and consistency in the remaining codes where those coordination modifications missed or came in as part of new code changes.

This a correlation piece for proposals over the last couple of cycles. This effort was started by the CACs in 2015/16 code change cycle, and continued in 2018/19. This proposal is to provide coordination with the action taken with -P84-15, M2-15, RB2-16, F12-16, CE137-16 Part 1, CE29-19 Part 1 and 2 . G1-21 Part 1 was disapproved; however Part 2 through 7 were approved

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial. Will not change the cost of construction

CE2D-10-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
the word "accessible" should remain reserved for uses associated with accessibility requirements for disabled persons as suggested by the proponent.

CE2D-11-23

IECC CE: C403.3

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

C403.3 Heating and cooling equipment efficiencies.

Heating and cooling equipment installed in mechanical systems shall be sized in accordance with Section C403.3.1 and shall be not less efficient in the use of energy than as specified in Section C403.3.2.

Reason:

This is just editorial changes to the tables that were not modified in the public review but do need some fixing.

The requirements for before 1/1/2023 should be deleted because the date has already passed and just show the after 1/1/2023 requirements.

Also for footnote c the following change should be made.

c. DOE 10 CFR 430 Subpart B Appendix M1 includes the test procedure updates effective 1/1/2023 ~~that will be incorporated~~ are documented in AHRI 210/240—2023.

Bibliography:

Current table aligns with ASHRAE 90.1-2022 but the IECC will be published in 2022 so there is no need to shown the before 2023 requirements.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial. No cost impact.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

The requirements for before 1/1/2023 in tables C403.3.2(1) and (2) should be deleted because the date has already passed and just show the after 1/1/2023 requirements.

CE2D-12-23

IECC CE: C403.3.2

Proponents:

Eric Tate, representing Atmos Energy (eric.tate@atmosenergy.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C403.3.2 HVAC equipment performance requirements.

Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. ~~Efficiency values and metrics in tables shall be equal to the values and metrics shown in ASHRAE 90.1-2022.~~

Reason Statement:

Table values should stand alone and not require the AHJ to enforce ASHRAE appliance and equipment standards as implied by the new language. Regardless, the DOE federal minimum efficiencies, adopted through ASHRAE Standard 90.1 should serve as the table minimums and do not need to be referenced back to ASHRAE.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

The deleted language is superfluous to meeting federally-regulated efficiency requirements and is, therefore, redundant.

CE2D-12-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
statement is no longer needed.

CE2D-13-23

IECC CE: C403.3.2

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

C403.3.2 HVAC equipment performance requirements.

Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. Efficiency values and metrics in tables shall be equal to the values and metrics shown in ASHRAE 90.1-2022.

Reason Statement:

The note c in table C403.3.2(1) is incorrect and needs the following editorial correction.

c. DOE 10 CFR 430 Subpart B Appendix M1 includes the test procedure updates effective 1/1/2023 ~~that will be incorporated~~ documented in AHRI 210/240—2023.

The AHRI 210/240-2023 has already been published in 2022. The -2023 is the name of the standard and not the year of publication. This is confusing.

Bibliography:

AHRI 210/240-2023 was published in 2022. The -2023 just means the standard goes into effect on 1/1/2023

The AHRI approach to call the standard AHRI 210/240-2023 is confusing as the standard was published in 2022 and the 2023 is the effective date or name of the standard.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

No impact on cost.

CE2D-13-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

AHRI 210/240-2023 has already been published in 2022. The -2023 is the name of the standard and not the year of publication. Note that the underline language in C403.3.2 is not a part of the proposal. The proposal is stated within the reason statement.

CE2D-15-23

IECC CE: C403.3.2

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

C403.3.2 HVAC equipment performance requirements.

Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. Efficiency values and metrics in tables shall be equal to the values and metrics shown in ASHRAE 90.1-2022.

Reason Statement:

I see that the staff is going to harmonize with ASHRAE 90.1-2022 which was modified to improve readability. In addition to these changes also eliminate any requirements for before 1/1/2023 as the date is in the past.

Bibliography:

Just an editorial suggested change.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

No cost impact.

CE2D-15-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Good idea to remove references to outdated dates. Note that the underline language in C403.3.2 is not a part of the proposal. The proposal is stated within the reason statement.

CE2D-16-23

IECC CE: C403.3.2

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

C403.3.2 HVAC equipment performance requirements.

Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. Efficiency values and metrics in tables shall be equal to the values and metrics shown in ASHRAE 90.1-2022.

Reason Statement:

In table C403.3.2(1) the requirements for before 1/1/2023 are shown. There is no need to show these requirements as the date has already passed.

Bibliography:

Table as currently written alligns with ASHRAE 90.1, but no need to show the before 1/1/2023

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

No impact on cost

CE2D-16-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
Remove all 2023 date references because it is the 2024 IECC

CE2D-17-23

IECC CE: TABLE C403.3.2(13), TABLE C403.3.2(12)

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

TABLE C403.3.2(13) ELECTRICALLY OPERATED DX-DOAS UNITS, SINGLE-PACKAGE AND REMOTE CONDENSER, WITH ENERGY RECOVERY—MINIMUM EFFICIENCY REQUIREMENTS

a.	Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b.	For minimum efficiency compliance purposes, open <u>Open</u> loop systems shall be <u>are</u> rated using closed-loop test conditions.

TABLE C403.3.2(12) ELECTRICALLY OPERATED DX-DOAS UNITS, SINGLE-PACKAGE AND REMOTE CONDENSER, WITHOUT ENERGY RECOVERY—MINIMUM EFFICIENCY REQUIREMENTS

a.	Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b.	For minimum efficiency compliance purposes, open <u>Open</u> loop systems shall be <u>are</u> rated using closed-loop test conditions.

Reason Statement:

Footnote should not contain requirements. The purpose of the tables are to identify 'minimum efficiency,' so it does not need to be repeated in the footnote.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial.

CE2D-17-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Footnote should not contain requirements. The purpose of the tables are to identify 'minimum efficiency,' so it does not need to be repeated in the footnote.

CE2D-18-23

IECC CE: C403.3.2

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

C403.3.2 HVAC equipment performance requirements.

Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. Efficiency values and metrics in tables shall be equal to the values and metrics shown in ASHRAE 90.1-2022.

Reason Statement:

In the table C403.3.2(3) the capacity range for the water cooled electrically operated centrifugal is missing and ≥ 150 and < 300 tons needs to be added

Bibliography:

Just an editorial to add the missing capacity category for water cooled centrifugals.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Just an editorial correction

CE2D-18-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

In the table C403.3.2(3) the capacity range for the water cooled electrically operated centrifugal is missing and ≥ 150 and < 300 tons needs to be added. Just an editorial to add the missing capacity category for water cooled centrifugals. Note that the underline language in C403.3.2 is not a part of the proposal. The proposal is stated within the reason statement.

CE2D-19-23

IECC CE: TABLE C403.3.2(6)

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

TABLE C403.3.2(6) GAS- AND OIL-FIRED BOILERS—MINIMUM EFFICIENCY REQUIREMENTSⁱ

For SI: 1 British thermal unit per hour = 0.2931 W.

- a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
- b. These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.
- c. E_c = Combustion efficiency (100 percent less flue losses).
- d. E_t = Thermal efficiency.
- e. Maximum capacity—minimum and maximum ratings as provided for and allowed by the unit's controls.
- f. Includes oil-fired (residual).
- g. Boilers shall not be equipped with a constant burning pilot light.
- h. A boiler not equipped with a tankless domestic water-heating coil shall be equipped with an automatic means for adjusting the temperature of the water such that an incremental change in inferred heat load produces a corresponding incremental change in the temperature of the water supplied.
- i. ~~Prior to March 2, 2022, for natural draft very large gas-fired steam commercial packaged boilers, a minimum thermal efficiency level of 77 percent is permitted and meets Federal commercial packaged boiler energy conservation standards~~

Reason:

"*Very large*" is poor code language. What is 'very? What is large? Similarly, '*minimum*' has minimal acceptable application in code.

Whether the equipment meets "*Federal commercial packaged boiler energy conservation standards*" is commentary and not a requirement and should be deleted.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial

Workgroup Recommendation

Commercial Energy Committee Committee Action: As Modified

Commercial Energy Committee Reason:

this footnote isn't applicable anymore since it is for older equipment.

CE2D-20-23

IECC CE: C403.3.2

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

C403.3.2 HVAC equipment performance requirements.

Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. Efficiency values and metrics in tables shall be equal to the values and metrics shown in ASHRAE 90.1-2022.

Reason Statement:

Staff has noted that the table needs to be updated. There are errors in the existing table with duplicate IEER values.

When adopting the 90.1 table 6.8.1-8 eliminate the requirements before 1/1/2023 and also the 2014 AHRI 1230-2014 addendum 1 reference because the new AHRI 1230-2021 goes into effect on 1/1/2024 which will be the effective date for the IECC 2024 standard.

Bibliography:

Suggest changes as the table is need of update.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

No cost impact.

CE2D-20-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

to eliminate dates prior to the publication of 2024 IECC, to harmonize with ASHRAE 90.1 and regulations. Note that the underline language in C403.3.2 is not a part of the proposal. The proposal is stated within the reason statement.

CE2D-21-23

IECC CE: C403.3.2

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

C403.3.2 HVAC equipment performance requirements.

Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. Efficiency values and metrics in tables shall be equal to the values and metrics shown in ASHRAE 90.1-2022.

Reason Statement:

Staff has noted that the table needs to be updated. There are errors in the existing table with duplicate IEER values.

When adopting the 90.1 table 6.8.1-9 eliminate the requirements before 1/1/2023 and also the 2014 AHRI 1230-2014 addendum 1 reference because the new AHRI 1230-2021 goes into effect on 1/1/2024 which will be the effective date for the IECC 2024 standard.

Bibliography:

Editorial updates

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

No cost impact

CE2D-21-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

to eliminate dates prior to the publication of 2024 IECC, to harmonize with ASHRAE 90.1 and regulations. Note that the underline language in C403.3.2 is not a part of the proposal. The proposal is stated within the reason statement.

CE2D-23-23

IECC CE: C403.7.1

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C403.7.1 Demand control ventilation.

Demand control *ventilation* (DCV) shall be provided for the following:

1. Spaces with *ventilation* provided by single-zone systems where an air-side economizer is provided in accordance with Section C403.5.
2. Spaces larger than 250 square feet (23.2 m²) in climate zones 5A, 6, 7, and 8 and spaces larger than 500 square feet (46.5 m²) in other climate zones which have a design occupant load of 15 people or greater per 1,000 square feet (93 m²) of floor area, as established in Table 403.3.1.1 of the International Mechanical Code, and are served by systems with one or more of the following:
 - 2.1. An air-side economizer
 - 2.2. Automatic modulating control of the outdoor air damper.
 - 2.3. A design outdoor airflow greater than 3,000 cfm (1416 L/s)

Exceptions:

1. Spaces served by systems with energy recovery in accordance with Section C403.7.4.2 and that have a floor area less than:
 - 1.1. 6000 square feet (2600 m²) in climate zone 3C.
 - 1.2. 2000 square feet (190 m²) in climate zones 1A, 3B, and 4B.
 - 1.3. 1000 square feet (90 m²) in climate zones 2A, 2B, 3A, 4A, 4C, 5 and 6.
 - 1.4. 400 square feet (40 m²) in climate zones 7 and 8.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. Spaces served by multiple-zone systems with a system design outdoor airflow less than 750 cfm (354 L/s).
4. Spaces where more than 75 percent of the space design outdoor airflow is required for makeup air that is exhausted from the space or transfer air that is required for makeup air that is exhausted from other spaces.

5. Spaces with one of the following occupancy classifications as defined in Table 403.3.1.1 of the *International Mechanical Code*: correctional cells, education laboratories, barber, beauty and nail salons, and bowling alley seating areas.

6. Spaces where the *registered design professional* demonstrates an engineered *ventilation* system design that ~~complies with the following~~:

6.1. ~~It prevents~~ Prevents the maximum concentration of contaminants from ~~exceeding~~ being more than that obtainable by the required rate of outdoor air *ventilation*, and

6.2. ~~It allows~~ Allows the required minimum design rate of outdoor air to be reduced by no less than 15 percent.

Reason:

This may require further edits with SME input.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Editorial

CE2D-24-23

IECC CE: C403.7.8

Proponents:

Michael Jouaneh, representing Lutron Electronics Co., Inc. (mjouaneh@lutron.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C403.7.8 Occupied standby controls.

The following spaces shall be equipped with occupied ~~Occupied~~ standby controls, in accordance with C403.7.8.1, ~~shall be required~~ for each ventilation zone of a system that complies with the following:

~~1. All spaces served by the zone are required to have occupant sensor lighting controls in accordance with C405.2.1.~~

~~2. ASHRAE Standard 62.1 Ventilation Rate Procedure allows the ventilation air to be reduced to zero in all spaces served by the zone during occupied standby mode. Spaces meeting these criteria include:~~

~~2.1. Post-secondary classrooms/lecture/training rooms~~

~~2.2. Conference/meeting/multipurpose rooms~~

~~2.3. Lounges/breakrooms~~

~~2.4. Enclosed offices~~

~~2.5. Open plan office areas~~

~~2.6. Corridors~~

Exception: Zones that are part of a Multiple zone system without *automatic* zone flow control dampers.

Reason:

This suggestion provides clarity for the project team to determine which spaces that are the ones where occupied standby controls would be required by simply listing the spaces not referring to another standard and another section of this code for the project team to determine which spaces would need this functionality. Also changing within 5 minutes to within 20 minutes aligns with the lighting control requirements. If the timeout periods are aligned, it will make it easier for the mechanical system to use the information from the lighting control system if needed.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

No change to cost effectiveness.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

To provide clarity and align with the lighting control requirements.

CE2D-26-23

IECC CE: TABLE C404.2

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

TABLE C404.2 MINIMUM PERFORMANCE OF WATER-HEATING EQUIPMENT

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m², °C = [(°F) – 32]/1.8, 1 British thermal unit per hour = 0.2931 W, 1 gallon = 3.785 L, 1 British thermal unit per hour per gallon = 0.078 W/L.

- a. Thermal efficiency (Et) is a minimum requirement, while standby loss is a maximum requirement. In the standby loss equation, V is the rated volume in gallons and Q is the nameplate input rate in Btu/h. Vm is the measured volume in the tank in gallons. Standby loss for electric water heaters is in terms of %/h and denoted by the term “S,” and standby loss for gas and oil water heaters is in terms of Btu/h and denoted by the term “SL” Draw pattern (DP) refers to the water draw profile in the Uniform Energy Factor (UEF) test. UEF and Energy Factor (EF) are minimum requirements. In the UEF standard equations, Vr refers to the rated volume in gallons.
- b. Chapter 6 contains a complete specification, including the year version, of the referenced test procedure.
- c. A tabletop water heater is a storage water heater that is enclosed in a rectangular cabinet with a flat top surface not more than three feet (0.91 m) in height and has a ratio of input capacity (Btu/h) to tank volume (gal) < 4000.
- d. Water heaters or gas pool heaters in this category are regulated as consumer products by the USDOE as defined in 10 CFR 430.
- e. Storage water heaters have a ratio of input capacity (Btu/h) to tank volume (gal)<4000.
- f. Efficiency requirements for electric storage water heaters ≤ 12 kW apply to both electric resistance and heat pump water heaters. There are no minimum efficiency requirements for electric heat pump water heaters greater than 12kW or for gas heat pump water heaters.
- g. A grid-enabled water heater is an electric resistance water heater that meets all of the following:
 - 1.Has a rated storage tank volume of more than 75 gallons (284 L).
 - 2.Is manufactured on or after April 16, 2015.
 - 3.Is equipped at the point of manufacture with an activation lock.
 - 4.Bears a permanent label applied by the manufacturer that complies with all of the following:
 - 4.1.Is made of material not adversely affected by water.

4.2. Is attached by means of non-water soluble adhesive

4.3. Advises purchasers and end-users of the intended and appropriate use of the product with the following notice printed in 16.5 point Arial Narrow Bold font: "IMPORTANT INFORMATION: This water heater is intended only for use as a part of an electric thermal storage or demand response program. It will not provide adequate hot water unless enrolled in such a program and activated by your utility company or another program operator. Confirm the availability of a program in your local area before purchasing or installing this product."

h. Instantaneous water heaters and hot water supply boilers have an input capacity (Btu/h) divided by storage volume (gal) ≥ 4000 Btu/h-gal.

i. Electric instantaneous water heaters with input capacity >12 kW and ≤ 58.6 kW that have either (1) a storage volume >2 gal (7.6L); or (2) is designed to provide outlet hot water at temperatures greater than 180°F (82°C); or (3) uses three-phase power has no efficiency standard.

j. Gas storage water heaters with input capacity $>75,000$ Btu/h (21.98 kW) and $\leq 105,000$ Btu/h (30.77 kW) must comply with the requirements for the $>105,000$ Btu/h (30.77 kW) if the water heater either (1) has a storage volume >120 gal (454L); (2) is designed to provide outlet hot water at temperatures greater than 180°F (82°C); or (3) uses three-phase power.

k. Refer to Section C404.2.1 for additional requirements for gas storage and instantaneous water heaters and gas hot-water supply boilers. l. Oil storage water heaters with input capacity $>105,000$ Btu/h (30.77 kW) and $\leq 140,000$ Btu/h (41.03 kW) must comply with the requirements for the $>140,000$ Btu/h (41.03 kW) if the water heater either (1) has a storage volume >120 gal (454L); (2) is designed to provide outlet hot water at temperatures greater than 180°F (82°C); or (3) uses three-phase power.

l. Water heaters and hot water supply boilers ~~having~~ with more than 140 gallons (530L) of storage capacity need not meet the standby loss requirement ~~if where~~: (1) The tank surface area is thermally insulated to R-12.5 or more; (2) ~~a~~ there is no standing pilot light ~~is not used~~; and (3) for gas or oil-fired storage water ~~heaters heaters, they have~~ the heater is equipped with a fire damper or fan-assisted combustion

Reason:

Editorial.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Editorial

CE2D-29-23

IECC CE: C405.13.8, C405.13, C105.6.2 (New)

Proponents:

Bryan Holland, representing National Electrical Manufacturers Association (NEMA) (bryan.holland@nema.org)

2024 International Energy Code[CE Project] R3

Delete without substitution:

~~C405.13.8 Plan for disclosure.~~

~~The plan for annual energy use data gathering and disclosure shall include the following:~~

~~1. Property information including:~~

~~—— 1.1 .Address~~

~~—— 1.2 .Gross floor area~~

~~—— 1.3 .Year occupied~~

~~—— 1.4 .Occupancy classifications, with respective floor areas~~

~~2. Total annual *building site* energy use by unit area as collected or documented through Section C405.13.5 and Section C405.13.6 sources, separated by energy type and fuel type.~~

~~3. Annual site generated renewable energy by unit area.~~

Revise as follows:

C405.13 Energy monitoring.

New buildings with a gross *conditioned floor area* of not less than 10,000 square feet (929 m²) shall be equipped to measure, monitor, record and report energy consumption data in compliance with Sections C405.13.1 through C405.13.5. ~~A plan for quantifying annual energy type and end use disclosure in compliance with Sections C405.13.1 through C405.13.8 shall be submitted with the *construction documents*.~~

Exceptions:

1. *Dwelling units* in R-2 occupancies
2. Individual tenant spaces are not required to comply with this section provided that the space has its own utility services and meters and has less than 5,000 square feet (464.5 m²) of *conditioned floor area* .

C105.6.2 Compliance documentation.

Energy code compliance documentation and supporting calculations shall be delivered in one document to the building owner as part of the project record documents or manuals, or as a standalone document. This document shall include the specific energy code edition utilized for compliance determination for each system, documentation demonstrating compliance with Section C303.1.3 for each fenestration product installed, and

the interior lighting power compliance path, building area or space-by-space, used to calculate the lighting power allowance.

For projects complying with Item 2 of Section C401.2, the documentation shall include:

1. The envelope insulation compliance path.
2. All compliance calculations including those required by Sections C402.1.4, C403.8.1, C405.3 and C405.5.
3. A plan for annual energy use data gathering and disclosure as specified in Section C405.13.

For projects complying with Section C407, the documentation shall include that required by Sections C407.3.1 and C407.3.2.

Reason:

Plan for disclosure section does not belong in the Energy Monitoring section because it has nothing to do with how energy is monitored. It is more appropriate to be in in the General (C401) section.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This is an editorial change.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

A plan for quantifying annual energy type and end-use disclosure requirement is best located in Chapter 1 versus C405.13.

CE2D-33-23

IECC CE: C405.13, C405.13.1 (New), C405.13.2, TABLE C405.13.2, C405.13.3, C405.13.5, C405.13.6, C405.13.7, C405.13.7 (New), C405.13.8 (New), TABLE C405.13.8 (New), C405.13.9 (New), C405.13.10 (New), C405.13.11 (New)

Proponents:

Renee Lani, representing American Public Gas Association (rlani@apga.org)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.13 Energy monitoring.

New buildings with a gross *conditioned floor area* of not less than 10,000 square feet (929 m²) shall be equipped to measure, monitor, record and report energy consumption ~~data in compliance~~ accordance with Sections C405.13.1 through C405.13.5 for load categories indicated in Table C405.13.2 and Section C405.13.7 through C405.13.11 for end-use categories indicated in Table C405.13.8. A plan for quantifying annual energy type and end-use disclosure in compliance with Sections C405.13.1 through C405.13.8 shall be submitted with the *construction documents*.

Exceptions:

1. *Dwelling units* in R-2 occupancies
2. Individual tenant spaces are not required to comply with this section provided that the space has its own utility services and meters and has less than 5,000 square feet (464.5 m²) of *conditioned floor area*.

C405.13.1 Electrical energy metering.

For ~~all~~ electrical energy supplied to the building and its associated site, including but not limited to site lighting, parking, recreational facilities and other areas that serve the building and its occupants, meters or other measurement devices shall be provided to collect energy consumption data for each end-use category required by Section C405.13.2.

C405.13.2 End-use electric metering categories.

Meters or other *approved* measurement devices shall be provided to collect energy use data for each end-use category indicated in Table C405.13.2. Where multiple meters are used to measure any end-use category, the data acquisition system shall total all of the energy used by that category. Not more than 5 percent of the ~~measured~~ design load for each of the end-use categories indicated in Table C405.13.2 shall be permitted to be from a load that is not within that category.

Exceptions:

1. HVAC and water heating equipment serving only an individual *dwelling unit* shall not require end-use metering.
2. End-use metering shall not be required for fire pumps, stairwell pressurization fans or any system that operates only during testing or emergency.

3. End-use metering shall not be required for an individual tenant space having a floor area not greater than 2,500 square feet (232 m²) where a dedicated source meter complying with Section C405.13.3 is provided.

TABLE C405.13.2 ELECTRICAL ENERGY USE CATEGORIES

LOAD CATEGORY	DESCRIPTION OF ENERGY USE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.
Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process load	Any single load that is not included in an HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment and commercial kitchens.
<i>Electric vehicle</i> charging	<i>Electric vehicle</i> charging loads that are powered through the <i>building's</i> electrical service.
Building operations and other miscellaneous loads	The remaining loads not included elsewhere in this table, including but not limited to vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas and snow-melt systems.
Electric hot water heating for uses other than space conditioning	Electricity used to generate hot water. Exception: Electric water heating with design capacity that is less than 10 percent of building service rating

C405.13.3 Electrical Meters.

Meters or other measurement devices required by this section shall be configured to automatically communicate energy consumption data to the data acquisition system required by Section C405.13.4. Source meters shall be allowed to be any digital-type meter. Lighting, HVAC or other *building* systems that can self-monitor their energy consumption shall be permitted instead of meters. Current sensors shall be permitted, provided that they have a tested accuracy of ±2 percent. Required metering systems and equipment shall have the capability to provide at least hourly data that is fully integrated into the data acquisition system and graphical energy report in accordance with Sections C405.13.4 and C405.13.5. Non-intrusive load monitoring (NILM) packages that extract energy consumption data from detailed electric waveform analysis shall be permitted to substitute for individual meters if the equivalent data is available for collection in Section C405.13.4 and reporting in Section C405.13.5.

C405.13.5 Graphical energy report.

A permanent and readily accessible reporting mechanism shall be provided in the *building* that is accessible by *building* operation and management personnel. The reporting mechanism shall have the capability to graphically provide the electrical energy consumption for each end-use category required by Section C405.13.2 not less than every hour, day, month and year for the previous 36 months. ~~The graphical report shall incorporate natural gas interval data or the ability to enter gas utility bills into the report.~~

Delete without substitution:

~~C405.13.6 Non electrical energy.~~

~~Consumption of non electrical fuel or energy sources including district heating or cooling shall be metered in accordance with Section C405.13.2 and C405.13.3.~~

Revise as follows:

~~C405.13.7~~C405.13.6 Renewable energy.

On-site renewable energy sources shall be metered with not less frequency than non-renewable energy systems in accordance with Section C405.13.3.

Add new text as follows:

C405.13.7 Non-electrical energy submetering.

For all non-electrical energy supplied to the building and its associated site that serves the building and its occupants, submeters or other measurement devices shall be provided to collect energy consumption data for each end-use category required by Section C405.13.8.

Exceptions:

1. HVAC and water heating equipment serving only an individual dwelling unit shall not require end-use submetering.
2. End-use submetering shall not be required for fire pumps, stairwell pressurization fans or any system that operates only during testing or emergency.
3. End-use submetering shall not be required for an individual tenant space having a floor area not greater than 2,500 square feet (232 m²) where a dedicated source meter complying with Section C405.13.9 is provided.
4. Equipment powered primarily by solid fuels serving loads other than building heating and service water heating loads.

C405.13.8 End-use non-electrical submetering categories.

Submeters or other approved measurement devices shall be provided to collect energy use data for each end-use category indicated in Table C405.13.8. Where multiple submeters are used to measure any end-use category, the data acquisition system shall total all of the energy used by that category. Not more than 5 percent of the design load for each of the end-use categories indicated in Table C405.13.8 shall be permitted to be from a load that is not within that category.

TABLE C405.13.8 Non-electrical energy use categories

<u>END-USE CATEGORY</u>	<u>DESCRIPTION OF END USE</u>
<u>TOTAL HVAC SYSTEM</u>	<u>Heating and cooling systems, including but not limited to boilers, chillers and furnaces. District heating and cooling energy entering the buildings distribution system shall, be monitored at the point of entry to the building distribution system.</u>
<u>Process loads</u>	<u>Any single load that is not included in the HVAC or service water heating categories where the rated fuel gas or fuel oil input of the load and that is not less than 5 percent of the sum of the rated fuel gas or fuel oil input of all monitored equipment, including but</u>

	<u>not limited to manufacturing equipment, process equipment, commercial kitchens, and commercial laundry equipment.</u>
<u>Other miscellaneous loads</u>	<u>The remaining loads not included elsewhere in this table, including but not limited to fireplaces, swimming pools, spas, gas lighting, and snow-melt systems.</u>
<u>Service water heating</u>	<u>Fuel used to heat potable water</u> <u>Exception: Water heating with design capacity that is less than 10 percent of the sum of the rated fuel gas or fuel oil input of all monitored equipment.</u>

C405.13.9 Non-electrical submeters.

Submeters or other measurement devices required by this section shall be configured to automatically communicate energy consumption data to the data acquisition system required by Section C405.13.10. Source submeters shall be allowed to be any digital-type meter that can provide a digital output to the data acquisition system. Required submetering systems and equipment shall be fully integrated into the data acquisition system and graphical energy report that updates at least hourly in accordance with Sections C405.13.10 and C405.13.11.

C405.13.10 Non-electrical energy data acquisition system.

A data acquisition system shall have the capability to store the data from the required submeters and other sensing devices for not less than 36 months. The data acquisition system shall have the capability to store real-time energy consumption data and provide hourly, daily, monthly and yearly logged data for each end-use category required by Section C405.13.8. The data acquisition system shall have the capability of providing building total non-electrical peak demand and the time(s) of day and time(s) per month at which the peak occurs. Where applicable as determined by the AHJ, peak demand shall be integrated over the same time period as the underlying whole building meter reading rate.

C405.13.11 Graphical energy report.

A permanent and readily accessible reporting mechanism shall be provided in the building that is accessible by building operation and management personnel. The reporting mechanism shall have the capability to graphically provide the non-electrical energy consumption for each end-use category required by Section C405.13.8 not less than every hour, day, month and year for the previous 36 months. The graphical report shall incorporate natural gas interval data from the submeter or the ability to enter gas utility bills into the report.

Reason:

APGA appreciates the opportunity to provide IECC-C Committee this input. APGA is the national trade association for approximately 1,000 communities across the U.S. that own and operate their own retail natural gas distribution entities. They include municipal gas distribution systems, public utility districts, county districts, and other public agencies, all locally accountable to the citizens they serve. Public gas systems focus on providing safe, reliable, resilient, and affordable natural gas service to their customers. APGA members

serve their communities by providing sustainable and clean energy to be used for cooking, clothes drying, and space and water heating, as well as for various commercial and industrial applications.

APGA is very concerned with this proposal, as it assumes that all natural gas utilities have the same metering capabilities. APGA represents utilities of all shapes and sizes, and most of our members have not deployed advanced metering technology that can meter in the way the IECC hopes to collect data. Furthermore, because of their small size, APGA's members may not have the resources to help implement such metering programs. Instead, APGA suggests that the metering be limited to electric metering only, as advanced electric metering technology is much more prevalent these days.

Cost Impact:

The code change proposal will decrease the cost of construction.

This proposal will decrease the cost of construction, as it will not reduce the cost of metering equipment that may not even be permitted by law/regulation or useable by the local utility.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

this proposal would add the word "electrical" to the title of Section C405.13.3 and the associated table.

CE2D-38-23

IECC CE: C405.16.2.4

Proponents:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.16.2.4 ESS-ready minimum system capacity.

Compliance with ESS-ready requirements in Sections C405.16.2.1 through C405.16.2.3 shall be based on a minimum total energy capacity and minimum rated power capacity as follows:

1.	ESS rated energy capacity (kWh) \geq gross <i>conditioned floor area</i> of the three largest floors (ft ²) x 0.0008 kWh/ft ²
2.	ESS rated power capacity (kWh kW) \geq gross <i>conditioned floor area</i> of the three largest floors (ft ²) x 0.0002 kWh kW/ft ²

Reason Statement:

This proposed change corrects the units used in the equation (kW is the correct unit for power, as kWh is the unit of energy).

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This is only an editorial correction.

CE2D-38-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
Editorial correction of the equation.

CE2D-39-23

IECC CE: C405.2.1 (New)

Proponents:

Aaron McEwin, representing Jordan & Skala Engineers (amcewin@jordanskala.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.2.1 Occupant sensor controls.

Occupant sensor controls shall be installed to control lights in the following space types:

1.	Classrooms/lecture/training rooms.
2.	Conference/meeting/multipurpose rooms.
3.	Copy/print rooms.
4.	Lounges/breakrooms.
5.	Enclosed offices.
6.	Open plan office areas.
7.	Restrooms.
8.	Storage rooms.
9.	Locker rooms.
10.	Corridors
11 10.	Warehouse storage areas.
12 11.	Other spaces 300 square feet (28 m ²) or less that are enclosed by floor-to-ceiling height partitions.

Reason Statement:

Corridor and Exit Passageway are defined in the 2021 International Building Code.

Corridor. An enclosed exit access component that defines and provides a path of egress.

Exit Passageway. An exit component that is separated from other interior spaces of a building or structure by fire-resistance construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to an exit or the exit discharge.

This is in conflict with C405.2 Exception 2. Interior exit stairways, interior exit ramps and exit passageways.

Bibliography:

2021 International Building Code - Definitions 'Corridor' and 'Exit Passageway'

Cost Impact:

The code change proposal will decrease the cost of construction.

This will decrease the need for occupancy controls in corridors, thus reducing construction cost.

CE2D-39-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Corridors are exit access components, so there is no conflict with the exception for exit passageways in the IECC. The committee also sees no conflict with the life safety requirements in the IBC. There is significant energy savings associated with keeping the requirement for OS in corridors.

CE2D-40-23

IECC CE: C405.2.10.1, C405.2.10.2

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.2.10.1 Sleeping units and dwelling units in hotels, motels, and vacation timeshare properties.

Sleeping units and dwelling units in hotels, motels and vacation timeshare properties shall be provided with the following:

1.	At least Not less than two 125V, 15- and 20- amp switched receptacles per <u>in each</u> room, except for bathrooms, kitchens, foyers, hallways, and closets.
2.	Lighting controls that automatically turn off all lighting and switched receptacles within 20 minutes after all occupants have left the unit.

Exception: *Automatic* shutoff is not required where *captive key override* controls all lighting and switched receptacles in units with 5 or fewer permanently installed lights and switched receptacles.

C405.2.10.2 Sleeping units in congregate living facilities.

Sleeping units in congregate living facilities shall be provided with the following controls:

1.	Lighting in bathrooms shall be controlled by an <i>occupant sensor control</i> that automatically turns lights off within 20 minutes after all occupants have left the space.
2.	Each unit shall have a <i>manual</i> control by the entrance that turns off all lighting and switched receptacles in the unit, except for lighting in bathrooms and kitchens. The <i>manual</i> control shall be clearly <i>labeled</i> .

Reason Statement:

Item 1 = editorial. Item 2 = mitigating a hazardous condition.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

No additional requirements proposed.

CE2D-40-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
These are editorial changes that help to clarify the language

CE2D-41-23

IECC CE: C405.2.10.2

Proponents:

Bryan Holland, representing National Electrical Manufacturers Association (NEMA) (bryan.holland@nema.org)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.2.10.2 Sleeping units in congregate living facilities.

Sleeping units in congregate living facilities shall be provided with the following controls:

1. Lighting in bathrooms shall be controlled by an *occupant sensor control* that automatically turns lights off within 20 minutes after all occupants have left the space.
2. Each unit shall have a *manual* control by the entrance that turns off all lighting and switched receptacles in the unit, except for lighting in bathrooms. The *manual* control shall be ~~clearly~~ labeled ~~marked to indicate its function.~~

Reason:

The term “labeled” is a defined term that is not used in this context. Changing to “permanently marked” is consistent with other codes in identifying the purpose of a device’s function. This fixes the issue of the subjectivity of using the word “clearly”.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This change is editorial in nature.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Replaces a vague term and defined term with an enforceable marking requirement.

CE2D-44-23

IECC CE: C405.2.8

Proponents:

Tim Peglow, representing self (tpeglow@mdanderson.org)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.2.8 Demand responsive lighting controls.

Interior general lighting in group B, E, M, and S occupancies shall have demand responsive controls complying with C405.2.8.1 in not less than 75 percent of the interior floor area.

Exceptions:

1. Where the combined interior floor area of group B, E, M, and S occupancies is less than 10,000 square feet.
2. *Buildings* where a *demand response signal* is not available from a controlling entity other than the *owner*.
3. Parking garages
4. Ambulatory Care Facilities
5. Outpatient clinics
6. Physician or dental offices

Reason:

Ambulatory care facilities by the nature of the care delivered should be exempt from demand response programs for lighting. Ambulatory surgery lighting should not be reduced due to a demand response event.

Cost Impact:

The code change proposal will decrease the cost of construction.

This added exemption will reduce cost of construction in an ambulatory surgery facility.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

The proponent identified an important safety concern in medical occupancies within Group B Buildings. This is further modified to capture all medical occupancies that will be found in Group B buildings with the scope of the exception.

CE2D-45-23

IECC CE: C405.2.8, C405.2.8.1

Proponents:

Harold Jepsen, representing Legrand (harold.jepsen@legrand.us)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.2.8 Demand responsive lighting controls.

Interior *general lighting* in group B, E, M, and S occupancies shall have *demand responsive controls* complying with C405.2.8.1 in not less than 75 percent of the interior floor area.

Exceptions:

1. Where the combined interior floor area of group B, E, M, and S occupancies is less than 10,000 square feet (929 m²).
2. *Buildings* where a *demand response signal* is not available from a controlling entity other than the *owner*.
3. Parking garages

C405.2.8.1 Demand responsive lighting controls function. *Demand responsive controls* for lighting controls shall be capable of the following:

1. Automatically reducing the output of ~~demand-responsive~~ controlled lighting to 80 percent or less of full power or light output upon receipt of a *demand response signal*.
2. Where *high-end trim* has been set, automatically reducing the output of controlled lighting to 80 percent or less of the *high-end trim* set point upon receipt of a *demand response signal*.
3. Dimming controlled lights gradually and continuously over a period of not longer than 15 minutes to ~~get to~~achieve their demand response setpoint.
4. Returning controlled lighting lights to ~~their~~ its normal operational settings at the end of the *demand response period*~~event~~.

Exception: ~~Storage rooms and warehouse storage~~ Warehouse and retail ~~building storage building~~ areas shall be permitted to switch off 25 percent or more of *general lighting* power rather than dimming.

Reason:

These changes are editorial to provide greater clarity to the provision requirements. These changes align language with defined terms, removes language redundancy, italicizes defined terms, and improves parallel language structure for clarity. The stringency, intent or application of the code is not altered with these changes.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

These changes are editorial and for greater clarity.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Editorial changes provide clarity and alignment with defined terms.

CE2D-47-23

IECC CE: C405.3.1

Proponents:

Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.3.1 Total connected interior lighting power.

The total connected interior lighting power shall be determined in accordance with Equation 4-9.

$$TCLP = [LVL + BLL + LED + TRK + Other]$$

(Equation 4-9)

where:

TCLP = Total connected lighting power (watts).

LVL = For luminaires with lamps connected directly to *building* power, such as line voltage lamps, the rated wattage of the lamp.

BLL = For luminaires incorporating a ballast or transformer, the rated input wattage of the ballast or transformer when operating that lamp.

LED = For light-emitting diode luminaires with either integral or remote drivers, the rated wattage of the luminaire.

TRK = For lighting track, cable conductor, rail conductor, and plug-in busway systems that allow the addition and relocation of luminaires without rewiring, the wattage shall be one of the following:

1.	The specified wattage of the luminaires, but not less than 8 W per linear foot (25 W/lin m).
2.	The wattage limit of the permanent current-limiting devices protecting the system.
3.	The wattage limit of the transformer supplying the system.

Other = The wattage of all other luminaires and lighting sources not covered previously and associated with interior lighting verified by data supplied by the manufacturer or other *approved* sources.

The connected power associated with the following lighting equipment and applications is not included in calculating total connected lighting power.

1.	Emergency lighting that is automatically off during normal operations.
2.	Lighting in spaces specifically designed for use by occupants with special lighting needs, including those with visual impairment and other medical and age-related issues.
3.	Mirror lighting in makeup or dressing areas used for video broadcasting, video or film recording, or live theatrical and music performance.

4.	Task lighting for medical and dental purposes that is in addition to <i>general lighting</i> .
5.	Display lighting for exhibits in galleries, museums and monuments that is in addition to <i>general lighting</i> .
6.	Lighting in any location that is specifically used for video broadcasting, video or film recording, or live theatrical and music performance.
7.	Lighting for photographic processes.
8.	Lighting integral to equipment or instrumentation and installed by the manufacturer.
9.	Task lighting for plant growth or maintenance.
10.	Advertising signage or directional signage.
11.	Lighting for food warming.
12.	Lighting equipment that is for sale.
13.	Lighting demonstration equipment in lighting education facilities.
14.	Lighting <i>approved</i> because of safety considerations.
15.	Lighting in retail display windows, provided that the display area is enclosed by ceiling-height partitions.
16.	Furniture-mounted supplemental task lighting that is controlled by automatic shutoff.
17.	Exit signs.
18.	Antimicrobial lighting used for the sole purpose of disinfecting a space.
19.	Lighting in sleeping units and dwelling units.
20.	For exit access <u>and exit stairways</u> , exit stairways and their <u>including landings</u> , where the applicable building code or life safety code requires a minimum <u>an</u> illuminance of 10 footcandles <u>or more</u> on the walking surface, the power in excess of the allowed power calculated according to C405.3.2.2, is not included.

Reason Statement:

Edited for clarity.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial.

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Provides clearer language for applying the exception of lighting power.

CE2D-48-23

IECC CE: C405.3.3

Proponents:

Michael Jouaneh, representing Lutron Electronics Co., Inc. (mjouaneh@lutron.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C405.3.3 Lighting power for sleeping units and dwelling units.

Sleeping units in Group I-2 occupancies that are patient rooms shall comply with C405.3.1 and C405.3.2. For all other sleeping units and dwelling units, permanently installed lighting including lighting integrated into range hoods and exhaust fans, shall be provided by lamps capable of operating with an efficacy of not less than 65 lm/W or luminaires capable of operating with an efficacy of not less than 45 lm/W.

Exceptions:

1.	Lighting integral to other appliances.
2.	Antimicrobial lighting used for the sole purpose of disinfecting.
3.	Luminaires with an input rating of less than 3W.

Reason Statement:

Efficacy changes in most light sources depending on the setting the lighting is operating in. Most lighting is dimmable (changes in intensity), and some allow for changes in color temperature and/or hue (e.g., color tunable lighting that can change the lighting from white light to red or blue etc.). Efficacy of the lighting changes depending on these settings. Particularly with color tunable lighting, which can meet the efficacy thresholds when operating in white but may be below the threshold when operating in a specific color like blue. So, this added phrase "capable of operating" allows dynamic lighting to comply especially color tunable lighting. Also, this change will make the commercial code consistent with the residential code for this same requirement.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial.

CE2D-48-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Adds "capability of operating" before the efficacy requirements. Addresses color tuning / changing light sources.

CE2D-51-23

IECC CE: TABLE C406.1.1(2), C406.1.1, C406.1.1.1, C502.3.7, C502.3.7.1

Proponents: Laura Petrillo-Groh, representing Air-Conditioning, Heating, and Refrigeration Institute (lpetrillo-groh@ahrinet.org); Vladimir Kochkin, representing NAHB (vkochkin@nahb.org); Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com); Andrew Klein, representing BOMA International (andrew@asklein.com); Robert Ross, representing Self (robertross1952@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

TABLE C406.1.1(2) LIMIT TO ENERGY EFFICIENCY CREDIT CARRYOVER FROM RENEWABLE AND LOAD MANAGEMENT CREDITS

BUILDING OCCUPANCY GROUP	CLIMATE ZONE																		
	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
R-2, R-4, AND I-1	5	5	5	5	5	5	5	5 <u>24</u>	5 <u>19</u>	5	5 <u>22</u>	5 <u>18</u>	5	5	5 <u>19</u>	5	5	5	5
I-2	16	14	11	8	6	5	5	5 <u>10</u>	5 <u>6</u>	5 <u>8</u>	5 <u>14</u>	5 <u>10</u>	6 <u>17</u>	15 <u>26</u>	18 <u>29</u>	14 <u>21</u>	14 <u>21</u>	14 <u>22</u>	25 <u>39</u>
R-1	7	5	8	5	19	5	13 <u>32</u>	20 <u>40</u>	20 <u>41</u>	5 <u>24</u>	20 <u>41</u>	20 <u>42</u>	5 <u>17</u>	16 <u>37</u>	18 <u>41</u>	5	5 <u>24</u>	5 <u>15</u>	5 <u>22</u>
B	7	5	5	8	6	6	5 <u>14</u>	4 <u>26</u>	4 <u>31</u>	5 <u>23</u>	21 <u>39</u>	15 <u>34</u>	5 <u>19</u>	16 <u>35</u>	26 <u>45</u>	5	5 <u>19</u>	5 <u>17</u>	9 <u>27</u>
A-2	18	16	14	15	13	9	5 <u>11</u>	5 <u>23</u>	4 <u>32</u>	5	5 <u>23</u>	5 <u>23</u>	5	5	7 <u>26</u>	5	5	5	5
M	5	5	5	5	5	5	5	5	5 <u>20</u>	5	5	5	5	5	5	5	5	5	5
E	13	13	18	16	17	14	6 <u>21</u>	20 <u>35</u>	25 <u>40</u>	9 <u>25</u>	26 <u>43</u>	13 <u>29</u>	7 <u>23</u>	15 <u>32</u>	14 <u>27</u>	5 <u>11</u>	5 <u>17</u>	9 <u>25</u>	5
S-1 AND S-2	5	5	5	5	5	5	5	5	5 <u>13</u>	5	5 <u>17</u>	5 <u>20</u>	5	14 <u>35</u>	5 <u>23</u>	5	5	5 <u>11</u>	17 <u>40</u>
All Other	5	5	5	5	5	5	5	5 <u>7</u>	5 <u>17</u>	5	5 <u>10</u>	5 <u>7</u>	5	5 <u>6</u>	5 <u>11</u>	5	5	5	5

C406.1.1 Additional energy efficiency credit requirements. Buildings shall comply with measures from C406.2 to achieve not less than the number of required efficiency credits from Table C406.1.1(1) based on *building* occupancy group and *climate zone* including any energy credit adjustments in accordance with C406.1.1.1.

Where a project contains multiple occupancies, the total required energy credits in Table C406.1.1(1) from each *building* occupancy shall be weighted by the gross conditioned floor area to determine the weighted average project energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of Section C406.

Exceptions:

1. Portions of buildings devoted to manufacturing or industrial use.
2. Where a building achieves more renewable and load management credits in Section C406.3 than are required in Section C406.1.2, surplus credits shall be permitted to reduce the required energy efficiency credits as follows:

$$EEC_{red} = EEC_{tbl} - \{the\ lesser\ of:\ (SRLM_{lim},\ SRLM_{adj} \times [RLM_{ach} - RLM_{req}])\}$$

EECred = Reduced required energy efficiency credits

EECtbl = Required energy efficiency credits from Table C406.1.1(4)

SRLMlim = Surplus renewable and load management credit limit from Table C406.1.1(2)

SRLMadj = 1.0 for all-electric or all-renewable buildings (excluding emergency generation)
0.7 for buildings with fossil fuel equipment (excluding emergency generation)

RLMach = Achieved renewable and load management credits from Section C406.3

RLMreq = Required renewable and load management credits from Section C406.1.2

C406.1.1.1 Buildings without heat pumps. The number of efficiency credits required by Section C406.1.1 shall be multiplied by 1.25 for the following:

1. Buildings using purchased energy that is not electricity for space heating or service water heating,
2. Buildings with electric storage water heaters that are not heat pumps
3. Buildings with total heat pump space heating capacity less than the space heating load at heating design conditions calculated in accordance with Section C403.1.1

~~Buildings using purchased energy that is not electricity for space heating or service water heating, buildings with electric storage water heaters that are not heat pumps and buildings with total heat pump space heating capacity less than the space heating load at heating design conditions calculated in accordance with Section C403.1.1 shall comply with measures from C406.2 to achieve not less than 1.25 multiplied by the number of required efficiency credits from Table C406.1.1 based on building occupancy group and climate zone. Where a project contains multiple occupancies, credits in Table C406.1.1 from each building occupancy shall be multiplied by 1.25 and weighted by the gross conditioned floor area to determine the weighted average project energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of Section C406.~~

Exceptions:

1. Portions of buildings devoted to manufacturing or industrial use.
2. Buildings complying with all of the following:
 - 2.1 The building's peak heating load calculated in accordance with Section C403.1.1 is greater than the building's peak cooling load calculated in accordance with Section C403.1.1.
 - 2.2 The building's total heat pump space heating capacity is not less than 50 percent of the building's space heating load at heating design conditions calculated in accordance with Section C403.1.1.
 - 2.3 Any energy source other than electricity or on-site renewable energy is used for space heating only when a heat pump cannot provide the necessary heating energy to satisfy the thermostat setting.
 - 2.4 Electric resistance heat is used only in accordance with Section C403.4.1.1.
3. Low-energy buildings complying with Section C402.1.1.1.

4. Portions of buildings in Utility and Miscellaneous Group U, Storage Group S, Factory Group F, or High-Hazard Group H.

C502.3.7 Additional energy efficiency credits. *Additions* shall comply with measures from Sections C406.2 and C406.3 to achieve not less than 50 percent the number of required efficiency credits from Table C406.1.1 based on *building* occupancy group and *climate zone*. Where a project contains multiple occupancies, credits in Table C406.1.1 from each *building* occupancy shall be weighted by the gross floor area to determine the weighted average project energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of this section. *Alterations* to the existing *building* that are not part of an *addition*, ~~may~~ shall be permitted to be used to achieve the required credits.

Exceptions:

1. Buildings in Utility and Miscellaneous Group U, Storage Group S, Factory Group F, High-Hazard Group H.
2. Additions less than 1,000 ft² (~~92~~ 93 m²) and less than 50 percent of existing floor area.
3. Additions that do not include the addition or replacement of equipment covered by Tables C403.3.2(1) through C403.3.2(16) or Section C404.2.
4. Additions that do not contain conditioned space.
5. Where the addition alone or the existing building and addition together comply with Section C407.

C502.3.7.1 Additions not served by heat pumps. The number of efficiency credits required by C502.3.7 shall be multiplied by 1.25 for the following:

1. Additions using purchased energy that is not electricity for space heating or service water heating,
2. Additions served by electric storage water heaters that are not heat pumps
3. Additions served by total heat pump space heating capacity less than the peak space heating load at heating design conditions calculated in accordance with Section C403.1.1

~~*Additions using purchased energy that is not electricity for space heating or service water heating, additions served by electric storage water heaters that are not heat pumps and additions served by total heat pump space heating capacity less than the peak space heating load at heating design conditions calculated in accordance with Section C403.1.1 shall comply with measures from Sections C406.2 and C406.3 to achieve not less than 67.5 percent of the number of required efficiency credits from Table C406.1.1 based on building occupancy group and climate zone. Where a project contains multiple occupancies, credits in Table C406.1.1 from each building occupancy shall be weighted by the gross conditioned floor area to determine the weighted average project energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of this section. Alterations to the existing building that are not part of an addition, but permitted with an addition, may shall be permitted to be used to achieve the required credits.*~~

Exceptions: Additions complying with all of the following:

1. ~~Buildings in Utility and Miscellaneous Group U, Storage Group S, Factory Group F, or High-Hazard Group H.~~

- ~~2. Additions less than 1,000 ft² (92 m²) and less than 50 percent of existing floor area.~~
- ~~3. Additions that do not include the addition or replacement of equipment covered by Tables C403.3.2(1) through C403.3.2(16) or Section C404.2.~~
- ~~4. Additions that do not contain conditioned space.~~
- ~~5. Where the addition alone or the existing building and addition together comply with Section C407.~~
- ~~6. Additions complying with all of the following:~~
 - ~~6.1. The addition's peak heating load calculated in accordance with Section C403.1.1 is greater than the addition's peak cooling load calculated in accordance with Section C403.1.1.~~
 - ~~6.2. The addition's total heat pump space heating capacity serving the addition is not less than 50 percent of the addition's space heating load at heating design conditions calculated in accordance with Section C403.1.1.~~
 - ~~6.3. Any energy source other than electricity or on-site renewable energy is used for space heating serving the addition only when a heat pump cannot provide the necessary heating energy to satisfy the thermostat setting.~~
 - ~~6.4. Electric resistance heat serving the addition is used only in accordance with Section C403.4.1.1.~~
- ~~7. Low energy buildings complying with Section C402.1.1.1.~~

Reason: This proposal modifies TABLE C406.1.1(2) Limit to Energy Efficiency Credit Carryover from Renewable and Load Management Credits to ensure that IECC 2024 has a pathway for minimum efficiency products in the event Sections C406.1.1.1 and C502.3.7.1 are not deleted.

In response to IECC Public Comment Draft Ballot #1 and #2, AHRI and its members, respectfully opposed the Proposed Revisions to Section C406.1.1.1 of the Energy Code, requiring new buildings using fossil fuels for space or water heating equipment, with certain exemptions, to increase the total energy credits required by 1.25. AHRI also opposed the additions to Section C502.3.7.1, requiring additions using fossil fuels for space or water heating equipment, with certain exemptions, to achieve 67.5 percent of the number of efficiency credits (a higher threshold than was proposed in Public Draft 1).

Increasing the base energy credits in TABLE C406.1.1(1) *Energy Credit Requirements by Building Occupancy Group* without appropriately increasing offsets in TABLE C406.1.1(2) *Limit to Energy Efficiency Credit Carryover from Renewable and Load Management Credits*, creates the same federal preemption problem that necessitated the creation of TABLE C406.1.1(2), in the first place (in CED1-190-22). This proposal rectifies the creation of a legally invalid code by increasing the surplus table to offset the impact of the 1.25x multiplier.

To establish values in this table, the spreadsheet created by Pacific Northwest National Laboratory (PNNL) during the development of CED1-190-22 was modified to calculate the impact of the 1.25 multiplier. The surplus credit table numbers were modified to ensure that energy efficiency credit requirements could be met without using higher efficiency Energy Policy Act-covered (EPACT) equipment. This methodology ensures a pathway for preempted equipment in the 2024 IECC – a critical legal requirement.

Details on AHRI's concerns with the creation of a legally invalid code created by CED1-18-22, were submitted in code proposal 1643. The calculation worksheet has been provided to ICC staff. Refer to the table starting on cell B96 (highlighted green) on the tab title "Carry-overCurrentPC-1.25x."

Additional supporting information posted at the following link <https://www.iccsafe.org/wp-content/uploads/Proposal-IECC-C-1726-supporting-documentation-ahri.xlsx>

Cost Impact:

The code change proposal will decrease the cost of construction.

This proposal will help offset the cost compliance for buildings which need fossil fuel space and/or water heating equipment.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

This proposal modifies TABLE C406.1.1(2) Limit to Energy Efficiency Credit Carryover from Renewable and Load Management Credits to ensure that IECC 2024 has a pathway for minimum efficiency products in the event Sections C406.1.1.1 and C502.3.7.1 are not deleted.

CE2D-57-23

IECC CE: C406.1.1.1

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C406.1.1.1 Buildings without heat pumps.

Buildings using purchased energy that is not electricity for space heating or service water heating, buildings with electric storage water heaters that are not heat pumps and buildings with total heat pump space heating capacity less than the space heating load at heating design conditions calculated in accordance with Section C403.1.1 shall comply with measures from C406.2 to achieve not less than 1.25 multiplied by the number of required efficiency credits from Table C406.1.1 based on building occupancy group and climate zone. Where a project contains multiple occupancies, credits in Table C406.1.1 from each building occupancy shall be multiplied by 1.25 and weighted by the gross conditioned floor area to determine the weighted average project energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of Section C406.

1. Portions of buildings devoted to manufacturing or industrial use.
2. Buildings complying with all of the following:
 - 2.1. Enter text
 - 2.2. The building's peak heating load calculated in accordance with Section C403.1.1 is greater than the building's peak cooling load calculated in accordance with Section C403.1.1.
 - 2.3. Any energy source other than electricity or on-site renewable energy is used for space heating only when a heat pump cannot provide the necessary heating energy to satisfy the thermostat setting.
 - 2.4. Electric resistance heat is used only in accordance with Section C403.4.1.1.
3. Low-energy buildings complying with Section C402.1.1.1.
4. Portions of buildings in Utility and Miscellaneous Group U, Storage Group S, Factory Group F, or High-Hazard Group H.
5. Buildings located in climate zones 0A, 0B, 1A, 1B, 2A and 2B.

Reason:

Heat pumps have a 5 to 10% lower cooling efficiency due to 4 way valve, accumulator and charge optimization losses and would actual result in increased energy in cooling dominated climates. Heat pumps should not be required in these climates for commercial buildings that are dominated by cooling.

Bibliography:

The economic models for credits were not shared by PNNL so we could not easily model the energy use, but some quick analysis we did shows that this will result in energy savings for commercial buildings.

Also it seems like the 1.25 should vary by climate zone and decrease in warmer climates.

Cost Impact:

The code change proposal will decrease the cost of construction.

This actual will be a cost reduction and an energy savings so payback will be instantaneous.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Additional heat pump credits in warm climate zones. Heat pump cooling efficiency are lower than AC efficiency. Detailed slide presentation. Requiring HPs in warm climates increases energy.

CE2D-58-23

IECC CE: C406.1.2

Proponents:

Jay Crandell, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2024 International Energy Code[CE Project] R3

Revise as follows:

C406.1.2 Additional renewable and load management credit requirements.

Buildings shall comply with measures from C406.3 to achieve not less than the number of required renewable and load management credits from Table C406.1.2 based on *building* occupancy group and *climate zone*. Where a project contains multiple occupancies, credits in Table C406.1.2 from each *building* occupancy shall be weighted by the gross floor area to determine the weighted average project energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of Section C406.

Exception: Where a *building* achieves more energy efficiency credits in Section C406.2 than are required in Section C406.1.1, the renewable and load management credits required in Table C406.1.2 shall be permitted to be reduced by the amount of surplus energy efficiency credits, ~~not to exceed a 30 percent reduction.~~

Reason Statement:

This proposal addresses two issues in the exception to Section C406.1.2: (1) to allow or permit reduction in required renewable and load management credits but not require it as currently written if there are surplus efficiency credits available, and (2) remove the limit on using excess efficiency credits to reduce the renewable and load management credit requirements. Energy efficiency or conservation of renewable and non-renewable primary energy sources is the back-bone of an energy conservation code. This is particularly so in an environment where transition to renewables and low-carbon energy sources is already occurring at a rapid pace due to other major policies that are focused on upstream energy sources rather than attempting to control them at the building project level. Also, use of renewable energy or load management measures does not reduce the net energy demand of the building so it is unclear how these credits can be considered on equivalent basis of energy efficiency credits. To the awareness of this proponent, there did not appear to be a rationale provided to justify inclusion of the 30 percent reduction limit.

ALTERNATE PROPOSAL: As an alternative solution, energy efficiency credits and renewable/load management credits should be treated separately (delete the exception in C406.1.2 and exception 2 in C406.1.1). Coordinating changes should be considered for Appendices CD and CF as well.

Cost Impact:

The code change proposal will decrease the cost of construction.

By adding additional flexibility in the use of surplus energy efficiency credits to offset required credits for renewables and load management, this should tend to reduce cost by providing the user with more options to satisfy the requirements of Section C406.

CE2D-58-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

This proposal removes the 30% limitation on renewable and load management credits. Removing the 30% limitation provides flexibility in achieving credit compliance, and a clear rationale was not presented for the 30% reduction.

CE2D-61-23

IECC CE: C406.2, C406.2.2.1

Proponents:

Michael Tillou, representing Pacific Northwest National Lab (michael.tillou@pnnl.gov)

2024 International Energy Code[CE Project] R3

Revise as follows:

C406.2 Additional Energy Efficiency Credits Achieved.

Each energy efficiency credit measure used to meet credit requirements for the project shall have efficiency that is greater than the requirements in Sections C402 through C405. Measures installed in the project that meet the requirements in Sections C406.2.1 through C406.2.7 shall achieve the base credits listed for the measure and occupancy type in Tables C406.2(1) through C406.2(9) or, where calculations required by Sections C406.2.1 through C406.2.7 create or modify the table credits, the credits achieved shall be based upon the calculations. Energy credits achieved for measures shall be determined by one of the following, as applicable:

1. The measure's energy credit shall be the base energy credit from Tables C406.2(1) through C406.2(9) for the measure where no adjustment factor or calculation is included in the description of the measure in Section C406.2.
2. The measure's energy credit shall be the base energy credit for the measure adjusted by a factor or equation as stated in the description of the measure in Section C406.2. Where adjustments are applied, each measure's energy credit shall be rounded to the nearest whole number.
3. The measure's energy credit shall be calculation as stated in the measures description in Section C406.2, where each individual measure credit shall be rounded to the nearest whole number.

Energy credits achieved for the project shall be the sum of the individual measure's energy credits. Credits are available for the measures listed in this Section. Where a project contains multiple *building* occupancy groups:

1. Credits achieved for each occupancy group shall be summed and then weighted by the *conditioned floor area* of each occupancy group to determine the weighted average project energy credits achieved.
2. Improved envelope efficiency (E01 through E06), HVAC Performance (H01), and lighting reduction (L06) measure credits shall be determined for the *building* or permitted *conditioned floor area* as a whole. Credits for other measures shall be determined for each occupancy separately. Credits shall be taken from applicable tables or calculations for each occupancy and weighted by the *building* occupancy group floor area.

C406.2.2.1 H01 HVAC Performance (TSPR).

H01 energy credits shall be earned where systems are permitted to use Section C409 and where the savings (TSPRs) based on the proposed TSPR (TSPRp) compared to the target exceeds the minimum TSPR (TSPRt) requirement is 5 percent or more. If improvement savings is greater than 5 percent, determine H01 earned credits using Equation 4-14. Energy credits for H01 shall not be combined with energy credits from HVAC measures H02, H03 or H05.

$$EC_{TSPR} = EC_{BASE} \times \frac{TSPR_a \times AREA_{TSPR} \times TSPR_s}{TSPR_p} / 0.05$$

(Equation 4-14)

where:

EC_{TSPR} = Energy credits achieved for H01

EC_{BASE} = H01 base energy credits from Tables C406.2(1) through C406.2(9)

$TSPR_s = \frac{TSPR_a}{TSPR_p} \times [the\ lessor\ of\ 0.20\ and\ (1 - (TSPR_t / TSPR_p))]$

$TSPR_a \times AREA_{TSPR} = [floor\ area\ served\ by\ systems\ permitted\ to\ use\ included\ in\ TSPR] / [total\ building\ conditioned\ floor\ area]$

$TSPR_p$ = HVAC TSPR of the proposed design calculated in accordance with Sections C409.4, C409.5 and C409.6.

$TSPR_t = TSPR_r / MPF$

$TSPR_r$ = HVAC TSPR of the reference *building* design calculated in accordance with Sections C409.4, C409.5 and C409.6.

MPF = Mechanical Performance Factor from Table C409.4 based on *climate zone* and *building* use type

Where a *building* has multiple *building* use types, MPF shall be area weighted in accordance with Section C409.4

Reason:

Review and testing of the formula for TSPRs found three issues that this proposal corrects:

1. The subscript TSPRx is incorrect and changed to TSPRs for TSPRsavings
2. TSPRp and TSPRt were reversed in the formula for TSPRs resulting in a negative result and a fraction representing improvement in TSPR rather than the savings indicated by the improvement in TSPR. The corrected core formula for TSPRsavings is: $1 - (TSPR_t / TSPR_p)$

As an example, for a typical improvement case, the current TSPRs formula would return -12.6% savings when the TSPR improvement was 12.6%, and the actual savings in site energy use was 11.2%. The corrected formula returns 11.2%.

3. The adjustment for building area included in the TSPR calculation ($TSPR_a$) was moved to the main formula so that TSPRs can be properly referenced to be in the range of 0.05 to 0.20 for setting measure eligibility limits.

Two symbols were added for the base and earned energy credits to match the format of other measure adjustment formulas.

In addition, charging language was clarified to indicate the minimum 5% is a savings from TSPR improvement rather than the TSPR improvement itself. Also, the mixed-use section was modified to include measure H01 with those measures that are calculated for the project as a whole.

NOTE: CDPaccess did not retain strikeout and underline for many of the proposed corrections, a file is attached that shows all the proposed changes from the second round IECC posting.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

There is no cost impact from this correction to match the intended 5% savings basis for measure H01.

Attached Files

- **H01-edit-IECC24-proposal-1666.pdf**
<https://energy.cdpassess.com/proposal/1666/3833/files/download/530/>
-

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Change the TSPRa to AREAspr. Not substantive. Simple change in two places. Does not affect the stringency.

CE2D-64-23

IECC CE: C406.2.5.5

Proponents:

Jack Bailey, representing INTERNATIONAL ASSOCIATION OF LIGHTING DESIGNERS
(jbailey@oneluxstudio.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C406.2.5.5 L05 Residential light control.

In *buildings* with Group R-2 occupancy spaces, interior lighting systems shall comply with the following:

1. In common area, the following space types shall have occupant sensor controls that comply with the requirements of Section C405.2.1.1 :

- 1.1. Laundry/washing areas,
- 1.2. Dining areas,
- 1.3. Food preparation areas,
- 1.4. Seating areas,
- 1.5. Exercise areas,
- 1.6. Massage spaces

2. In dwelling units, not less than one receptacle in each living room and each sleeping room shall be controlled by a switch in that room.

3. ~~Each *dwelling unit* shall have a switch by the main entrance that turns off all the lighting and all switched receptacles in the *dwelling unit*.~~ Lights and switched receptacles in bathrooms and kitchens shall be controlled by an occupant sensor complying with Section C405.2.1.1. All other lights and switched receptacles in each dwelling unit shall be controlled by a switch at the main entrance. The switch shall be clearly labeled/marked to indicate its function.

Exception: Lighting and switched receptacles controlled by an occupant sensor complying with Section C405.2.1.1 are not required to be controlled by the switch at the main entrance.

Reason:

Legitimate safety concerns were raised during the consensus committee hearing related to elderly or disabled people being unable to safely find their way to the main switch in the event that someone else inadvertently shut the lights off on them. Equivalent energy savings will be achieved through the use of occupant sensors, while eliminating the safety concern.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

An occupant sensor is more expensive than a switch, but providing one is optional.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Legitimate safety concerns were raised during the consensus committee hearing related to elderly or disabled people being unable to safely find their way to the main switch in the event that someone else inadvertently shut the lights off on them. Equivalent energy savings will be achieved through the use of occupant sensors, while eliminating the safety concern.

CE2D-66-23

IECC CE: C408.3.1.4, C408.3.1.5

Proponents:

Harold Jepsen, representing Legrand (harold.jepsen@legrand.us)

2024 International Energy Code[CE Project] R3

Revise as follows:

C408.3.1.4 High-end trim controls.

Where lighting controls are configured for *high-end trim*, verify the following:

1. High-end *trim* maximum level has been set.
2. The calibration adjustment equipment is located for *ready access* only by authorized personnel.
3. Lighting controls with *ready access* for users cannot increase the lighting power above the maximum level established by the *high-end trim* controls.

C408.3.1.5 High end trim lighting control verification for Additional Efficiency Credit L02.

For the qualifying spaces associated with the project receiving additional efficiency credits in Section C406.2.5.2, the following shall be documented while daylight responsive controls are not reducing lighting power:

1. The maximum setting for power or light output for each control group of *general lighting* luminaires.
2. The *high-end trim* setting for power or light output for each control group of *general lighting* luminaires.
3. For projects with seven or fewer claimed qualifying spaces, the reduction in light ~~output level~~ or reduction in power due to *high-end trim* shall be tested in all spaces and shown to reduce the *general lighting* power or light ~~output level~~ to not greater than 85 percent of full power or light output. For projects with more than seven claimed qualifying spaces, the reduction in light ~~output level~~ or reduction in power due to *high-end trim* shall be tested in not less than 10 percent of spaces, and no less than seven spaces, and shown to reduce *general lighting* power or light ~~output level~~ to not greater than 85 percent of full power or light output. Where more than 30 percent of the tested spaces fail, the remaining qualifying spaces shall be tested.
4. Summarize the reduction in *general lighting* power or light output resulting from the *high-end trim* setting for each qualifying space and the floor area of each qualifying space.
5. Summarize the fraction of total floor area for spaces where *high-end trim* reduces *general lighting* power or light output to not greater than 85 percent of full power or light output.

Reason:

Some of these shown changes are to restore language from PC Proposal CECD1-4-22, which were left out of the PC DRAFT1 version.

Other changes are editorial to provide greater clarity to the requirements. These changes align language with defined terms, and identifies lighting output reduction as a method to verify functional operation as already identified in three earlier sections of this section. The stringency, intent or application of the code is not altered with these changes.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

These changes are to correct proposal language which was left out of the PC Draft1 version as well as for editorial and clarity reasons.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Provides clarity for functional testing of high-end trim lighting controls.

CE2D-67-23

IECC CE: C408.3.1.6

Proponents:

Harold Jepsen, representing Legrand (harold.jepsen@legrand.us)

2024 International Energy Code[CE Project] R3

Revise as follows:

C408.3.1.6 Demand responsive lighting controls G01.

For spaces associated with the project receiving Renewable and Load Management Credits in Section C406.3.2, the following procedures shall be performed:

1.	Confirm the maximum set point upon receipt of the <i>demand response signal</i> has been established for each space.										
2.	For projects with seven or fewer spaces rooms -with controls, each space room shall be tested.										
3.	For projects with more than seven spaces rooms -with controls, testing shall be done for each unique space type. Where multiple spaces rooms of each space type exist, not less than 10 percent and in no case fewer than one space room , of each space type shall be tested unless the <i>code official</i> requires a higher percentage to be tested. Where 30 percent or more of the tested controls fail in a space type, all remaining identical space types shall be tested.										
4.	For demand responsive controls to be tested, verify the following: <table border="1"><tr><td>4.1</td><td>Where <i>high-end trim</i> controls are used, the <i>high-end trim</i> shall be set before testing.</td></tr><tr><td>4.2</td><td>Turn off all non-<i>general lighting</i> in the space room.</td></tr><tr><td>4.3</td><td>Set <i>general lighting</i> to its maximum illumination level. Where <i>high-end trim</i> is set, this will be the maximum illumination level at the <i>high-end trim</i> setpoint.</td></tr><tr><td>4.4</td><td>An illumination measurement shall be taken in an area of the space room-not controlled by daylight responsive controlled lighting. If there is not an area without daylight responsive controls the daylight responsive controls shall be overridden from reducing the lighting level during the test.</td></tr><tr><td>4.5</td><td>Measure and document the space room-maximum illumination level.</td></tr></table>	4.1	Where <i>high-end trim</i> controls are used, the <i>high-end trim</i> shall be set before testing.	4.2	Turn off all non- <i>general lighting</i> in the space room .	4.3	Set <i>general lighting</i> to its maximum illumination level. Where <i>high-end trim</i> is set, this will be the maximum illumination level at the <i>high-end trim</i> setpoint.	4.4	An illumination measurement shall be taken in an area of the space room -not controlled by daylight responsive controlled lighting. If there is not an area without daylight responsive controls the daylight responsive controls shall be overridden from reducing the lighting level during the test.	4.5	Measure and document the space room -maximum illumination level.
4.1	Where <i>high-end trim</i> controls are used, the <i>high-end trim</i> shall be set before testing.										
4.2	Turn off all non- <i>general lighting</i> in the space room .										
4.3	Set <i>general lighting</i> to its maximum illumination level. Where <i>high-end trim</i> is set, this will be the maximum illumination level at the <i>high-end trim</i> setpoint.										
4.4	An illumination measurement shall be taken in an area of the space room -not controlled by daylight responsive controlled lighting. If there is not an area without daylight responsive controls the daylight responsive controls shall be overridden from reducing the lighting level during the test.										
4.5	Measure and document the space room -maximum illumination level.										
5.	Simulate a <i>demand response signal</i> and measure the illumination level at the same location as for the measurement in C408.3.1.5.(4.5). Verify the illumination level has been reduced to no greater than 80 percent of the maximum illumination level documented in C408.3.1.5.(4.5).										
6.	Simulate the end of a demand event by turning off the <i>demand response signal</i> , confirm controls automatically return to their normal operational settings at the end of the demand response event.										

Reason Statement:

These changes are editorial to provide greater clarity to the requirements by changing the term "room" for that of "space". Using the term space is consistent with other functional testing requirements in this section. The stringency, intent or application of the code is not altered with these changes.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

These changes are editorial and for greater clarity.

CE2D-67-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Provides clarity for functional testing of demand responsive controls within a space.

CE2D-69-23

IECC CE: C503.2.1

Proponents:

Glen Clapper, representing National Roofing Contractors Association (gclapper@nrca.net)

2024 International Energy Code[CE Project] R3

Revise as follows:

C503.2.1 Roof, ceiling, and attic alterations.

Insulation complying with Section C402.1 and Section C402.2.1, or an *approved* design that minimizes deviation from the insulation requirements, shall be provided for the following alterations:

1.	An <i>alteration</i> of roof-ceiling construction other than reroofing where existing insulation located below the roof deck or on an attic floor above <i>conditioned space</i> does not comply with Table C402.1.2.				
2.	<p><i>Roof replacement</i> or a roof <i>alteration</i> that includes removing and replacing the <i>roof covering</i>, where the <i>roof assembly</i> includes insulation entirely above the <i>roof deck</i>.</p> <p>Exceptions: Where compliance with Section C402.1 cannot be met due to limiting conditions on an existing roof, an <i>approved</i> design shall be submitted with the following:</p> <table border="1"><tr><td>1.</td><td><i>Construction documents</i> that include a report by a <i>registered design professional</i> or an <i>approved third-party source</i> documenting details of the limiting conditions affecting compliance with the insulation requirements.</td></tr><tr><td>2.</td><td><i>Construction documents</i> that include a roof design by a <i>registered design professional</i> or an <i>approved third-party source</i> that minimizes deviation from the insulation requirements.</td></tr></table>	1.	<i>Construction documents</i> that include a report by a <i>registered design professional</i> or an <i>approved third-party source</i> documenting details of the limiting conditions affecting compliance with the insulation requirements.	2.	<i>Construction documents</i> that include a roof design by a <i>registered design professional</i> or an <i>approved third-party source</i> that minimizes deviation from the insulation requirements.
1.	<i>Construction documents</i> that include a report by a <i>registered design professional</i> or an <i>approved third-party source</i> documenting details of the limiting conditions affecting compliance with the insulation requirements.				
2.	<i>Construction documents</i> that include a roof design by a <i>registered design professional</i> or an <i>approved third-party source</i> that minimizes deviation from the insulation requirements.				
3.	Conversion of unconditioned attic space into <i>conditioned space</i> .				
4.	Replacement of ceiling finishes exposing cavities or surfaces of the roof-ceiling construction.				

Reason Statement:

This proposal restores the newly (2024) defined term, approved as modified in the first Public Input Initial Draft. The use of a defined term versus an undefined term reduces a potential conflict for the building/code official with regard to the entity providing the required information.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This proposal will neither increase nor decrease the cost of construction.

CE2D-69-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
revising the terminology used provides consistency with residential code.

CE2D-70-23

IECC CE: C503.5.1

Proponents:

Shane Hoeper, representing SEHPCAC

2024 International Energy Code[CE Project] R3

Revise as follows:

C503.5.1 Interior lighting and controls.

Alterations to interior spaces, lighting, or controls shall comply with the following:

1.	Where an alteration the area of an interior spaces is altered, those spaces <u>space includes the addition or relocation of full height partitions, the space</u> shall comply with the lighting power requirements of Section Sections C405.2, C405.3 and C408.3. these spaces shall comply with the lighting control requirements of Sections C405.2 and C408.3.
2.	Where the lighting within interior spaces is altered, those spaces shall comply with the lighting power requirements of Sections C405.2, C405.3 and C408.3. these spaces shall comply with the lighting control requirements of C405.2 and C408.3.
3.	Where the lighting controls within interior spaces are altered, those spaces shall comply with the lighting control requirements of Sections C405.2 and C408.3.

Exception: Compliance with Section C405.2.98 is not required for alterations.

Reason Statement:

These recommended revisions are mainly editorial in nature to add clarity, conciseness, and enforceability to the section.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

These changes do not impact the cost effectiveness nor the original technical merit or intent of the requirement.

CE2D-70-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
Proposal clarifies what constitutes an alteration in space area.

CE2D-71-23

IECC CE: C503.5.2

Proponents:

Shane Hoeper, representing SEHPCAC

2024 International Energy Code[CE Project] R3

Revise as follows:

C503.5.2 Exterior lighting and controls.

Alterations to exterior lighting and controls shall comply with the following:

1.	Where the connected exterior lighting power is increased by more than 400 Watts, all exterior lighting, including lighting which is not proposed to be altered, shall comply with lighting power requirements of Section C405.5.
2.	Where the combined power of added and replacement luminaires is more than 400 Watts, all lighting which is added or altered shall be controlled in accordance with Sections C405.2 and C408.3. Exception: Individual luminaires less than 50 Watts which provided they pass functional tests verifying that lights are automatically <u>automatic</u> shut off where daylight is present.
3.	Where <u>portions of</u> exterior lighting controls are added or altered, those portions of the lighting control system which are added or altered shall comply with Sections C405.2 and C408.3.

Reason Statement:

These recommended revisions are mainly editorial in nature to add clarity, conciseness, and enforceability to the section. These changes do not impact the cost effectiveness nor the original technical merit or intent of the requirement.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

These changes do not impact the cost effectiveness nor the original technical merit or intent of the requirement.

CE2D-71-23

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

These recommended revisions are mainly editorial in nature to add clarity, conciseness, and enforceability to the section. These changes do not impact the cost effectiveness nor the original technical merit or intent of the requirement.

CE2D-75-23

IECC CE: CG103.2.6

Proponents:

Jennifer Kane, representing Trane Technologies

2024 International Energy Code[CE Project] R3

Revise as follows:

CG103.2.6 Pre-heating of outdoor air.

Hydronic systems without energy recovery ventilation and that do not use freeze protection fluids shall be permitted to utilize electric resistance to temper air to not more than 40°F (4.5°C). All systems ~~Systems~~ with energy recovery ventilation shall be permitted to utilize electric resistance to preheat outdoor air for defrost or temper air entering the energy recovery device and shall comply with one of the following:- ~~The electric resistance used to preheat outdoor air for the energy recovery device shall not preheat outdoor air greater than 5F; if the space is mechanically humidified or has a process application that will maintain the space above 30% relative humidity, the preheat may not preheat outdoor air greater than 25F. The electric resistance used to preheat outdoor air for heating only applications with sensible heat recover exchangers shall not preheat air greater than 25F.~~

1. When the space is mechanically humidified or has a process application that will maintain the space above 30 percent relative humidity when the outdoor temperature is not greater than 25°F (-4°C) and the system recovers latent energy, the outdoor air shall not be preheated to greater than 25°F (-4°C);

2. For sensible-only heat recovery exchangers, outdoor air shall not be preheated to greater than 25°F (-4°C);

3. For all other systems, outdoor air shall not be preheated outdoor air to greater than 5°F (-15°C).

Reason:

See attachment.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

See attachment.

Attached Files

- **Trane Technologies Comments on IECC Electrification Appendix.pdf**
<https://energy.cdpass.com/proposal/1746/3837/files/download/546/>

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason: it ensures excessive electric resistance energy is not applied when energy recovery devices are employed.

CE2D-76-23

IECC CE: ASTM Chapter 06

Proponents:

Theresa Weston, representing Air Barrier Association of America (ABAA) (holtweston88@gmail.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

ASTM	ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken PA 19428-2959
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E283/E283M-2019):	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
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ASTM	ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken PA 19428-2959
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E1186- 2022	Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems
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ASTM	ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken PA 19428-2959
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E2357— 2022 3:	Standard Test Method for Determining Air Leakage of Air Barriers Assemblies
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ASTM	ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken PA 19428-2959
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E3158-2019 8 :	Test Method for Measuring the Air Leakage Rate of a Large or Multizone Building
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Reason Statement:

This proposal is eratta. It corrects the dates on referenced standards.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This corrects errata in the noted dates of reference standards. It makes no technical changes.

CE2D-76-23

Workgroup Recommendation
Commercial Energy Committee Action: As Submitted
Commercial Energy Committee Reason:
Corrects reference year on standards.

CE2D-77-23

IECC CE: SECTION C404; IECC RE: TABLE C404.10 (New); IECC CE: AHRI Chapter 06 (New)

Proponents:

Bryan Ahee, representing Bradford White Corporation (bahee@bradfordwhite.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C404.10 Demand responsive water heating..

Electric storage water heaters with a rated water storage volume of 40 gallons (150L) to 120 gallons (450L) and a nameplate input rating equal to or less than 12kW shall be provided with demand responsive controls in accordance with Table C404.10 ~~or another equivalent approved standard.~~

Exceptions:

1. Water heaters that provide a hot water delivery temperature of 180°F (82°C) or greater.
2. Water heaters that comply with Section IV, Part HLW or Section X of the ASME Boiler and Pressure Vessel Code.
3. Water heaters that use 3-phase electric power.

2024 International Energy Code [RE] [RE Project] R3

Revise as follows:

TABLE C404.10 DEMAND RESPONSIVE CONTROLS FOR WATER HEATING

Equipment Type	Controls	
-	Manufactured before 7/1/2025	Manufactured on or after 7/1/2025
Electric storage water heaters	<u>AHRI Standard 1430</u> or ANSI/CTA-2045-B Level 1 and also capable of initiating water heating to meet the temperature set point in response to a demand response signal.	<u>AHRI Standard 1430</u> ANSI/CTA-2045-B Level 2, except "Price Stream Communication" functionality as defined in the standard.

2024 International Energy Code[CE Project] R3

Add new standard(s) as follows:

AHRI	Air-Conditioning, Heating, & Refrigeration Institute 2111 2311 Wilson Blvd, Suite 500 400 Arlington VA 22201
<u>1430</u>	<u>AHRI 1430 (I-P): Demand Flexible Electric Storage Water Heaters</u>

Reason:

AHRI 1430 has been published, this standard was intended to replace the language 'or another equivalent approved standard' in section C404.10, which was a placeholder while AHRI 1430 was finalized. This will align the demand response language with the residential code R403.5.5 and Table R403.5.5 which already reflect these changes.

Bibliography:

AHRI

AHRI Standard 1430-2022 (I-P) Demand Flexible Electric Storage Water Heaters
2111 Wilson Blvd, Suite 500
Arlington, VA 22201

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This standard applies to communication, infrastructure, and system functionality as these relate to the implementation of energy management strategies for demand flexible water heaters (DFWH) and will neither increase nor decrease the cost of construction.

Attached Files

- **Commercial Demand Response Water Heating update.pdf**
<https://energy.cdpassess.com/proposal/1595/3838/files/download/545/>
-

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

It is to incorporate AHRI 1430 and align with IECC residential.

CE2D-78-23 Part I

IECC CE: NEMA (New)

Proponents:

Bryan Holland representing NEMA

2024 International Energy Code[CE Project] R3

Add new text as follows:

NEMA 1300 North 17th Street, Suite 900, Rosslyn, VA 22209.

OS 4-2016 Requirements for Air-Sealed Boxes for Electrical and Communication Applications

CE2D-78-23 Part I

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Provides the needed reference standard.

CE2D-95-23 Part I

IECC CE: CG103.2.5.1

Proponents:

Aaron Phillips, representing Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Energy Code[CE Project] R3

Revise as follows:

CG103.2.5.1 Low indoor design conditions.

Space heating systems sized for spaces with indoor design conditions of not greater than 40°F (4.5°C) and intended for freeze protection, including temporary systems in unfinished spaces, shall be permitted to use electric resistance. The building thermal envelope ~~building envelope~~ of any such space shall be insulated in compliance with Section C402.1.

CE2D-95-23-23 Part I

Workgroup Recommendation

Commercial Energy Committee Action: As Submitted

Commercial Energy Committee Reason:

Changes building envelope to building thermal envelope to be consistent within the document.

CEC2D-1-23

IECC CE: C403.4.6

Proponents:

Richard Lord, representing Carrier Corporation (richard.lord@carrier.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

C403.4.6 Demand responsive controls.

Also add the requirements to C403.4.1.1 for thermostat dead band and setpoints. Electric heating and cooling systems shall be provided with demand responsive controls capable of executing the following actions in response to a *demand response signal*:

1. Automatically increasing the *zone* operating cooling set point by the following values: 1°F (0.5°C), 2°F (1°C), 3°F (1.5°C), and 4°F (2°C).
2. Automatically decreasing the *zone* operating heating set point by the following values: 1°F (0.5°C), 2°F (1°C), 3°F (1.5°C), and 4°F (2°C).

Where a *demand response signal* is not available the heating and cooling system controls shall be capable of performing all other functions. Where thermostats are controlled by direct digital control including, but not limited to, an energy management system, the system shall be capable of *demand responsive control* and capable of adjusting all thermal set-points to comply. The demand responsive controls shall comply with either Section C403.4.6.1 or Section C403.4.6.2

Exceptions:

1. Group I occupancies
2. Group H occupancies
3. Controls serving *data center* systems
4. Occupancies or applications requiring precision in indoor temperature control as *approved* by the *code official*
5. . Buildings that comply with Load Management measure G02 in Section C406.3.3
6. Buildings with energy storage with the capacity for not less than a 25 percent load reduction at peak load for a period of not less than 3 hours.

Reason:

The requirements to thru demand limiting will result in a setup of cooling to a higher temperature to turn on heat and the setback for heating operation could turn on cooling for building thermostats that have a single setpoint which we have found is commonly used in Hotels and some commercial buildings. The proposed text is pulled from a new ASHRAE 90.1 addendum

Also with electrification buildings may have cooling and heating thermal storage which could be used for demand limiting without resulting in comfort problems. We have proposed adding an exception for buildings with thermal storage.

Bibliography:

This change has been proposed for ASHRAE 90.1 and has been thru public review.

Cost Impact:

The code change proposal will increase the cost of construction.

The Capability Exists in Most Thermostats and Control Systems. Most modern controllers already have dual set points since the dead band capability has been a requirement of Standard 90.1 since 1989. And many already have displays that meet the new requirements. Direct digital control systems generally have configurable displays that can be readily modified to meet the proposed requirements. So the primary first cost impact will be to modify the displays of non-DDC (firmware) thermostats, but these are low-cost thermostats to begin with and also the thermostats that this addendum is targeting. The energy savings will more than cover the small first cost in just a few years of demand control.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Encourages the use of thermal energy storage by providing an additional technology option for reducing demand.

CEC2D-3-23

IECC CE: SECTION C202

Proponents:

Glenn Heinmiller, representing International Association of Lighting Designers (glenn@lampartners.com)

2024 International Energy Code[CE Project] R3

Revise as follows:

SECTION C202 GENERAL DEFINITIONS.

CONGREGATE LIVING FACILITIES. A building or part thereof that contains *sleeping units* where residents share bathroom or kitchen facilities, or both.

Reason:

Congregate living facilities is a defined term from the IBC that is now used in the IECC.

C405.2.10.2 uses the term *congregate living facilities* and it is italicized, but it cannot be found in C202.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

adds a definition

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

for clarity on what are congregate living facilities.

CEC2D-4-23 Part I

IECC CE: SECTION C110, SECTION C110 (New)

Proponents:

Duane Jonlin, representing IECC Commercial committee

2024 International Energy Code[CE Project] R3

Revise as follows:

SECTION ~~C110~~C109 — MEANS OF APPEALS

SECTION ~~C109~~C110 — STOP WORK ORDER

Reason:

Editorial change to align ordering of Chapter 1 sections with other I-Codes

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Editorial change

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Consistent with other I-Codes.

CEC2D-6-23

IECC CE: C403.4.1.2 (New), C403.4.1.3 (New), C403.4.1.4 (New)

Proponents:

Blake Shelide, representing IECC CE HVACR & Water Heating Subcommittee (ieccccehvacr@iccsafe.org)

2024 International Energy Code[CE Project] R3

Revise as follows:

C403.4.1.2 Deadband.

Where used to control both heating and cooling, zone thermostatic controls shall: ~~be configured to provide a temperature range or deadband of not less than 5°F (2.8°C) within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.~~

1. Have separate set points for heating and cooling, each individually adjustable.
2. Be capable of and initially configured to provide a temperature range or dead band between the two set points of not less than 5°F (3°C) within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum, and
3. Have a minimum dead band of not less than 1°F (0.5°C) when set points are adjusted.

Exceptions:

- ~~1. Thermostats that require~~ requiring manual changeover between heating and cooling modes.
- ~~2. Occupancies or applications where applicable codes or accreditation standards~~ requiring precision in indoor temperature control as approved by the code official shall be permitted to be initially configured to not less than 1°F (0.5°C) deadband.

Add new text as follows:

C403.4.1.3 Set point adjustment and display.

Where thermostatic control set points are capable of being adjusted by occupants or HVAC system operators, the adjustment shall be independent for the heating set point and the cooling set point; when one set point is changed, the other shall not change except as needed to maintain the minimum dead band required by Section C404.4.1.2. For thermostatic controls that display set points, both the heating and cooling set points shall be displayed simultaneously, or the set point of the currently active mode (heating or cooling) shall be displayed along with an indication of that mode.

Revise as follows:

C403.4.1.34 Set point overlap restriction.

Where heating and cooling to a zone are controlled by ~~has a separate heating and a separate cooling zone~~ thermostatic controls located within the zone, mechanical or software means shall be provided a limit switch, mechanical stop or direct digital control system with software programming shall be configured to prevent the heating setpoint from exceeding the cooling setpoint, minus the deadband required by ~~and to maintain a deadband in accordance with~~ Section C403.3.4.1.

Reason:

The requirements to thru demand limiting will result in a setup of cooling to a higher temperature to turn on heat. The setback for heating operation could turn on cooling for building thermostats that have a single setpoint, which we have found is commonly used in Hotels and some commercial buildings. The proposed text is pulled from a new ASHRAE 90.1 addendum

Also with electrification, buildings may have cooling and heating thermal storage, which could be used for demand limiting without

resulting in comfort problems. We have proposed adding an exception for buildings with thermal storage.

Bibliography:

This change is the same as addendum c to ASHRAE 90.1-2022.

Cost Impact:

The code change proposal will increase the cost of construction.

The code change proposal will increase the cost of construction.

The capability exists in most thermostats and control systems. Most modern controllers already have dual set points since the dead band capability has been a requirement of Standard 90.1 since 1989. And many already have displays that meet the new requirements. Direct digital control systems generally have configurable displays that can be readily modified to meet the proposed requirements. So the primary first cost impact will be to modify the displays of non-DDC (firmware) thermostats, but these are low-cost thermostats to begin with and also the thermostats that this addendum is targeting. The energy savings will more than cover the small first cost in just a few years of demand control.

Workgroup Recommendation

Commercial Energy Committee Action: As Modified

Commercial Energy Committee Reason:

Changes proposed will align with ASHRAE 90.1-2025.