International Energy Conservation Code Consensus Committee-Commercial

Meeting Agenda (Draft 1/18/23)

January 25, 2023
2:00 PM Eastern to 5:00 PM Eastern (3 hours)
Webex Link

Committee Chair: Duane Jonlin
Committee Vice Chair: Emily Hoffman

1. Call to order.

2. Meeting Conduct. Staff
    a. Identification of Representation/Conflict of Interest
    b. ICC Council Policy 7 Committees: Section 5.1.10 Representation of Interests
    c. ICC Code of Ethics: ICC advocates commitment to a standard of professional behavior that exemplifies the highest ideals and principles of ethical conduct which include integrity, honesty, and fairness. As part of this commitment it is expected that participants shall act with courtesy, competence and respect for others.
    d. ICC Antitrust Compliance Guideline

3. Roll Call – Hoffman

4. Approval of Agenda

5. Approval of Minutes from January 11, 2023

6. Administrative issues.

7. Action Items.
    a. Public Comment Draft 1 Proposals

CED1-7-22(Construction Documents definition)	Admin disapprove 9-0-1
CED1-8-22(Equipment building criteria)	Admin disapprove 8-0-1
CED1-12-22(C505.1 reference)	Admin approve 8-0-1
CED1-13-22(ASHRAE 140 reference)	Admin approve 8-0-1
CED1-30-22(Scope of energy monitoring)	Elect as modified 5-3-4
CED1-33-22(Scope of energy monitoring)	Elect disapprove 10-5-2
CED1-34-22(Energy monitoring all energy forms)	Elect disapprove 8-1-2
CED1-35-22(Energy monitoring energy forms)	Elect disapprove 8-0-4
CED1-36-22(EV monitoring update)	Elect approve 9-2-2
CED1-37-22(EV energy monitoring removal)	Elect disapprove 7-3-2
CED1-90-22(Project specific fenestration size)	Envelope as modified 13-0-2
CED1-126-22(Fenestration U-factors)	Envelope approve 13-0-1
CED1-127-22(Orientation)	Envelope as modified 7-6-3

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CED1-141-22(Automated window shading)	Envelope as modified 14-0-1
CED1-125-22(Multi-family window alignment)	Envelope disapprove 13-1-3
CED1-129-22(Air barrier exception)	Envelope disapprove 8-4-1
CED1-130-22(Air barrier construction language)	Envelope approve 7-4-2
CED1-131-22(Air leakage compliance)	Envelope approve 14-0-1
CED1-133-22(Whole building test method except)	Envelope disapprove 12-0-1
CED1-185-22(C406 editorial update)	Env as modified 10-1-0/Modeling as mod 14-0-1
CED1-190-22(C406 Energy Credit carryover)	Modeling as modified 7-1-2(mod)-2(abstain)
CED1-189-22(Energy credit requirement)	Modeling as modified 10-1-1
CED1-193-22(Add.efficiency renew load manage)	Modeling disapprove 10-2-1
CED1-182-22(Thermal block definition)	Modeling as modified 12-0-1
CED1-195-22(Vertical fenestration energy credit)	Modeling as modified 8-2-1

8. Subcommittee Reports

9. Other business.
   a. Public comment on any matters discussed at the meeting (Please limit comments to 2 minutes. Further comments can be directed to the Secretariat following the meeting to be considered at a future meeting.)

10. Next meeting Wednesday, February 8, 2023 at 2:00 pm Eastern

11. Adjourn.

FOR FURTHER INFORMATION BE SURE TO VISIT THE ICC WEBSITE:
IECC Commercial Consensus Committee Webpage
https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/iecc-commercial-consensus-committee/
ICC Energy webpage
https://www.iccsafe.org/products-and-services/codes-standards/energy/
Code Change Proposal Submittals
https://energy.cdpaccess.com/login/

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

Kristopher Stenger, AIA, Director of Energy Programs
International Code Council
kstenger@iccsafe.org

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-007-22 Construction Documents definition
CDP ID #	718
Code	IECC CE
Code Section(s)	C202
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC review
Subcommittee	CE Admin
Subcommittee Notes	
Recommendation	Reason Statement: To keep defintion in the IECC-C consistent with the other family of I-Codes and ASHRAE 189.1.
Vote	Disapproved 9-0-1
Recommendation Date	12/20/2022
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-008-22 Equipment building criteria
CDP ID #	852
Code	IECC CE
Code Section(s)	C402.1.1.3
Location	base
Proponent	Daniel Carroll daniel.carroll@dos.ny.gov
Proposal Status	SC review
Subcommittee	CE Admin
Subcommittee Notes	It was noted that technical and editorial revisions are needed in the five list items. The committee recommends the Envelope Subcommittee consider review of these list items.
Recommendation	Reason Statement: To ensure consistency in charging language used throughout the code when all provisions must be met.
Vote	Disapproved 8-0-1
Recommendation Date	12/20/2022
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-012-22 C505.1 reference
CDP ID #	806
Code	IECC CE
Code Section(s)	C505.1
Location	base
Proponent	Daniel Carroll daniel.carroll@dos.ny.gov
Proposal Status	SC review
Subcommittee	CE Admin
Subcommittee Notes	
Recommendation	Reason Statement: To correct pointer to the applicable section required for compliance.
Vote	Approved as Submitted 8-0-1
Recommendation Date	12/20/2022
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-013-22 ASHRAE 140 reference
CDP ID #	792
Code	IECC CE
Code Section(s)	Chapter 6
Location	base
Proponent	Emily Toto etoto@ashrae.org
Proposal Status	SC review
Subcommittee	CE Admin
Subcommittee Notes	It was noted that footnotes to Tables C505.2.2 and C505.24 may need revision or removal. The committee intends to verify the requirements for occupancy class and use outlined in the tables.
Recommendation	Reason Statement: To ensure compliance with the most current requirements of the referenced standard.
Vote	Approved as Submitted 8-0-1
Recommendation Date	12/20/2022
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-030-22 SEHPCAC revision of CEPI-203
CDP ID #	766
Code	IECC CE
Code Section(s)	C405.13
Location	base
Proponent	SEHPCAC sehpcac@iccsafe.org
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason Statement: The proposal will clarify application of metering requirements to include all energy.
Recommendation	APPROVED AS MODIFIED TABLE C405.13.2 ENERGY USE CATEGORIES | LOAD CATEGORY	DESCRIPTION OF ENERGY USE
Electric vehicle charging	*Electric vehicle* charging loads <u>that are powered through the *building* service</u>.	
Vote	5 - 3 - 4
Recommendation Date	January 9, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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Proposal #	CED1-033-22 Energy monitoring disclosure update
CDP ID #	783
Code	IECC CE
Code Section(s)	C405.13
Location	base
Proponent	Steven Rosenstock srosenstock@eei.org
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason statement: The language in Public Comment Draft #1 that is proposed to be deleted will increase the usefulness of the data collected by allowing it to be compared with the specific model (for those that did the simulation) of the building.
Recommendation	DISAPPROVE
Vote	10-5-2
Recommendation Date	January 9, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Proposal #	CED1-034-22 Energy monitoring all energy forms
CDP ID #	789
Code	IECC CE
Code Section(s)	C405.13
Location	base
Proponent	Steven Rosenstock srosenstock@eei.org
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason Statement: Based on prior action on CED1-30.
Recommendation	DISAPPROVE
Vote	8-1-2
Recommendation Date	January 9, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Proposal #	CED1-035-22 Energy monitoring clean up
CDP ID #	905
Code	IECC CE
Code Section(s)	C405.13
Location	base
Proponent	Helen Sanders helen.sanders@Technoform.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason Statement: Based on prior action on CED1-30.
Recommendation	DISAPPROVE
Vote	8-0-4
Recommendation Date	January 9, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-036-22 EV monitoring update
CDP ID #	778
Code	IECC CE
Code Section(s)	C405.13.2 table
Location	base
Proponent	Steven Rosenstock srosenstock@eei.org
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason Statement: Ensures the monitoring of EV charging loads does not include equipment and systems that are supplied by a separate service from an energy monitored building.
Recommendation	APPROVED AS SUBMITTED
Vote	9-2-2
Recommendation Date	January 9, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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Proposal #	CED1-037-22 EV energy monitoring removal
CDP ID #	832
Code	IECC CE
Code Section(s)	C405.13.2 table
Location	base
Proponent	Greg Johnson gjohnsonconsulting@gmail.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason Statement: Based on prior action related to CED1-036.
Recommendation	DISAPPROVE
Vote	7-3-2
Recommendation Date	January 9, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Proposal #	CED1-090-22 Project specific fenestration size
CDP ID #	901
Code	IECC CE
Code Section(s)	C303.1.3
Location	base
Proponent	Helen Sanders helen.sanders@Technoform.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: As modified, this proposal clarifies that either a label affixed to the product or a label certificate for the project in compliance with NFRC 100 and 200 may be provided for fenestration. This is also consistent with how ASHRAE 90.1 handles fenestration labeling.
Recommendation	**Approve as modified** **Modification:** **FINAL VOTED VERSION (can replace original CED1-90 proposal with this):** **Revise as follows:** **C303.1.3 Fenestration product rating.** *U*-factors, _solar heat gain coefficient_ (SHGC), and _visible transmittance_ (VT) of fenestration products shall be determined as follows: 1. For windows, doors and skylights, *U*-factor, SHGC, and VT ratings shall be determined in accordance with NFRC 100 and NFRC 200. 2. Where required for garage doors and rolling doors, *U*-factor ratings shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105. *U*-factors, SHGC, and VT shall be determined by an accredited, independent laboratory, and *labeled* and certified by the manufacturer by a label affixed to the product or a label certificate specific to the products in the project. Products lacking such a *labeled U*-factor shall be assigned a default *U*-factor from Table C303.1.3(1) or Table C303.1.3(2). ~~The *solar heat gain coefficient* (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance~~

with NFRC 200 by an accredited, independent laboratory, and *labeled* and certified by the manufacturer. Products lacking such a *labeled* SHGC or VT shall be assigned a default SHGC or VT from Table C303.1.3(3). For Tubular Daylighting Devices, VT_{annual} shall be measured and rated in accordance with NFRC 203.

SHOWING MODIFICATIONS RELATIVE TO THE ORIGINAL PROPOSAL CED1-90 IN BLUE:

Revise as follows:

C303.1.3 Fenestration product rating. *U*-factors, *solar heat gain coefficient* (SHGC), and *visible transmittance* (VT) of fenestration products shall be determined as follows:

1. For windows, doors and skylights, *U*-factor, SHGC, and VT ratings shall be determined in accordance with NFRC 100 and NFRC 200. For the Total Building Performance option in Section C407, the U-factor, SHGC, and VT modeled in the *proposed* design shall be based on either the proposed project specific size(s) and configuration(s) for all *fenestration* products representing 5% or more of the total *fenestration* area, or based on the NFRC 100 standard sizes and configurations for all *fenestration*. Physical testing of *fenestration* at the project size and configuration fenestration to verify U-factor is not required.

2. Where required for garage doors and rolling doors, *U*-factor ratings shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors, SHGC, and VT shall be determined by an accredited, independent laboratory, and *labeled* and certified by the manufacturer by a label affixed to the product or a label certificate specific to the products in the project.

Products lacking such a *labeled U*-factor shall be assigned a default *U*-factor from Table C303.1.3(1) or Table C303.1.3(2). The *solar heat gain coefficient* (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and *labeled* and certified by the manufacturer. Products lacking such a *labeled* SHGC or VT shall be assigned a default SHGC or VT from Table C303.1.3(3). For Tubular Daylighting Devices, VT_{annual} shall be measured and rated in accordance with NFRC 203.

| Vote | **Approve as modified** 13-0-2 |

Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-126-22 Fenestration u-factors
CDP ID #	826
Code	IECC CE
Code Section(s)	C402.5 table
Location	base
Proponent	Helen Sanders helen.sanders@Technoform.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: Because these reductions in U-factors are technically feasible and cost-effective.
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 13-0-1
Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-127-22 Orientation
CDP ID #	696
Code	IECC CE
Code Section(s)	C402.5.1.3
Location	base
Proponent	Emily Toto etoto@ashrae.org
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: As modified this proposal introduces requirements to ensure the energy efficient design of fenestration with East and West orientations.
Recommendation	**Approve as modified** **Modification:** NORTH-ORIENTED. facing within 67.5 degrees of true north in the northern hemisphere; (however, or facing within 67.5 degrees of true south in the southern hemisphere.) - SOUTH-ORIENTED. facing within 45 degrees of true south in the northern hemisphere; (however, or facing within 45 degrees of true north in the southern hemisphere.) EAST-ORIENTED. facing within 45 degrees of true east to the south and within less than 22.5 degrees of true east to the north in the northern hemisphere; (however, or facing within 45 degrees of true east to the north and within less than 22.5 degrees of true east to the south in the southern hemisphere.) WEST-ORIENTED. facing within 45 degrees of true west to the south and within less than 22.5 degrees of true west to the north in the northern hemisphere; (however, or facing within 45 degrees of true west to the north and within less than 22.5 degrees of true west to the south in the southern hemisphere.)
Vote	**Approve as modified** 7-6-3
Recommendation Date	1/5/23

Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Proposal #	CED1-141-22 Automated window shading
CDP ID #	662
Code	IECC CE
Code Section(s)	C406.3.4
Location	base
Proponent	Reid Hart reid.hart.pe@gmail.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: The alternative approach for reduced credits for a reduced automatic shading area allows flexibility for certain building types and configurations.
Recommendation	**Approve as modified** **Modification:** C406.3.4 G03 Automated Shading Load Management. Where fenestration on east, south, and west exposures ~~exceeds~~ is greater than 20 percent of wall area, load management credits shall be achieved as follows: 1. Automatic exterior shading devices or dynamic glazing that are capable of reducing solar gain (SHGC) through sunlit fenestration by ~~at least~~ not less than 50 percent when fully closed shall receive the full credits in Tables C406.3(1) through C406.3(9). The exterior shades shall have fully open and fully closed SHGC determined in accordance with AERC 1. 2. Automatic interior shading devices with a ~~minimum~~ solar reflectance of not less than 0.50 for the surface facing the fenestration shall receive 40 percent of the credits in Tables C406.3(1) through C406.3(9). 3. All shading devices, dynamic glazing, or shading attachments shall: 3.1 Provide ~~at least~~ not less than 90 percent coverage of the total fenestration on east, south, and west exposures in the *building* to achieve the credits determined in items 1 or 2. Alternatively, provide not less than ~~at least~~ 70 percent coverage of the total fenestration on the south and west exposures in the *building* to achieve 50 percent of the credits determined in items 1 or 2. 3.2 Be automatically controlled and shall modulate in multiple steps or continuously the amount of solar gain and light transmitted into the space in response to peak periods and either daylight levels or solar intensity. 3.3 Include a manual override located in the same enclosed space as the shaded vertical fenestration that shall override operation of automatic controls for no longer than four hours. Such override shall be locked out

	during peak periods.
Vote	**Approve as modified** 14-0-1
Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-125-22 Multifamily window alignment
CDP ID #	695
Code	IECC CE
Code Section(s)	C402.5 table
Location	base
Proponent	Diana Burk diana@newbuildings.org
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: This proposal adds unnecessary complexity and would erroneously apply to not only multifamily as intended but also hotels and motels. There are also problems with wording of the definition, footnote, and exception. No analysis of cost effectiveness of the lower U-factors was provided.
Recommendation	**Disapprove**
Vote	**Disapprove** 13-1-3
Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-129-22 Air barrier exception
CDP ID #	868
Code	IECC CE
Code Section(s)	C402.6.1.2
Location	base
Proponent	Theresa Weston holtweston88@gmail.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** Reason statement and cost justification did not provide enough information for this change in the IECC
Recommendation	**Disapprove**
Vote	**Disapprove** 8-4-1
Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Proposal #	CED1-130-22 Air barrier construction language correction
CDP ID #	897
Code	IECC CE
Code Section(s)	C402.6.1.2
Location	base
Proponent	Bob Zabcik bob@ztech-consulting.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** Design wind loads has specific structural meaning and may causes confusion to the intent of this section.
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 7-4-2
Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-131-22 Air leakage compliance
CDP ID #	871
Code	IECC CE
Code Section(s)	C402.6.1.3
Location	base
Proponent	Theresa Weston holtweston88@gmail.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** This proposal adds the option of inspection with the building under depressurization in addition to the current requirement for the building to pressurized. ASTM E1186 contains instructions for conducting the evaluation under either depressurization or pressurization. In some situations, depressurization may be more efficient than pressurization to conduct the inspection.
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 14-0-1
Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-133-22 Whole building test method exception
CDP ID #	869
Code	IECC CE
Code Section(s)	C402.6.2.1
Location	
Proponent	Anjana Agarwal anjana@theadhocgroup.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: Vendors should not be certifiers of their own products.
Recommendation	**Disapprove**
Vote	**Disapprove** 12-0-1
Recommendation Date	1/5/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-185-22 C406 Editorial update
CDP ID #	637
Code	IECC CE
Code Section(s)	C406.1
Location	base
Proponent	Reid Hart reid.hart.pe@gmail.com
Proposal Status	SC review
Subcommittee	CE Model, Metrics (primary), CE Envelope (Secondary)
Subcommittee Notes	**Modeling & Metrics Subcommittee:** This proposal provides an editorial update to Section C406. Tables 406.2(4) and 406.2(5) have been modified by inserting an "x" to indicate that ECM credits are not available in certain climate zones. *(tables below)* **Envelope Subcommittee:** Agree with Modeling SC comments, and agree with envelope parts of the proposal. However, terminology regarding air leakage credit should be made consistent, and avoid any confusion between air leakage and water leakage. ENVELOPE ADDITIONAL MOD: change "~~Envelope leakage reduction~~ Reduced air leakage" in Tables C406.2(1) through C406.2(9) to match the title of the E03 credit in C406.2.1.3.

TABLE 406.2(4) BASE ENERGY CREDITS FOR GROUP B OCCUPANCIES[a]

Portions of table not shown remain unchanged.

ID	Energy Credit Measure	Section	Climate Zone																			
			0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
E02	UA reduction (15%)	C406.2.1.2	4	7	4	7	3	4	7	2	~~0~~1	7	2	3	10	6	4	12	9	19	11
E03	Envelope leak~~age~~ reduction	C406.2.1.3	5	3	4	2	2	2	5	1	~~1~~x	8	~~1~~x	2	13	4	~~1~~x	18	9	18	7

a. "x" indicates measure is not available for building occupancy in that climate zone.

TABLE 406.2(5) BASE ENERGY CREDITS FOR GROUP A-2 OCCUPANCIES[a]

Portions of table not shown remain unchanged.

ID	Energy Credit Measure	Section	Climate Zone																			
			0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
E03	Envelope leak~~age~~ reduction	C406.2.1.3	2	1	1	1	1	2	3	11	2	1	24	4	6	33	9	3	42	29	36	16
E04	Add Roof Insulation	C406.2.1.4	1	1	~~1~~x	1	1	1	1	2	1	1	1	1	1	2	2	1	2	2	1	2
E05	Add Wall Insulation	C406.2.1.5	1	1	~~1~~ x	1	1	2	3	3	1	2	1	1	2	2	2	2	2	2	2	2
L02	Lighting dimming & tuning	C406.2.5.2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	~~1~~x
L03	Increase occp. sensor	C406.2.5.3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	~~1~~ x

a. "x" indicates measure is not available for that measure.

Recommendation	Approve (As Modified)
Vote	*Modeling & Metrics SC:* Approve (As Modified) – 14, Disapprove-0, Abstain-1 *Envelope SC:* Approve (As Modified) 12-0-2 CNV
Recommendation Date	12/19/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code

Code Change Proposal Tracking Sheet

Proposal #	CED1-190-22 C406 Energy credit carryover allowance
CDP ID #	788
Code	IECC CE
Code Section(s)	C406.1.1.1
Location	base
Proponent	Reid Hart reid.hart.pe@gmail.com
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal allows for excess renewable and load management credits to be applied to the energy efficiency requirements. A workgroup was formed that modified the original proposal to ensure that compliance can be achieved without relying on measures for equipment efficiency in excess of EPACT requirements.
Recommendation	Approve as modified (see attached- Include highlighted Tables C406.1.1(2) and CD101.2 based on the passage of CED1-189)
Vote	Approve as modified-7, Disapprove-2, Modify further-1, Abstain-1
Recommendation Date	1/4/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____x_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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C406 Energy Credit Carryover Allowance (CED1-190)

IECC: C406.1.1, CD101.1, CF102.1
Proponents: Reid Hart, representing Pacific Northwest National Laboratory (reid.hart.pe@gmail.com); Mike Tillou (

2024 International Energy Conservation Code
Revise as follows

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.

Where a project contains multiple occupancies, credits in Table C406.1.1(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 SectionC406.

Exceptions:

1. Unconditioned parking garages that achieve 50% of the credits required for use groups S-1 and S-2 in Table C406.1.1(1).
2. Portions of buildings devoted to manufacturing or industrial use.
3. 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:

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

Where:

EEC_{red}	=	Reduced required energy efficiency credits
EEC_{tbl}	=	Required energy efficiency credits from Table C406.1.1(1)
$SRLM_{lim}$	=	Surplus renewable and load management credit limit from Table C406.1.1(2)
$SRLM_{adj}$	=	1.0 for all-electric or all-renewable buildings (excluding emergency generation)
		0.7 for buildings with fossil fuel equipment (excluding emergency generation)
RLM_{ach}	=	Achieved renewable and load management credits from Section C406.3
RLM_{req}	=	Required renewable and load management credits from Section C406.1.2

TABLE C406.1.1(1)
ENERGY CREDIT REQUIREMENTS BY BUILDING OCCUPANCY GROUP

No change to table

TABLE C406.1.1(2)

LIMIT TO ENERGY EFFICIENCY CREDIT CARYOVER 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	5	5	5	5	5	5	5	5	5	5	5
I-2	16	14	11	8	6	5	5	5	5	5	5	5	6	15	18	10	14	10	25
R-1	7	5	8	5	19	5	13	20	20	5	20	20	5	16	18	5	5	5	5
B	7	5	5	8	6	6	5	10	14	5	21	15	5	16	26	5	5	5	9
A-2	18	16	14	15	13	9	5	5	11	5	5	5	5	5	7	5	5	5	5
M	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
E	13	13	18	16	17	14	6	20	25	9	26	13	7	15	10	5	5	9	5
S-1 and S-2	5	5	5	5	5	5	5	5	5	5	5	5	5	14	5	5	5	5	17
All Other	5	5	5	5	5	5	5	5	8	5	5	5	5	5	5	5	5	5	5

==Note to committee: If CED1-189 passes, replace the values in table C406.1.1(2) with the values below.==

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	16	21	25	22	20	5	5	23	6	5	9	5	5	5	7	5	5	5	5
I-2	23	21	20	17	16	14	7	14	14	11	17	15	17	27	30	19	23	18	31
R-1	7	5	8	5	19	5	13	20	20	5	20	20	5	16	18	5	5	5	5
B	11	6	6	10	5	5	5	14	14	5	22	15	13	26	33	11	18	18	38
A-2	22	20	17	19	17	13	5	11	16	5	8	8	6	24	29	5	9	14	34
M	5	5	5	5	10	8	5	5	8	5	5	5	5	5	5	5	5	5	5
E	24	24	31	28	31	28	19	34	43	25	43	30	26	34	32	19	22	34	18
S-1 and S-2	21	22	23	18	26	21	5	12	30	5	5	16	5	25	20	5	5	5	25
All Other	5	5	5	5	5	5	5	5	13	5	5	5	5	5	10	5	5	5	5

. . .

CD101.1 Prescriptive compliance. Where compliance is demonstrated using the prescriptive compliance option in Section C401.2.1, the number of additional efficiency

credits required by Section C406.1 shall be 50 percent higher than that required by Table C406.1.1(1).

> **Exception:** 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:

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

Where:
EEC_{red}	=	Reduced required energy efficiency credits
EEC_{tbl}	=	Required energy efficiency credits from Table C406.1.1(1)
$SRLM_{lim}$	=	Surplus renewable and load management credit limit from Table CD101.1
$SRLM_{adj}$	=	1.0 for all-electric or all-renewable buildings (excluding emergency generation)
		0.7 for buildings with fossil fuel equipment (excluding emergency generation)
RLM_{ach}	=	Achieved renewable and load management credits from Section C406.3
RLM_{req}	=	Required renewable and load management credits from Section C406.1.2

TABLE CD101.1
LIMIT TO ENERGY EFFICIENCY CREDIT CARYOVER 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	19	25	27	29	33	20	15	37	36	5	37	34	5	8	36	5	5	5	5
I-2	17	13	10	5	5	5	5	5	5	5	5	5	7	16	20	15	21	20	43
R-1	9	5	9	5	22	7	13	23	25	5	22	19	5	18	16	5	5	5	6
B	5	5	5	5	6	6	5	9	13	10	26	20	9	25	34	5	9	9	32
A-2	31	28	25	26	23	16	5	8	16	5	8	7	5	5	9	5	5	5	5
M	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
E	17	15	23	16	20	14	5	22	27	10	32	16	10	21	12	5	5	15	10
S-1 and S-2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	43
All Other	5	5	5	5	5	5	5	5	6	5	5	5	5	5	5	5	5	5	5

==Note to committee: If CED1-189 passes, replace the values in table CD101.1 with the values below.==

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	49	54	63	63	63	41	45	65	51	14	52	49	5	23	51	5	5	16	12
I-2	27	24	24	18	17	15	5	12	11	12	19	16	23	34	38	29	34	32	52
R-1	9	5	9	5	22	7	13	23	25	5	22	19	5	18	16	5	5	5	6
B	10	5	5	7	5	5	5	15	13	10	28	20	27	40	44	33	36	39	75
A-2	37	34	30	32	29	22	6	18	24	5	14	13	24	39	42	22	26	36	60
M	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
E	34	31	42	34	41	35	22	43	54	34	58	42	39	49	45	35	35	52	57
S-1 and S-2	5	5	5	5	5	5	5	5	5	5	5	5	5	16	5	5	5	12	55
All Other	5	5	5	5	5	5	5	5	14	5	5	5	5	8	12	5	5	5	13

. . .

CF102.1 Advanced Energy Credit Package requirements. The requirements of this Section ~~supercede~~ supersede the requirements of Section C406.1.1. Projects shall comply with measures from C406.2 to achieve the minimum number of required efficiency credits from Table ~~CD~~ CF102.1(1) based on building occupancy group and climate zone. Projects with multiple occupancies, unconditioned parking garages, *alterations*, and *buildings* with separate shell-and-core and build-out construction permits shall comply as follows:

Where a project contains multiple occupancies, credits in Table ~~CD~~ CF102.1(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 Section C406 and Appendix ~~CD~~ CF.

Exceptions:

1. Unconditioned parking garages that achieve 50 percent of the credits required for use groups S-1 and S-2 in Table CD102.1.
2. Portions of buildings devoted to manufacturing or industrial use.
3. 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:

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

Where:

EEC_{red}	=	Reduced required energy efficiency credits
EEC_{tbl}	=	Required energy efficiency credits from Table CF102.1(1)

SRLM$_{lim}$ = Surplus renewable and load management credit limit from Table CF102.1(2)

SRLM$_{adj}$ = 1.0 for all-electric or all-renewable buildings (excluding emergency generation)

= 0.7 for buildings with fossil fuel equipment (excluding emergency generation)

RLM$_{ach}$ = Achieved renewable and load management credits from Section C406.3

RLM$_{req}$ = Required renewable and load management credits from Section C406.1.2

TABLE CF102.1(1)
ENERGY CREDIT REQUIREMENTS BY BUILDING OCCUPANCY GROUP

No change to table

TABLE CF102.1(2)
LIMIT TO ENERGY EFFICIENCY CREDIT CARYOVER 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	100	100	114	110	113	91	95	115	101	73	102	99	54	73	101	45	50	66	62
I-2	30	25	26	20	28	33	38	31	33	37	30	32	41	41	50	53	56	75	80
R-1	20	8	20	5	26	22	20	28	30	19	26	23	24	28	28	27	30	43	54
B	25	19	18	20	15	15	15	24	25	31	36	32	37	40	43	42	40	51	66
A-2	9	5	5	5	5	5	5	5	5	9	5	5	21	9	5	32	19	49	61
M	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	10
E	24	24	31	29	29	28	19	33	39	31	43	33	34	37	33	31	33	46	54
S-1 and S-2	5	5	5	5	5	5	5	5	5	5	5	5	37	19	5	49	41	51	56
All Other	5	5	5	5	5	5	5	5	15	5	6	8	5	11	15	5	5	9	20

Reason Statement for as modified version:

The public comment has been modified by a diverse working group. The following changes were made:

- The carryover limit is determined specifically for each occupancy group and climate zone to better reflect the need for carryover credits, rather than the original across the board percentage allowance.

- A minimum carryover of 5 points is allowed across the board, and to account for round-down, 2 points are added to the carryover needed to meet efficiency credit requirements with minimum efficiency equipment.
- The carryover limit is adjusted for buildings that use fossil fuels (excluding emergency generation) by a factor of 0.7 to reflect the fact that the renewable and load management credits are based on cost rather than energy for the efficiency credits, and gas costs less per site Btu than electricity.
- The current AMPC includes alternate table values that apply if CED1-189 is passed, as that outcome is not yet known. If it passes and increases efficiency credit requirements, more carryover points will be necessary to not use equipment efficiency increases.

A spreadsheet is attached, showing the calculation of carryover credits needed, and credits available without equipment efficiency increases. The credits available without equipment efficiency increases is based on a reasonable selection of efficiency credit measures. For appendix CD and CF a more aggressive package of non-equipment efficiency measures is selected reflecting the deeper energy saving policy reflected by those appendices. In the spreadsheet, for each case, the general flow of calculation is as follows:

- Based on a reasonable or advanced approach, what are the selected measures for each building type, excluding measures that require increased efficiency above EPACT minimums.
- What are the energy efficiency credits achieved by that package.
- Compare those to the requirements for the particular case to find the carryover points needed to meet the efficiency requirements with no increase in regulated equipment efficiency.
- Where there is not a need for carryover, include the minimum carryover allowance and add the round off credit where there is a need for carryover.
- Review the renewable requirement to meet the requirement and adjust for the surplus load management credits not required to meet the load management requirements.
- Determine the net renewable installation or RECS needed to meet energy efficiency credit requirement, if any, with a sensitivity analysis of adjustment factors to account for the difference in gas and electric pricing vs. delivered site energy.

The committee reviewed the sensitivity analysis to arrive at a recommended code language.

Original Reason Statement (adjusted to fit current as modified proposal): This proposal allows for excess renewable and load management credits to be applied to the requirements for energy efficiency credits.

This change accomplishes two objectives:

1. The change will make the additional credit section more aligned with ASHRAE Standard 90.1, which has a credit requirement and allows up to a 60% contribution of renewable and load management credits to be mixed with energy efficiency credits to meet the total credit requirement in that standard.

2. By creating more flexibility in the type of credits used, it will be easier to meet the energy efficiency requirement without using any efficiency improvements to federally regulated equipment and appliances.

A cost-effective demonstration credit package was separately published. Where the focus is cost-effectiveness, selecting cost-effective higher efficiency regulated equipment is appropriate. The purpose of this modification and review is to demonstrate that a reasonable package can be assembled that does not rely on improvements to the efficiency of federally regulated equipment. To this end, a package of measures was selected to find how many credits from the renewable and load management category would be necessary to meet the energy efficiency credit requirement. The selected measures are shown in the attached spreadsheet.

While in particular climate zones, all these measures would not need to be applied to meet the credit requirements, the same selections were applied across the board to determine how much extra credits from the renewable and load management category would be needed to meet the energy efficiency credit requirements without higher efficiency EPACT equipment. The needed points were determined for different situations, as shown in the spreadsheet.

Based on this review, the exceptions were expanded to allow surplus renewable and load management credits to be applied to the energy efficiency requirement with limits as determined in the spreadsheet.

In addition to creating a requirement that can be met without using higher efficiency EPACT equipment, the carryover exceptions allow more flexibility in the energy credit structure. Appendix CF provides for a jurisdiction that has an aggressive energy saving policy to increase the energy credits required.

Appendix CD and CF provide for higher energy efficiency credit requirements, and specific allowable carryover credits are calculated for each appendix.

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

The suggested changes relate to optional measures that can be selected in building design. Since there is no specific requirement for a particular measure, there is no impact on the cost of construction. There could be a reduction in cost from this particular proposal, as more flexibility in measure selection is provided, allowing possibly more cost effective renewable and load management measures to replace energy efficiency measures.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-189-22 Energy credit requirement
CDP ID #	707
Code	IECC CE
Code Section(s)	C406.1.1 Table
Location	base
Proponent	Mike Waite mwaite@aceee.org
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal reinstates the CEPI-193 working group credits. Changes were made based on a misreading of the cost analysis guidance resulting in an estimated 13% efficiency reduction. The original proposal was modified to align with the final package of energy efficiency credit levels for R-1, S-1, S-2 and "All Other" occupancies.
Recommendation	Approve as modified (See attached modification)
Vote	Approve as modified-10, Disapprove-1, Abstain-1
Recommendation Date	1/4/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Revise Table C406.1.1 as follows:

Table C406.1.1 Energy Credit Requirements by Building Occupancy Group

~~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~~	~~65~~	~~66~~	~~67~~	~~77~~	~~80~~	~~86~~	~~80~~	~~81~~	~~90~~	~~86~~	~~90~~	~~90~~	~~86~~	~~90~~	~~90~~	~~79~~	~~89~~	~~80~~	~~78~~
~~I-2~~	~~43~~	~~42~~	~~38~~	~~37~~	~~36~~	~~38~~	~~32~~	~~32~~	~~30~~	~~36~~	~~36~~	~~35~~	~~43~~	~~43~~	~~44~~	~~46~~	~~47~~	~~50~~	~~53~~
~~R-1~~	~~63~~	~~62~~	~~66~~	~~65~~	~~70~~	~~71~~	~~77~~	~~80~~	~~84~~	~~81~~	~~83~~	~~88~~	~~85~~	~~86~~	~~90~~	~~83~~	~~87~~	~~87~~	~~85~~
~~B~~	~~62~~	~~62~~	~~64~~	~~66~~	~~66~~	~~65~~	~~64~~	~~64~~	~~68~~	~~70~~	~~72~~	~~74~~	~~71~~	~~73~~	~~77~~	~~71~~	~~74~~	~~74~~	~~71~~
~~A-2~~	~~70~~	~~70~~	~~72~~	~~72~~	~~75~~	~~75~~	~~70~~	~~73~~	~~82~~	~~69~~	~~74~~	~~78~~	~~67~~	~~72~~	~~78~~	~~60~~	~~67~~	~~57~~	~~51~~
~~M~~	~~80~~	~~79~~	~~83~~	~~79~~	~~81~~	~~84~~	~~67~~	~~74~~	~~87~~	~~80~~	~~66~~	~~65~~	~~79~~	~~62~~	~~50~~	~~75~~	~~67~~	~~75~~	~~58~~
~~E~~	~~56~~	~~57~~	~~55~~	~~58~~	~~58~~	~~57~~	~~59~~	~~62~~	~~59~~	~~61~~	~~66~~	~~62~~	~~64~~	~~67~~	~~67~~	~~65~~	~~67~~	~~63~~	~~58~~
~~S-1 and S-2~~	~~61~~	~~60~~	~~61~~	~~60~~	~~58~~	~~57~~	~~44~~	~~54~~	~~62~~	~~85~~	~~68~~	~~75~~	~~90~~	~~82~~	~~72~~	~~90~~	~~89~~	~~90~~	~~90~~
~~All Other~~	~~31~~	~~31~~	~~31~~	~~32~~	~~32~~	~~33~~	~~30~~	~~32~~	~~36~~	~~35~~	~~35~~	~~35~~	~~37~~	~~36~~	~~36~~	~~36~~	~~37~~	~~36~~	~~34~~

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	85	85	91	100	100	100	100	100	100	94	100	100	93	100	100	100	100	100	100
I-2	50	49	47	46	46	48	44	44	45	48	48	49	54	55	56	55	56	58	59
R-1	~~59~~63	~~57~~62	~~60~~66	~~60~~65	~~62~~70	~~62~~71	~~65~~77	~~67~~80	~~68~~84	~~67~~81	~~70~~83	~~73~~88	~~78~~85	~~75~~86	~~82~~90	86	~~82~~87	94	100
B	66	63	65	68	64	63	67	68	68	70	73	74	83	83	84	95	92	94	100
A-2	74	74	75	76	79	79	77	80	87	73	78	82	100	98	100	100	100	100	100
M	95	94	95	93	94	97	87	85	97	82	75	68	79	94	83	100	98	100	87
E	67	68	68	70	72	71	72	76	77	77	83	79	83	86	89	90	89	88	89
S-1 and S-2	90	89	95	92	93	91	66	83	95	~~38~~85	~~62~~68	90	100	93	87	100	100	100	98
All Other	37	36	37	38	38	39	37	38	41	~~34~~35	37	39	42	43	44	47	46	47	47

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-193-22 Additional efficiency, renewable load management req
CDP ID #	780
Code	IECC CE
Code Section(s)	C406.1.2 table
Location	base
Proponent	Alex Smith asmith@nahb.org
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal reduces the required renewable and load management credits for R-2, R-4 and I-1 occupancies and proposes that that the credits for these occupancies be equivalent to R-1. Ample documentation justifying the credits was provided by PNNL in the development of CEPI-193. The proponents provided no justification for why the credits should be lowered for R-2, R-4 and I-1 occupancies.
Recommendation	Disapprove
Vote	Approve-2, Disapprove-10, Abstain-1
Recommendation Date	1/4/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-182-22 Thermal block definition
CDP ID #	750
Code	IECC CE
Code Section(s)	C202
Location	base
Proponent	Martha Vangeem martha.vangeem@gmail.com
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal would change the definition of "block" to "thermal block" in the context of energy simulation. This definition change aligns with the use of "thermal block" in C407. A modification is proposed that updates the definition in C409.
Recommendation	Approve as modified (see attached modification)
Vote	Approve as modified-12, Disapprove-0, Abstain-1
Recommendation Date	1/10/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

SECTION 409
CALCULATION OF HVAC TOTAL SYSTEM PERFORMANCE RATIO

C409.3 Core & Shell / Initial Build-Out, and Future System Construction Analysis. Where the building permit applies to only a portion of the HVAC system in a *building* and the remaining components will be designed under a future building permit or were previously installed, the future or previously installed components shall be modeled as follows:
1. Where the HVAC zones that do not include HVAC systems in the current permit will be or are served by independent systems, then the thermal block including those zones shall not be included in the model.
…
C409.5.3.1 Compliance Report Building permit submittals shall include:
1. A report produced by the simulation software that includes the following:
1.1 Address of the building.
1.2 Name of individual completing the compliance report.
1.3 Name and version of the compliance software tool
1.4 The dimensions, floor heights and number of floors for each thermal block.
1.5 By thermal block, the U-factor, C-factor, or F-factor for each simulated opaque envelope component and the U-factor and SHGC for
each fenestration component.
1.6 By thermal block or by surface for each thermal block, the fenestration area.
1.7 By thermal block, a list of the HVAC equipment simulated in the proposed design including the equipment type, fuel type, equipment
efficiencies and system controls.
1.8 Annual site HVAC energy use by end use for the proposed and baseline building.
1.9 Annual sum of heating and cooling loads for the baseline building.
1.10 The HVAC total system performance ratio for both the standard reference design and the proposed design.
…
4. Floor plan of the building identifying:
4.1 How portions of the buildings are assigned to the simulated thermal blocks.
4.2 Areas of the building that are not covered under the requirements of Section C403.1.1.
…

C409.6.1.1 Thermal bBlock Geometry. The geometry of buildings shall be configured using one or more thermal blocks. Each thermal block shall define attributes including thermal block dimensions, number of floors, floor to floor height and floor to ceiling height. Simulation software may allow the use of simplified shapes (such as rectangle, L shape, H Shape, U shape or T shape) to represent thermal blocks. Where actual building shape does not match these pre-defined shapes, simplifications are permitted providing the following requirements are met:
1. The conditioned floor area and volume of each thermal block shall match the proposed design within 10 percent.
2. The area of each exterior envelope component from Table C402.1.4 is accounted for within 10 percent of the actual design.
3. The area of vertical fenestration and skylights is accounted for within 10 percent of the actual design.

4. The orientation of each component in 2 and 3 above is accounted for within 45 degrees of the actual design.

The creation of additional thermal blocks may be necessary to meet these requirements. A more complex zoning of the building shall be allowed where all thermal zones in the reference and proposed model are the same and rules related to thermal block geometry and HVAC system assignment to thermal blocks are met with appropriate assignment to thermal zones.

Exception: Portions of the building that are unconditioned or served by systems not covered by the requirements of Section C403.1.1 shall be omitted.

…

C409.6.1.1.1 Number of thermal bBlocks One or more thermal blocks may be required per building based on the following restrictions:

1. Each thermal block can have only one occupancy type (multifamily dwelling unit, multifamily common area, office, library, education, hotel/motel or retail). Therefore, at least one single thermal block shall be created for each unique use type.

2. Each thermal block can be served by only one type of HVAC system. Therefore, a single block shall be created for each unique HVAC system and use type combination. Multiple HVAC units of the same type may be represented in one thermal block. Table D601.10.2 provides directions for combining multiple HVAC units or components of the same type into a single block.

3. Each thermal block can have a single definition of floor to floor or floor to ceiling heights. Where floor heights differ by more than two feet, unique thermal blocks should be created for the floors with varying heights.

…

C409.6.1.2 Thermal Zoning Each floor in a thermal block shall be modeled as a single thermal zone or as five thermal zones consisting of four perimeter zones and a core zone. Below grade floors shall be modeled as a single thermal block. If any facade in the thermal block is less than 45 feet in length, there shall only be a single thermal zone per floor. Otherwise each floor shall be modeled with five thermal zones. A perimeter zone shall be created extending from each facade to a depth of 15 feet. Where facades intersect, the zone boundary shall be formed by a 45 degree angle with the two facades. The remaining area or each floor shall be modeled as a core zone with no exterior walls.

C409.6.1.3 Occupancy Building occupancies modeled in the standard reference design and the proposed design shall comply with the following requirements.

C409.6.1.3.1 Occupancy Type. The occupancy type for each thermal block shall be consistent with the building area type as determined in accordance with Section C405.4.2.1. Portions of the building that are building area types other than multifamily dwelling unit, multifamily common area, office, school (education), library, or retail shall not be included in the simulation.

Surfaces adjacent to such building portions shall be modeled as adiabatic in the simulation program.

C409.6.1.3.2 Occupancy schedule, density, and heat gain The occupant density, heat gain, and schedule shall be for multifamily, office, retail, library, hotel/motel or school as specified by ASHRAE Standard 90.1 Normative Appendix C.

C409.6.1.4 Envelope Components. Building envelope components modeled in the standard reference design and the proposed design shall comply with the requirements of this Section.

C409.6.1.4.1 Roofs Roofs will be modeled with insulation above a steel roof deck. The roof U-factor and area shall be modeled as in the proposed design. If different roof thermal properties are present in a single thermal block, an area weighted U-factor shall be
used. Roof solar absorptance shall be modeled at 0.70 and emittance at 0.90.

C409.6.1.4.2 Above grade walls. Walls will be modeled as steel frame construction. The U-factor and area of above grade walls shall be modeled as in the proposed design. If different wall constructions exist on the facade of a thermal block an area-weighted U-factor shall be used.

C409.6.1.4.3 Below grade walls. The C-factor and area of below grade walls shall be modeled as in the proposed design. If different slab on grade floor constructions exist in a thermal block, an area-weighted C- factor shall be used.

C409.6.1.4.4 Above grade exterior floors. Exterior floors shall be modeled as steel frame. The U-factor and area of floors shall be modeled as in the proposed design. If different wall constructions exist in the thermal block an area-weighted U-factor shall be used.

C409.6.1.4.5 Slab on grade floors. The F-factor and area of slab on grade floors shall be modeled as in the proposed design. If different below grade wall constructions exist in a thermal block, an area-weighted F- factor shall be used.

C409.6.1.4.6 Vertical Fenestration The window area and area weighted U-factor and SHGC shall be modeled for each façade based on the proposed design. Each exterior surface in a thermal block must comply with Section C409.6.1.1.1 item 5. Windows will be combined into a single window centered on each facade based on the area and sill height input by the user. When different U
values, SHGC or sill heights exist on a single facade, area weighted average for each shall be input by the user.

…

C409.6.1.10.2 Proposed building HVAC system simulation The HVAC systems shall be modeled as in the proposed design at design conditions unless otherwise stated with clarifications and simplifications as described in Tables C409.6.1.10.2(1)
and C409.6.1.10.2(2). System parameters not described in the following sections shall be simulated to meet the minimum requirements of Section C403. All zones within a thermal block shall be served by the same HVAC system type as described in
Section C409.6.1.1.1 item 2. Heat loss from ducts and pipes shall not be modeled.
Table C409.6.1.10.2(1) Proposed Building System Parameters are based on input of full-load equipment efficiencies with adjustment using part-load curves integrated in the simulation program. Where other approaches to part-load adjustment are used, it is permitted for specific input parameter to vary. The simulation program shall model part-load HVAC equipment performance using either:
1. Full-load efficiency adjusted for fan power input that is modeled separately and typical part-load performance adjustments for the proposed equipment.

2. Part-load adjustments based on input of both full-load and part-load metrics, or
3. Equipment-specific adjustments based on performance data provided by the equipment manufacturer for the proposed equipment.

Where multiple system components serve a thermal block, average values weighed by the appropriate metric as described in this section shall be used.

1. Where multiple fan systems serve a single thermal block, fan power shall be based on

weighted average using the design supply air cfm

2. Where multiple cooling systems serve a single thermal block, COP shall be based on a

weighted average using cooling capacity. DX coils shall be entered as multistage if more than 50 percent of coil capacity serving the thermal block is multi-stage with staged controls.

3. Where multiple heating systems serve a single thermal block, thermal efficiency or

heating COP shall be based on a weighted average using heating capacity.

...

TABLE C409.6.1.10.2(1) PROPOSED BUILDING SYSTEM PARAMETERS

Average minimum terminal unit airflow percentage for thermal block weighted by cfm or minimum required for outdoor air ventilation, whichever is higher.

Percent of thermal block floor area under occupied standby controls, ON/OFF only with occupancy sensor and no variable control

Percentage of thermal block floor area under variable DCV control (CO2); may include both variable and ON/OFF control

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C409.6.2.2 Thermal bBlocks Same as proposed design.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-195-22 Vertical fenestration energy credit
CDP ID #	876
Code	IECC CE
Code Section(s)	C406.2.1.6 Table
Location	base
Proponent	Thomas Culp culp@birchpointconsulting.com
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal updates the E06 additional energy credit to account for the shading projection factor when determining the maximum SHGC requirement.
Recommendation	Approve as modified (see attached modification)
Vote	8- Approve as modified, 2-Dissaprove, 1-Abstain
Recommendation Date	1/10/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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Modify CED1-195 as follows:

C406.2.1.6 E06 Improve fenestration. Energy credits for one selected fenestration energy credit ID shall be achieved for improved energy characteristics of all vertical fenestration in the project meeting the requirements in one of the rows of Table C406.2.1.6. The area-weighted average U-factor and SHGC of all vertical fenestration shall be equal to or less than the value shown in the selected table row. <u>Where vertical fenestration is located under a permanently attached shading projection with a projection factor PF not less than 0.2 as determined in accordance with Section C402.4.3, the SHGC for that fenestration shall be permitted to be divided by 1.2.</u> The area-weighted average visible transmittance (VT) of all vertical fenestration shall be equal to or greater than the value shown in the selected table row.

TABLE C406.2.1.6
Vertical Fenestration Requirements for Energy Credit E06

Applicable Climate Zone	Maximum U-Factor		Maximum SHGC[a]	Minimum VT
	Fixed	Operable		
0-2	0.45	0.52	0.21	0.28
3	0.33	0.44	0.23	0.30
4-5	0.31	0.38	0.34	0.41
6-7	0.26	0.32	0.38	0.44
8	0.24	0.28	0.38	0.44

~~a. Where vertical fenestration is located under a permanently attached shading projection with a projection factor PF not less than 0.2 as determined in accordance with Equation 4-4, the required maximum SHGC shall be multiplied by 1.2.~~