International Energy Conservation Code
Consensus Committee-Residential

Draft Meeting Agenda (6/27 posting)

Webex Meeting Link

June 30, 2022
12:00 PM EST to 5 PM EST (5 hours)

Committee Chair: JC Hudgison, CBO, Assoc. AIA
Committee Vice Chair: Bridget Herring & Robin Yochum, LEED Green Associate

1. Call to order.

2. Meeting Conduct.
   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.

4. Approve Agenda

5. Approval of Minutes

6. Administrative issues-

7. Subcommittee Reports

8. Action Items
   a. Code Change Proposals

IRCEPI-7-21(IRC version of REPI-79-21)	(Consensus as modified 38-6-1)
CEPI-255-21 Part II (Above energy code appdx	(Modeling disapprove 19-0)
REPI-20-21 (Add energy efficiency option)	(Modeling as modified 17-2)
REPI-122-21 (Performance Path	(Modeling as modified 10-8-1)
REPI-168-21 (Short energy code	(Modeling disapprove 19-0)
CEPI-12-21 Part II (Biomass definition)	(Electrical as modified 10/2)
REPI-7-21 (Solar Ready)	(Electrical as modified 11-1-0)

REPI-8-21 (Energy Storage Ready) (withdrawn in favor of REPI-115-21)
REPI-17-21 (Electrification) (Electrical as modified 6-4-1 HVACR disapprove 6-4)
REPI-70-21 (Demand Response) (Electrical as modified 8-4)
REPI-106-21 (Lighting interior controls) (Electrical as modified 9-1-0)
REPI-115-21 (Energy Storage Ready Req) (Electrical as modified 12-1-0)
REPI-137-21 (Add. Energy Eff. Credit on-site) (Electrical disapprove 10-0-1)
REPI-155-21 (Zero energy all electric) (Electrical as modified 7-3-0 HVACR disapprove 6-4)
RECPI-9-21 (EV proposals) (Electrical disapprove 9-1-2)
RECPI-11-21 (Appendix RC cleanup) (Electrical approve 12-0-0)

9. Other business.

10. Upcoming meetings. TBD

11. Adjourn.

FOR FURTHER IECC Residential INFORMATION BE SURE TO VISIT THE ICC WEBSITE:
IECC Residential Website

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

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

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	IRCEPI-07-21 IRC version of REPI-79-21 Ducts in Conditioned Space
CDP ID #	551
Code	IECC RE
Code Section(s)	R403.3.2 New Section n
Location	Base
Proponent	Craig Conner craig.conner@mac.com
Proposal Status	SC rev
Subcommittee	RE HVACR & WH
Subcommittee Notes	In a staff error this proposal should have been included at the time REPI-79-21 was heard by both the HVACR subcommittee and the consensus committee as this the IRC partner to that proposal. HVACR subcommittee approved as submitted REPI-79-21 12-0 at the April 4th meeting. The consensus committee approved with a modification to change the term "sealed" to "unvented" at the April 28th meeting with a vote of 38 yes 6 no 1 abstain.
Recommendation	To align with REPI-79-21 the recommendation would be to approve as modified by changing the term "sealed" to "unvented"
Vote	
Recommendation Date	4/4/2022
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee____yes _____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

IRCEPI-7-21

IRC: N1103.3.2

Proponents:
Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Building Science Corporation (joe@buildingscience.com)

THIS PROPOSAL WILL BE HEARD BY THE IECC-RESIDENTIAL COMMITTEE.

2021 International Residential Code

Revise as follows:

N1103.3.2 Ducts located in conditioned space.

For ductwork to be considered inside a *conditioned space*, it shall comply with one of the following:

- 1.

  The duct system is located completely within the *continuous air barrier* and within the *building thermal envelope.*

- 2.

  Ductwork in ventilated attic spaces or ~~sealed~~unvented attic with vapor diffusion port is buried within ceiling insulation in accordance with Section N1103.3.3 and all of the following conditions exist:

  – 2.1.

    The air handler is located completely within the *continuous air barrier* and within the *building thermal envelope*.

  – 2.2.

    The duct leakage, as measured either by a rough-in test of the ducts or a post-construction total system leakage test to outside the *building thermal envelope* in accordance with Section N1103.3.6, is less than or equal to 1.5 cubic feet per minute (42.5 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* served by the duct system.

  – 2.3.

    The ceiling insulation *R*-value installed against and above the insulated duct is greater than or equal to the proposed ceiling insulation *R*-value, less the *R*-value of the insulation on the duct.

- 3.

  Ductwork in floor cavities located over unconditioned space shall have the following:

  – 3.1.

    A *continuous air barrier* installed between unconditioned space and the duct.

  – 3.2.

    Insulation installed in accordance with Section N1102.2.7.

– 3.3.

A minimum R-19 insulation installed in the cavity width separating the duct from unconditioned space.

- 4.

Ductwork located within *exterior walls* of the *building thermal envelope* shall have the following:

– 4.1.

A *continuous air barrier* installed between unconditioned space and the duct.

– 4.2.

Minimum R-10 insulation installed in the cavity width separating the duct from the outside sheathing.

– 4.3.

The remainder of the cavity insulation fully insulated to the drywall side.

Reason:

Research done by the Department of Energy through the Building America Program shows that sealed attics with vapor diffusion ports significantly reduce the risk of condensation on ductwork. The existing IRC language allows sealed attics with vapor diffusion ports. This language makes it clear that the buried duct language for vented attics also applies to sealed attics with vapor diffusion ports.
Cost Impact:
The code change proposal will neither increase nor decrease the cost of construction.
This adds an option but not necessarily a cost.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	**CEPI-255-21 (Part II)** Green code above code appendix
CDP ID #	
Code	IECC-RE
Code Section(s)	New Appendix
Location	
Proponent	Hope Medina
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	The proponent was not available to attend the meeting but agreed to it being heard in her absence. After brief discussion a motion for disapproval was made and seconded based on concerns about the readiness of this proposal and potential gaps in requirements vs. the existing code pathways.
Recommendation	Motion to Disapprove as Submitted by Gayathri Vijaykumar, 2nd by Ben Edwards
Vote	**19-0 for Disapproval as Submitted (Unanimous)**
Recommendation Date	6-22-22
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 #	**REPI-020-21 (Mod June 22) R408 additional measures**
CDP ID #	
Code	IECC RE
Code Section(s)	R408
Location	base
Proponent	Dan Wildenhaus & Kevin Rose
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	This proposal was modified based on prior SC action on REPI-018 and REPI-126 to align with the points-based system in R408. The simplified proposal requires homes over 5,000 sf to achieve an additional 5% energy savings in R405 or 5 additional points in R408. Language edits were made by the SC to clarify the requirements and assist ICC staff in any needed reconciliation.
Recommendation	Motion to Approve as Modified by Gayathri Vijaykumar, Seconded by Ben Edwards
Vote	**17-2 for Approval as Modified (1 not present)**
Recommendation Date	6-22-22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____ X
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI-20-21 modification - 6/22/22

DELETE EVERYTHING FROM THE MONOGRAPH FOR REPI-20 AND SUBSTITUTE THE FOLLOWING:

R405.2 Performance- based compliance

Compliance based on total building performance requires that a *proposed design* meets all of the following:

[…]

3. An annual energy cost of the proposed design that is less than or equal to 90 percent of the annual energy cost of the *standard reference design* or the additional efficiency credits as required in Section R408.2 shall be installed without including such measures in the proposed design under Section R405. For buildings with greater than 5,000 square feet (465 m^2) of *conditioned floor area*, the annual energy cost of the *proposed design* shall be reduced by an additional 5 percent of annual energy cost of the *standard reference design.* […]

R408.2 Additional energy efficiency credit requirements. Two of the additional measures shall be selected from Table R408.2 that meet or exceed a total of ten credits. Five additional credits shall be selected for buildings with greater than 5,000 square feet (465 m^2) of *conditioned floor area.* Each measure selected shall meet the relevant subsections of Section R408 and receive credit as indicated in the Table for the specific Climate Zone. Interpolation of credits between measures shall not be permitted.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	**REPI-122-21 (Mod) Modify envelope table and add points to R408**
CDP ID #	
Code	IECC RE
Code Section(s)	R405 performance path
Location	base
Proponent	Vladimir Kochkin - NAHB
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	Initially recommended for disapproval by the SC, but disapproval motion failed at the full committee so REPI-122-21 was sent back to SC – and modified by the proponent. The modified REPI-122 changes the envelope backstop and increases trade-offs for mechanical equipment in return for modifying the % of energy savings required in R405. The proponent also agreed to support a further modification to include HRV/ERV requirements in the performance path where required in the prescriptive path.
Recommendation	Motion to Approve as Modified from Vladimir Kochkin, 2nd by Thomas Marston. This was a close vote in subcommittee.
Vote	**10-8 motion to approve as modified (1 abstain, 1 not present)**
Recommendation Date	6-22-22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee___X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Modification to REPI-122-21

Proponents: Vladimir Kochkin, NAHB, representing NAHB (vkochkin@nahb.org)

2021 International Energy Conservation Code

Revise as follows:

R401.2.5 Additional energy efficiency. This section establishes additional requirements applicable to all compliance approaches to achieve additional energy efficiency.

1. For buildings complying with Section R401.2.1, one of the additional efficiency package options shall be installed according to Section R408.2.

~~2. For buildings complying with Section R401.2.2, the building shall meet one of the following:~~

~~2.1. One of the additional efficiency package options in Section R408.2 shall be installed without including such measures in the proposed design under Section R405; or~~

~~2.2. The proposed design of the building under Section R405.3 shall have an annual energy cost that is less than or equal to 95 percent of the annual energy cost of the standard reference design.~~

~~3.~~ 2. For buildings complying with the Energy Rating Index alternative Section R401.2.3, the Energy Rating Index value shall be at least 5 percent less than the Energy Rating Index target specified in Table R406.5.

The option selected for compliance shall be identified in the certificate required by Section R401.3.

Revise as follows:

R405.2 Performance-based compliance. Compliance based on total building performance requires that a proposed design meets all of the following:

1. The requirements of the sections indicated within Table R405.2.

2. The proposed total building thermal envelope UA, which is the sum of *U*-factor times assembly area, shall be less ~~greater~~ than or equal to the building thermal envelope UA using the prescriptive *U*-factors from Table R402.1.2 multiplied by 1.15 in accordance with Equation 4-1. ~~levels of efficiency and solar heat gain coefficients in Table R402.1.1 or R402.1.3 of the 2009 International Energy Conservation Code.~~ The area-weighted maximum fenestration SHGC permitted in Climate Zones 0 through 3 shall be 0.30.

$UA_{Proposed\ design} \leq 1.15 \times UA_{Prescriptive\ reference\ design}$ -(Equation 4-1)

~~3. The proposed total building thermal envelope UA, which is the sum of U-factor times the assembly area shall be less than or equal to the UA of the building thermal envelope using the prescriptive U-factors from Table R402.1.4 multiplied by 1.15 in accordance with Equation 4-x1.~~

~~Equation 4-1: UAproposed design <=1.15 x UAprescriptive reference design.~~

3. For buildings without a fuel burning appliance for space heating or water heating, ~~An~~ the annual energy cost of the *proposed design* that is less than or equal to 85% of the annual energy cost of the *standard reference design*.

For buildings with a fuel burning appliance for space heating or water heating, the annual energy cost of the *proposed design* that is less than or equal to 80% of the annual energy cost of the *standard reference design*.

Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Data System Prices and Expenditures reports. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.

TABLE R405.4.2(1) (TABLE N1105.4.2(1)) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Portions of table not shown remain unchanged.

<table>
<tr><th>Building Component</th><th>Standard Reference Design</th><th>Proposed Design</th></tr>
<tr><td rowspan="8">Heating Systems [d, e, j, k]</td><td>~~For other than electric heating without a heat pump: as proposed. Where the proposed design utilizes electric heating without a heat pump, the standard reference design shall be an air source heat pump meeting the requirements of Section C403 of the IECC – Commercial Provisions.~~
~~Capacity: sized in accordance with Section R403.7.~~</td><td>~~As proposed~~</td></tr>
<tr><td>Fuel Type/Capacity: Same as proposed design</td><td>As proposed</td></tr>
<tr><td>Product class: Same as proposed design</td><td>As proposed</td></tr>
<tr><td>Efficiencies:</td><td>As proposed</td></tr>
<tr><td>Heat pump: Complying with 10 CFR §430.32 ~~(2021)~~</td><td>As proposed</td></tr>
<tr><td>Non-electric furnaces: Complying with 10 CFR §430.32 ~~(2021)~~</td><td>As proposed</td></tr>
<tr><td>Non-electric boilers: Complying with 10 CFR §430.32 ~~(2021)~~</td><td>As proposed</td></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="3">Cooling Systems [d, f, k]</td><td>~~As proposed.~~
~~Capacity: sized in accordance with Section R403.7.~~</td><td>~~As proposed~~</td></tr>
<tr><td>Fuel Type: Electric
Capacity: Same as proposed design</td><td>As proposed</td></tr>
<tr><td>Efficiencies: Complying with 10 CFR §430.32 ~~(2021)~~</td><td>As proposed</td></tr>
<tr><td rowspan="7">Service water Heating [d, g, k]</td><td>~~As proposed.~~
Use, in units of gal/day = 25.5 + (8.5 × N_{br})
where: N_{br}= number of bedrooms.</td><td>~~As proposed~~
Use, in units of gal/day = 25.5 + (8.5 × N_{br}) × (1 – $HWDS$)
where:
N_{br} = number of bedrooms.
$HWDS$ = factor for the compactness of the hot water distribution system.
<table>
<tr><th colspan="2">Compactness ratio[l] factor</th><th>HWDS</th></tr>
<tr><td>1 story</td><td>2 or more stories</td><td></td></tr>
<tr><td>> 60%</td><td>> 30%</td><td>0</td></tr>
<tr><td>> 30% to ≤ 60%</td><td>> 15% to ≤ 30%</td><td>0.05</td></tr>
<tr><td>> 15% to ≤ 30%</td><td>> 7.5% to ≤ 15%</td><td>0.10</td></tr>
<tr><td>< 15%</td><td>< 7.5%</td><td>0.15</td></tr>
</table></td></tr>
<tr><td>Fuel Type: Same as proposed design</td><td>As proposed</td></tr>
<tr><td>Rated Storage Volume: Same as proposed design</td><td>As proposed</td></tr>
<tr><td>Draw Pattern: Same as proposed design</td><td>As proposed</td></tr>
<tr><td>Efficiencies: Uniform Energy Factor complying with 10 CFR §430.32 ~~(2021)~~</td><td>As proposed</td></tr>
<tr><td>Tank Temperature: 120° F (48.9° C)</td><td>Same as standard reference design</td></tr>
<tr><td></td><td></td></tr>
</table>

<table>
<tr>
<td>Thermal distribution system</td>
<td>Duct insulation: in accordance with Section R403.3.1.

Duct location: ~~same as proposed design~~

<table>
<tr><th>Foundation Type</th><th>Slab on grade</th><th>Unconditioned crawlspace</th><th>Basement or conditioned crawlspace</th></tr>
<tr><td>Duct location (supply and return)</td><td>One-story building: 100% in unconditioned attic

All other: 75% in unconditioned attic and 25% inside conditioned space</td><td>One-story building: 100% in unconditioned crawlspace

All other: 75% in unconditioned crawlspace and 25% inside conditioned space</td><td>50% inside conditioned space

50% unconditioned attic</td></tr>
</table>

Duct system leakage to outside:

For duct systems serving > 1,000ft^2 of conditioned floor area, the duct leakage to outside rate shall be 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area.

For duct systems serving ≤ 1,000ft^2 of conditioned floor area, the duct leakage to outside rate shall be 40 cfm (1132.7 L/min).</td>
<td>Duct insulation: as proposed.

Duct location: as proposed.

Duct System Leakage to Outside:

The measured total duct system leakage rate shall be entered into the software as the duct system leakage to outside rate.

Exceptions:

1. When duct system leakage to outside is tested in accordance ANSI/ RESNET/ICC 380 or ASTM E1554, the measured value shall be permitted to be entered.
2. When total duct system leakage is measured without the air handler installed, the simulation value shall be 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area.</td>
</tr>
<tr>
<td></td>
<td>~~For all systems other than tested duct systems, a~~ For hydronic systems and ductless systems, a~~A~~ thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies. ~~for all systems other than tested duct systems~~.

~~Exception: For nonducted heating and cooling systems that do not have a fan, the standard reference design thermal distribution system efficiency (DSE) shall be 1.~~

~~For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area at a pressure of differential of 0.1 inch w.g. (25 Pa).~~</td>
<td>~~As tested or, where not tested,~~ For hydronic systems and ductless systems, DSE shall be as specified in Table R405.4.2(2).</td>
</tr>
</table>

g. For a proposed design ~~with a nonstorage-type water heater, a 40-gallon storage-type water heater having the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For a proposed design~~ without a proposed water heater, ~~a 40-gallon storage-type water heater having the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed~~ the following assumptions shall be made for both the proposed design and standard reference design.

Fuel Type: Same as the predominant heating fuel type

Rated Storage Volume: 40 Gallons

Draw Pattern: Medium

Efficiency: Uniform Energy Factor complying with 10 CFR §430.32

j. For a proposed design with electric resistance heating, a split system heat pump complying with 10 CFR §430.32 ~~(2021)~~ shall be ~~assumed~~ modeled in the standard reference design.

k. For heating systems, cooling systems, or water heating systems not included in Table R405.4.2(1), the standard reference design shall be the same as proposed design.

TABLE R405.4.2(2)
DEFAULT DISTRIBUTION SYSTEM EFFICIENCIES FOR PROPOSED DESIGNS[a]

DISTRIBUTION SYSTEM CONFIGURATION AND CONDITION	FORCED AIR SYSTEMS	HYDRONIC SYSTEMS[b]
Distribution system components located in unconditioned space	NA	0.95
~~Untested d~~Distribution system components entirely located in conditioned space [c]	~~0.88~~ NA	1
"Ductless" systems[d]	1	NA

Add new standard(s) as follows:

CHAPTER 6 [RE] REFERENCED STANDARDS

DOE

10 CFR, Part 430—2021: Energy Conservation Program for Consumer Products: Energy and Water Conservation Standards and their compliance dates.

Reason:
This modification aligns REPI-122 with other related proposals addressing UA allowance, revised duct requirements, and additional measures in R408.

Additional Modification to REPI-122 based on the request of the Econ, Modeling, Metrics Subcommittee

TABLE R405.4.2(1) (TABLE N1105.4.2(1)) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Portions of table not shown remain unchanged.

Air exchange rate	The mechanical ventilation rate shall be in addition to the air leakage rate and shall be the same as in the proposed design, but not greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ where: CFA = conditioned floor area, ft^2. N_{br} = number of bedrooms. The mechanical ventilation system type shall be the same as in the proposed design. Heat recovery or energy recovery shall ~~not~~ be modeled ~~assumed~~ for mechanical ventilation where required by Section R403.6.1. Heat recovery or energy recovery shall not be modeled for mechanical ventilation where not required by Section R403.6.1.	The mechanical ventilation rate[b] shall be in addition to the air leakage rate and shall be as proposed.

Reason:
This additional modification was requested by the Econ, Modeling, Metrics Subcommittee to address an oversight in the 2021 IECC where ERV/HRV were required in Climate Zones 7-8 for prescriptive design (Section R403.6.1), but were not added to the standard reference design case in Section R405.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	**REPI-168-21 New short code compliance pathway**
CDP ID #	
Code	IECC RE
Code Section(s)	New section/appendix
Location	base
Proponents	Craig Conner
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	Craig Conner proposed a similar approach in the 2018 code hearings. Unfortunately, he was not present at the 6-22 SC meeting, although he did attend a prior meeting and give a brief overview.
Recommendation	Motion to Disapprove by Jay Crandell, seconded by Ted Williams
Vote	**19-0 for Disapproval as Submitted (Unanimous)**
Recommendation Date	6-22-22
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 #	CEPI-012-21 Part II Biomass definition
CDP ID #	249
Code	IECC RE
Code Section(s)	R202 New Section n
Location	base
Proponent	Diana Burk diana@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	
Recommendation	Follow approval from commercial commercial committee Follow approval from commercial committee. Modification to remove comma between biofuel and feedstock
Vote	As modified 10-2
Recommendation Date	2.14.22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

CEPI-12-21 Part II

IECC®: SECTION 202 (New), SECTION 202

Proponents:
Diana Burk, representing New Buildings Institute (diana@newbuildings.org)

2021 International Energy Conservation Code

Add new definition as follows:

C202 BIOMASS WASTE.

Organic non-fossil material of biological origin that is a byproduct or a discarded product. Biomass waste includes municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural crop byproducts, straw, and other biomass solids, liquids, and biogases; but excludes wood and wood-derived fuels (including black liquor), biofuel feedstock, biodiesel, and fuel ethanol.

Revise as follows:

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, ~~landfill gas, biogas, biomass~~*biomass waste* or extracted from hot fluid or steam heated within the earth.

Reason:
There is currently no definition for biomass in the residential IECC even though biomass was recently listed as a potential renewable energy resource. Because there are many flavors of biomass, it is important for the IECC to clarify which forms of biomass energy count towards reducing a residential buildings' ERI score. The revision limits the biomass sources that count as renewable energy resources to those that are specified as waste products and ensures that virgin material of unknown origin does not count as a steady source of renewable energy. Without an available standard to cite in the IECC for sustainable biomass, it is critical to ensure that biomass used in compliance with the IECC is derived from waste products or byproducts. The definition of *biomass waste* is taken from the glossary of the Energy Information Administration. A similar amendment has been submitted to the commercial IECC to ensure the definition of renewable energy resources is consistent between the two codes.
Cost Impact:
The code change proposal will neither increase nor decrease the cost of construction.
This proposal clarifies the definition of renewable energy and will have no impact on construction costs.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-007-21 Solar Ready
CDP ID #	218
Code	IECC RE
Code Section(s)	R103.2.3 (New), R105.2.3, R105.2.5 (New), R105.2.5, (New), R401.3, R404.4 (New), R404.4.1 (New), R404.4.1.1 (New), R404.4.1.2 (New), R404.4.1.3 (New), R404.4.1.4 (New), R404.4.2 (New) New Section y
Location	base
Proponent	Kim Cheslak kim@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	A working group was put together to work through this proposal. One modification not included in this proposal came from Vladimir Kochkin modifying exception 4. Buildings with a renewable energy power purchase agreement with a duration of not less than 10 years from a utility or a community renewable energy facility and for a minimum of 80 percent of the estimated whole-building electric use on an annual basis. This proposed modification was not included in the motion by the subcommittee to approve as modified, but they will work with Vladimir during public comment.
Recommendation	Reason: this proposal requires homes to be solar-ready ensuring that future homeowners can cost effectively install solar energy at a later date.
Vote	Approve as modified 11-1-0
Recommendation Date	6/27/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	

Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI-7 Solar-Ready Requirement

SECTION R103

CONSTRUCTION DOCUMENTS

Add new text as follows:

R103.2.3 Solar-ready system. The construction documents shall provide details for dedicated roof area, structural design for roof dead and live load, and routing of conduit or pre-wiring from *solar-ready zone* to electrical service panel or plumbing from *solar-ready zone* to *service water heating* system. ~~for the *solar-ready zone* shall be represented on the construction documents~~.

SECTION R105

INSPECTIONS

Revise text as follows:

R105.2.3 Plumbing rough-in inspection. Inspections at plumbing rough-in shall verify compliance as required by the code and approved plans and specifications as to types of insulation and corresponding R-values and protection and required controls. Where required, ~~Where the solar-ready zone is installed for solar water heating,~~ inspections shall verify pathways for routing of plumbing from solar-ready zone to service water heating system.

Add new text as follows:

R105.2.5 Electrical rough-in inspection. Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system. Where the solar-ready zone is installed for electricity generation, inspections shall verify conduit or pre-wiring from solar-ready zone to electrical panel.

Revise numbering as follows:

~~**R105.2.5**~~ **R105.2.6 Final inspection.**

SECTION R202

GENERAL DEFINITIONS

Add new definition as follows:

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION R401

GENERAL

Revise text as follows:

R401.3 Certificate. A permanent certificate shall be completed by the builder or other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certification shall indicate the following:

8. Where a *solar-ready zone* is provided, the certificate shall indicate the location anddimensions.~~, and capacity reserved on the electrical service panel.~~

SECTION R404

ELECTRICAL POWER AND LIGHTING SYSTEMS

Add new text as follows:

R404.4 Renewable energy infrastructure. The building shall comply with the requirements of R404.4.1 or R404.4.2

R404.4.1 One- and two- family dwellings and townhouses. *Dwelling units* in one- and two-family dwellings and townhouses shall comply with Sections R404.4.1.1 through R404.4.1.4.

Exceptions:

1. A ~~*building*~~ *dwelling unit* with a permanently installed on-site renewable energy system.

3. A ~~*building* *dwelling unit*~~ with ~~a solar-ready zone area that is~~ less than ~~6~~500 square feet (~~55~~46 m^2) of roof area oriented between 110 degrees and 270 degrees of true north.

4. A ~~*building*~~ *dwelling unit* with a solar-ready zone area that is shaded for more than 70 percent of daylight hours annually.

5. A ~~*building*~~ *dwelling unit* that complies with Appendix RC

R404.4.1.1 Solar-ready zone area. The total area of the *solar-ready zone* shall not be less than ~~300 square feet (28 m^2)~~ 250 square feet (23.2 m^2) and shall be composed of areas not less than 5.5 feet (1676 mm) in one direction ~~width~~ and not less than 80 square feet (7.4 m^2) exclusive of access or set back areas as required by the International Fire Code.

Exception: Dwelling units in townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (186 m^2) per dwelling shall be permitted to have a solar-ready zone area of not less than 150 square feet (14 m^2).

R404.4.1.2 Obstructions. Solar-ready zones shall be free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

R404.4.1.3 Electrical service reserved space. The main electrical service panel shall have a reserved space for ~~to allow installation of~~ a dual pole circuit breaker ~~for future solar electric installation~~ and shall be labeled "For Future Solar Electric." The reserved space shall be ~~positioned~~ at the opposite (load) end of the busbar from the primary energy source.

R404.4.1.4 Electrical interconnection. An electrical junction box shall be installed within 24 inches (610 mm) of the main electrical service panel and shall be connected to a capped roof penetration sleeve or a location in the attic that is within 3 feet (914 mm) of the *solar ready zone* by a ~~one of the following~~ ~~1.~~ ~~M~~minimum 1-inch nonflexible metallic conduit or permanently installed wire as approved by the code official.~~2. Minimum #10 Metal copper 3 wire~~

Where the interconnection terminates in the attic, location shall be no less than 12" (35 mm) above ceiling insulation. Both ends of the interconnection shall be labeled "For Future Solar Electric".

R404.4.2 Group R occupancies. Buildings in Group R-2, R-3 and R-4 shall comply with Section C405.13.

SECTION R405

TOTAL BUILDING PERFORMANCE

Revise table as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Renewable energy infrastructure

SECTION R406

ENERGY RATING INDEX COMPLIANCE ALTERNATIVE

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Renewable energy infrastructure
R406.3	Building thermal envelope

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-017-21 Electrification
CDP ID #	188
Code	IECC RE
Code Section(s)	R401.2, R401.3, R402.4.4, R404.1.2, R408.2.2, R408.2.3 New Section y
Location	base
Proponent	Kim Cheslak kim@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	HVACR: On January 5 the HVACR subcommittee chair received a petition to hear REPI-155 and REPI-017. These proposals were originally assigned to a different subcommittee. The Chair discussed the request with Kristopher and with Mike Stone Chair of the electrification subcommittee. After detailed consideration the Chair of HVAC subcommittee agreed to hear both proposals as well as electrification.
Recommendation	Electrical SC reasons: REPI-17 is required to provide electrification options for fossil fueled space heating. This proposal is intended to advance President Biden's goal of reducing GHG emissions by 50% by 2030 and achieving net zero carbon emissions by 2050, by facilitating the transition away from use of fossil fuel combustion equipment in buildings. HVACR: The proponent Diana Burk presented for (NBI). Immediately we received a motion to Disapprove (Sonny Richardson) with Gary Heikkinen second. Steve Rosenstock question to the Proponent comparing the original Proposal to the modification the Modification appears to be completely different. Diana Burk answered that the modification has been completely rewritten compared to the original Proposal. Many members and interested parties spoke for and against. In the end the subcommittee voted 6/4/0 to Disapprove REPI-017 as modified
Vote	HVACR disapprove 6-4 on 6/6 Elect Power approve as modified 6-4-1
Recommendation Date	
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____

Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI- 17 (modified)

Add new text as follows:

R404.4.6 Combustion space heating. All fossil fuel space heating systems shall comply with the requirements of Sections 404.4.6.1 and 404.4.6.2

Exceptions:

1. Where an electrical circuit in compliance with IRC Section E3702.11 exists for space cooling equipment.

2. ~~Space heaters in a~~ Centralized space heating system serving multiple dwelling units in a R-2 occupancy that comply with C405.16.1.2

R404.4.6.1 Space heaters.
An individual branch circuit outlet in compliance with IRC Section E3702.11 based on heat pump space heating equipment sized in accordance with R403.7 shall be installed and terminate within three feet of each fossil fuel space heater.

R404.4.6.2 Condensate drainage.
A space that allows for natural drainage for condensate from cooling equipment operation or a condensate drain shall be located within 3 feet (914 mm) of the installed space heater.

Add new text as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION	TITLE

Electrical Power and Lighting Systems	
R404.4	Electric-readiness

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.4	Electric-readiness

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-070-21 Demand Response
CDP ID #	123
Code	IECC RE
Code Section(s)	R403.1.1, R403.5.4 New Section y
Location	base
Proponent	Jeremy Williams jeremy.williams@ee.doe.gov
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	Motion to disapprove failed 5-7. Concerns over cyber-security
Recommendation	Reason: Requiring thermostats to be demand response control capable enables homeowners to opt into utility demand response program, which can help save the homeowner money and improve grid resilience.
Vote	As modified 8-4
Recommendation Date	6/27/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI-70-21

IECC®: SECTION 202 (New), R403.1.1, R403.5.4 (New), CTA (New),

Proponents:

Jeremy Williams, representing U.S. Department of Energy (jeremy.williams@ee.doe.gov)

2021 International Energy Conservation Code

SECTION R202

GENERAL DEFINITIONS

Add new definitions as follows:

DEMAND RESPONSE SIGNAL. A signal that indicates a price or a request to modify electricity consumption for a limited time period.

DEMAND RESPONSIVE CONTROL. A control capable of receiving and automatically responding to a *demand response signal*.

SECTION R403

SYSTEMS

Revise text as follows:

R403.1 Controls. Not less than one thermostat shall be provided for each separate heating and cooling system. The primary heating or cooling system serving the dwelling unit shall comply with Sections R403.1.1 and R403.1.2.

R403.1.1 Programmable thermostat. The thermostat controlling the primary heating or cooling system of the dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature setpoints at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain

zone temperatures of not less than 55°F (13°C) to not greater than 85°F (29°C). The thermostat shall be programmed initially by the manufacturer with a heating temperature setpoint of not greater than 70°F (21°C) and a cooling temperature setpoint of not less than 78°F (26°C).

R403.1.2 Demand responsive thermostat. The thermostat shall be provided with a *demand responsive control* capable of communicating with the Virtual End Node (VEN) using a wired or wireless bi-directional communication pathway that provides the homeowner the ability to voluntarily participate in utility demand response programs, where available. The thermostat shall be 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).*
3. ~~*Increasing the cooling set point by a maximum of 4°F (2.2°C)*~~
4. ~~*Decreasing the heating set point by a maximum of 4°F (2.2°C)*~~

Thermostats controlling single stage HVAC systems shall comply with Section R403.1.2.1. Thermostats controlling variable capacity ~~and two-stage HVAC~~ systems shall comply with Section R403.1.2.2. Thermostats controlling multi-stage HVAC systems shall comply with either Section R403.1.2.1 or R403.1.2.2. Where~~n~~ a *demand* ~~*responsive*~~*response signal* is not available the thermostat shall be capable of performing all other functions.

Exception: ~~Health care and a~~Assisted living facilities.

R403.1.2.1 Single stage HVAC system controls. Thermostats controlling single stage HVAC systems shall be provided with a *demand responsive control* that complies with one of the following:

1. Certified OpenADR 2.0a VEN, as specified under Clause 11, Conformance
2. Certified OpenADR 2.0b VEN, as specified under Clause 11, Conformance
3. Certified by the manufacturer as being capable of responding to a *demand response signal* from a certified OpenADR 2.0b VEN by automatically implementing the control functions requested by the VEN for the equipment it controls
4. IEC 62746-10-1
5. The communication protocol required by a controlling entity, such as a utility or service provider, to participate in an automated demand response program
6. The physical configuration and communication protocol of CTA 2045-A or CTA-2045-B

R403.1.2.2 Variable capacity and two stage HVAC system controls. Thermostats controlling variable capacity and two stage HVAC systems shall be provided with a *demand responsive control* that complies with the communication and performance requirements of AHRI 1380.

SECTION R407

TROPICAL CLIMATE REGION COMPLIANCE PATH

Revise text as follows:

R407.2 Tropical climate region. Compliance with this section requires the following:

1. Not more than one-half of the *occupied* space is air conditioned and is controlled by a thermostat in accordance with Sections R403.1.1 and R403.1.2.

Add new standard(s) as follows:

Chapter 6 Referenced Standards New

AHRI

Air-Conditioning, Heating, & Refrigeration Institute

2111 Wilson Blvd, Suite 500

Arlington VA 22201

AHRI 1380-2019 Demand Response through Variable Capacity HVAC Systems in Residential and Small Commercial Applications

ANSI American National Standards Institute

25 West 43rd Street, 4th Floor

New York NY 10036

CTA

Consumer Technology Association Technology & Standards Department

1919 S Eads Street

Arlington, VA 22202

ANSI/CTA-2045-A – 2018 Modular Communications Interface for Energy Management

ANSI/CTA-2045-B – 2018: Modular Communications Interface for Energy Management

IEC

IEC Regional Centre for North America

446 Main Street 16th Floor

Worcester, MA 01608

IEC 62746-10-1 - 2018 Systems interface between customer energy management system and the power management system - Part 10-1: Open automated demand response

OpenADR

OpenADR Alliance

111 Deerwood Road

Suite 200

San Ramon, CA 94583

OpenADR 2.0a and 2.0b – 2019: Profile Specification Distributed Energy Resources

Reason Statement:

As buildings account for over 70% of U.S. electricity use, effectively managing their loads can greatly facilitate the transition towards a clean, reliable grid. Grid-interactive efficient buildings (GEBs) combine efficiency and demand flexibility with smart technologies and communication to provide occupant comfort and productivity while serving the grid as a distributed energy resource (DER). In turn, GEBs can play a key role in ensuring access to an affordable, reliable, sustainable and modern U.S. electric power system. Their national adoption

could provide $100-200 billion in U.S. electric power system cost savings over the next two decades. The associated reduction in CO_2 emissions is estimated at 6% per year by 2030.[1]

Building codes represent standard design practice in the construction industry and continually evolve to include advanced

technologies and innovative practices. Historically, national model energy codes establish minimum efficiency requirements for new construction.[2] Expanding codes to support GEB capabilities is a pivotal step towards realizing demand flexibility in support of a clean grid by addressing capabilities to improve interoperability between smart building systems, the grid, and renewable energy resources. Realizing GEBs requires buildings with automated demand response (DR) capabilities that enable standardized control, subject to explicit consumer consent, of energy smart appliances on an electricity network. This is achieved through communication between appliances and a controlling entity that is in communication with the consumer participants.

Energy codes can support DR communication standardization and advance the deployment of flexible load technologies such as smart home energy management systems, energy storage, behind-the-meter generation, and electric vehicles (EVs). Incorporating automated demand response capabilities in energy codes provides many benefits to consumers and society. Specifically, it matches intermittent renewable energy sources to building electric loads, decreases peak load on the electric grid, allows buildings to respond to utility price signals, supports electrical network reliability and market growth of products and processes aligned with clean economic growth.

The incorporation of DR into the model residential energy codes was considered for the 2021 International Energy Conservation Code (IECC) code development cycle. The scope of this proposal includes two strategies for DR in residential buildings: 1) smart thermostats with demand-responsive control and 2) electric water heating incorporating demand-responsive controls and communication.

[1] DOE (U.S. Department of Energy). 2021. A National Roadmap for Grid-Interactive Efficient Buildings. Washington DC. Accessed on June 9, 2021 at https://gebroadmap.lbl.gov/

[2] While advanced codes can be considered model codes, in this document, the term "model energy code" refers to the current published version of the International Energy Conservation Code-Residential and ASHRAE Standard 90.1, as those documents are referenced by Energy Conservation and Production Act as modified by the Energy Policy Act of 1992 as the minimum requirements for states adopting energy codes. https://www.govinfo.gov/content/pkg/USCODE-2011-title42/pdf/USCODE-2011-title42-chap81-subchapII.pdf.

[3] https://www.iccsafe.org/building-safety-journal/bsj-technical/co

Cost Impact:

After additional review of thermostat costs, we believe $200 to be a more accurate estimate of the maximum incremental cost for smart thermostats when compared to programmable thermostats. In addition, many utilities will provide a free thermostat or substantial rebate, to participate in a DR program.

The code change proposal will increase the cost of construction.

The costs associated with installing residential DR control strategies highlighted in this technical brief are discussed below. The

installed costs for smart thermostats and electric water heaters with DR control are modest and depend on the design of the home. The cost of a standard programmable thermostat required in the 2021 IECC ranges from $20 to $100 based on costs at local home improvement stores. A smart thermostat can range from $120 to $400 based on brand, model, and level of sophistication. The cost to install a programmable or smart thermostat ranges from $112 to $255, with the national average cost of $175. Thus, the incremental cost of upgrading from a standard programmable thermostat to a smart thermostat with DR controls is anywhere between $100 and $300.

Electric resistance water heaters supplied with CTA-2045 communication have been manufactured but are not widely available.

HPWHs have taken over the energy efficiency segment of the water heater market, and brands at local home improvement stores include the CTA-2045 communication ports. The average cost for a 50-gallon electric resistance heater is $400, while the average cost for a 50-gallon HPWH is $1,300 at local home improvement stores (Salcido et al. 2021). The incremental cost of $900 plus additional condensate removal equipment of $75 results in a total cost differential of $975. Therefore, for buildings already including HPWHs in the original design, the incremental increase in cost is $0. If the building specified an electric resistance water heater, the most straightforward way to implement the CTA-2045 communication for DR control is to switch to an HPWH with an incremental cost of $975.

While DR control functionality will reduce costs to utilities as well as electric costs to consumers, it is difficult to estimate or calculate the actual cost savings. DR will present cost-saving opportunities for buildings as more homeowners take advantage of time-of-use or realtime pricing controls as they become more widely available. Adding DR controls in model energy codes can help homeowners have the capability of participating in DR programs with alternative utility pricing structures whether they exist now or in the future. When DR requirements are part of the model energy code, it will not require homeowners or buildings.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-106-21 Lighting interior controls
CDP ID #	152
Code	IECC RE
Code Section(s)	R404.2 New Section n
Location	base
Proponent	Megan Hayes Megan.Hayes@nema.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	Combined elements of REPI-107-21 into this proposal which led proponent to withdraw REPI-107-21.
Recommendation	Reason: this proposal improves the requirements for interior lighting control by correcting terminology and providing different control allowances in habitable spaces versus other specific locations in residential occupancies.
Vote	As modified 9-1-0
Recommendation Date	6/27/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI-106-21
IECC®: SECTION 202 (New), R404.2, 404.2.1 (N1104.2.1) (New), 404.2.2 (N1104.2.2) (New)

Proponents: Megan Hayes, representing NEMA (Megan.Hayes@nema.org)

2021 International Energy Conservation Code

Add new definition(s) as follows:

~~**HABITABLE SPACE.** A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage, or utility spaces and similar areas are not considered habitable spaces.~~

Automatic Shut-off Control. A device capable of automatically turning loads off without manual intervention. Automatic shut-off controls include devices such as, but not limited to, occupancy sensors, vacancy sensors, door switches, programmable time switches (i.e., timeclocks), or count-down timers.

Revise as follows:

R404.2 (N1104.2) Interior lighting controls. All permanently installed luminaires ~~lighting fixtures~~ shall be controlled as required in 404.2.1 and 404.2.2. ~~with either a dimmer, an occupant sensor control or other control that is installed or built into the fixture.~~

Exception: Lighting controls shall not be required for ~~the following:~~ lighting designed for safety or security.

~~1. Bathrooms.~~

~~2. Hallways.~~

~~3. Exterior lighting fixtures.~~

~~4. Lighting designed for safety or security.~~

Add new text as follows:

404.2.1 (N1104.2.1) Habitable spaces. All permanently installed luminaires in habitable spaces shall be controlled with a dimmer or an ~~occupant sensor~~ *automatic shut-off control* that automatically turns off lights within 20 minutes after all occupants have left the space and shall incorporate a manual control to allow occupants to turn the lights on or off.

404.2.2 (N1104.2.2) Specific locations. All permanently installed luminaires in ~~bathrooms, hallways~~, garages, unfinished basements, laundry rooms, and utility rooms shall be controlled by an *automatic shut-off* ~~occupant sensor~~ *control* that automatically turns off lights within 20 minutes after all occupants have left the space and shall incorporate a manual control to allow occupants to turn the lights on or off.

Reason: This proposal extensively revises R404.2 to correct terminology and to clarify application of lighting controls in residential occupancies. The revised rule adds a separate lighting control requirement for habitable spaces that includes both automatic and non-automatic control function and adds automatic occupant sensor control only to specific, non-habitable spaces of a residence where lighting tends to remain on when no occupants are using the spaces, thus reducing energy conservation. The revised language also includes provisions to ensure the occupants can manually turn the lighting on and off independently of the occupant sensor control. Approval

of this proposal will more closely align R404.2 with C405.2 of the IECC and improve enforceability of the requirement.

Cost Impact: The code change proposal will increase the cost of construction. The code change proposal will increase the cost of construction by removing the four exempt spaces in the current rule but will also increase the effective use and conservation of energy consumed by lighting in residential occupancies.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-115-21 Energy Storage Ready Required
CDP ID #	539
Code	IECC RE
Code Section(s)	R404.5 (New), R404.5.1 (New), R404.5.2 (New), R404.5.3 (New) New Section y
Location	base
Proponent	Joe Cain JoeCainPE@gmail.com
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	Combined proposal with REPI-8-21 which will be withdrawn based upon approval as modified proposal
Recommendation	Reason: This proposal requires readiness for energy storage systems, to reduce future cost of retrofit of ESS, and improves opportunities for resilience by designating minimum required circuits for backup power during grid power outages.
Vote	As modified 12-1-0
Recommendation Date	6/27/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Add new definition as follows:

ENERGY STORAGE SYSTEM (ESS). One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time.

Add new text as follows:

R103.2.4 Energy storage-ready system.

The construction documents shall provide the location of pathways for routing of raceways or cable from the energy storage system ~~panelboard~~ to the electrical service panel, from the panelboard to dedicated branch circuits, the location and layout of a designated area for electrical energy storage system and system isolation equipment.

R105.2.5 Electrical rough-in inspection.

Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system.-Where the energy storage system area is not in the same space as the electrical panel, inspections shall verify conduit or pre-wiring from the energy storage ready zone to the electrical panel.

R404.4 (N1104.4) Electrical energy storage system. One- and two-family dwellings, townhouse units, and Group R-3 occupancies shall either comply with R404.4.1 or R404.4.2. Buildings with Group R-2 and R-4 occupancies shall comply with C405.15.

R404.4.1 Electrical energy storage energy capacity. Each building shall have a ESS with a minimum rated energy capacity of 5 kWh with a ~~minimum backed-up capacity of 60 amps and a~~ minimum of four ESS supplied branch circuits.

R404.4.2 Electrical energy storage system ready. Each building shall be energy storage ready area in accordance with Sections R404.4.2.1 through R404.2.2.4.

~~**R404.4.2.1 Energy Storage System Space.**~~
~~Space not less than 2.5 feet (762 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1207 of the International Fire Code and Section 110.26 of the NFPA 70 shall be reserved to allow for the future installation of an energy storage system.~~

R404.4.2.1 Energy Storage System Space.
Interior or exterior space with dimensions and locations in accordance with Section R328 of the International Residential Code and Section 110.26 of NFPA 70 shall be reserved to allow for the future installation of an energy storage system.

R404.4.2.2. System Isolation Equipment Space.
Space shall be reserved to allow for the future installation of a ~~system isolation equipment and~~ transfer switch within 3 feet (305 mm) of the main panelboard. Raceways shall be installed between the panelboard and the ~~system isolation equipment and~~ transfer switch location to allow the connection of an ESS..

R404.2.2.3. Panelboard with backed-up load circuits.
A dedicated raceway from the main service to a panelboard that supplies the branch circuits served by the ESS. All branch circuits are permitted to be supplied by the main service panel prior to the installation of an ESS. The trade size of the raceway shall be not less than one inch. The panelboard that supplies the branch circuits shall be labeled "Subpanel reserved for future battery energy storage system to supply essential loads."

R404.4.2.4 Branch circuits served by ESS. A minimum of four branch circuits shall be identified and have their source of supply collocated at a single panelboard supplied by the ESS. The following end uses shall be served by the branch circuits:

1. A refrigerator.
2. One lighting circuit near the primary egress.
3. A sleeping room receptacle outlet.

Add new text as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

Electrical Power and Lighting Systems	
R404.4	Electrical energy storage system ~~infrastructure~~

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

Electrical Power and Lighting Systems	
R404.4	Electrical energy storage system ~~infrastructure~~

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-137-21 Additional Energy Efficiency Credit On-Site Renewable
CDP ID #	320
Code	IECC RE
Code Section(s)	R408.2, R408.2.6 (New) New Section y
Location	base
Proponent	William Fay bill@energyefficientcodes.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	
Recommendation	Reason: request from proponent to disapprove proposal based upon the Consensus committee action taken on REPI-18-21
Vote	Disapprove 10-1-0
Recommendation Date	6/27/22
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 #	REPI-155-21 Zero Energy all electric
CDP ID #	187
Code	IECC RE
Code Section(s)	RC102 (New), (New), SECTION RC102, RC102.1, RC102.2, TABLE RC102.2 New Section y
Location	appendix
Proponent	Kim Cheslak kim@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	HVACR SC notes: Background; On January 5 the HVACR subcommittee chair received a petition to hear REPI-155 and REPI-017. These proposals were originally assigned to a different subcommittee. The Chair discussed the request with Kristopher and with Mike Stone Chair of the electrification subcommittee. After detailed consideration the Chair of HVAC agreed to hear both proposals as well as electrification
Recommendation	Electrical Power SC :provides optional appendix for jurisdictions wanting to put this regulation in place and provides consistent language. HVACR: The subcommittee received a motion and a second to approve but the motion did not pass with a vote of 4/6/0 Motion failed After continued discussion a motion and second was made to disapprove with a second the vote carried 6/4/1
Vote	Electrical Power approve as modified 7-3-0 HVACR disapprove 6-4-1
Recommendation Date	EPLRS 6/27/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI-155 (modified) shown to EPLRS subcommittee

Add new definitions in R202 as follows:

ALL-ELECTRIC BUILDING. A *building* that contains no *combustion equipment*, or plumbing for *combustion equipment,* installed within the *building* or *building site.*

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

COMBUSTION EQUIPMENT. Any *equipment* or *appliance* used for space heating, *service water heating*, cooking, clothes drying and/or lighting that uses *fuel gas* or *fuel oil*.

EQUIPMENT. Piping, ducts, vents, control devices and other components of systems

other than appliances that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.

FUEL GAS. A natural gas, manufactured gas, liquified petroleum gas or a mixture of these.

FUEL OIL. Kerosene or any hydrocarbon oil having a flash point not less than 100°F (38°C).

~~**MIXED-FUEL BUILDING.** A *building* that contains *combustion equipment* or includes piping for such *equipment*.~~

Add new Appendix as follows:

APPENDIX RX ALL-ELECTRIC RESIDENTIAL BUILDINGS

About this appendix: *Appendix RX requires the installation of all-electric equipment and appliances in new construction in order to reduce carbon emissions and improve the safety and health of residential buildings. Where adopted as a requirement, Section RX102.1 is intended to replace R401.2.*

Section RX101

GENERAL

RX101.1 Intent. The intent of this Appendix is to amend the *International Energy Conservation Code* to reduce greenhouse gas emissions and improve the safety and health of buildings by not permitting *combustion equipment* in buildings.

RX101.2 Scope. This appendix applies to new residential buildings.

Section RX102

ALL-ELECTRIC RESIDENTIAL BUILDINGS

RX102.1 Application. Residential buildings shall be *all-electric buildings* and comply with Section R401.2.5 and either Sections R401.2.1, R401.2.2, R401.2.3 or R401.2.4.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	RECPI-9-21 EV Ready
CDP ID #	
Code	IECC RE
Code Section(s)	New Section y
Location	base
Proponent	Elect Power Light Renewables Storage SC (Shane Hoeper)
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	
Recommendation	Reason: it is duplicative of RECPI-6 and RECPI-7 which were subcommittee EV consensus proposals.
Vote	Disapproved 9-1-2
Recommendation Date	6/27/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

RECPI-9-21

IECC®: SECTION 202 (New), R404.4 (New), R404.4.1 (New), R404.4.1.1 (New), R404.4.2 (New), R404.4.3 (New), R404.4.4 (New)

Proponents:
Mike Stone, representing IECC Residential Electrical Subcommittee (ieccreelectrical@iccsafe.org)

2021 International Energy Conservation Code

Add new definition as follows:

AUTOMOBILE PARKING SPACE. A space within a building or private or public parking lot, exclusive of driveways, ramps, columns, office and work areas, for the parking of an automobile.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and electric motorcycles, primarily powered by an electric motor that draws current from a building electrical service, *EVSE*, a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). Equipment for plug-in power transfer including the ungrounded, grounded and equipment grounding conductors, and the *electric vehicle* connectors, attached plugs, personal protection system and all other fittings, devices, power outlets or apparatus installed specifically for the purpose of tranferring energy between the premises wiring and the *electric vehicle*.

ELECTRIC VEHICLE SUPPLY EQUIPMENT INSTALLED SPACE (EVSE space). An *automobile parking space* that is provided with a dedicated EVSE connection

ELECTRIC VEHICLE CAPABLE SPACE (EV CAPABLE SPACE). A designated *automobile parking space* that is provided with electrical infrastructure, such as, but not limited to, raceways, cables, electrical capacity, and panelboard or other electrical distribution equipment space, necessary for the future installation of an *EVSE.*

ELECTRIC VEHICLE READY SPACE (EV READY SPACE). An *automobile parking space* that is provided with a branch circuit and either an outlet, junction box or receptacle, that will support an installed *EVSE.*

Add new text as follows:

R404.4 Electric Vehicle Power Transfer Infrastructure.

Automobile parking spaces shall be supplied with Electric Vehicle Power Transfer Infrastructure as described in R404.4.1-R404.4.3.

R404.4.1 Quantity.

The number of allocated, on-site parking spaces requiring *EVSE Installed* or be *EVSE Capable* shall be as follows:

Total Parking Spaces Provided in Parking Facilities	
EVSE Installed Spaces	10%-minimum 2
EV Capable Spaces	15%-minimum 2

R404.4.1.1 Accessible Parking Spaces.

If accessible parking spaces are provided, they shall be EVSE Installed or EVSE Capable in the same proportion as the parking facility as a whole-minimum 1.
These requirements shall not increase the total number of parking spaces. Where more than one parking facility is provided on a site, the number of spaces required shall be calculated separately for each parking facility.

Exception: One- and two-family dwellings and townhouses with onsite parking shall be provided with one EVSE Installed or EVSE Capable space per dwelling unit.

R404.4.2 EV Capable spaces.

Each *EV Capable Space* shall comply with the following:

- 1.

EV capable space.

A continuous raceway or cable assembly shall be installed between the electrical distribution equipment and a location within 3 feet (914 mm) of the designated

- 2.

The raceway or cable assembly shall be capable of supplying the loads specified in R404.4.4 and marked "Reserved for Future Electric Vehicle Supply Equipment (EVSE)".

R404.4.3 EV Installed spaces.

Each *EVSE* installed space shall comply with the following:

- 1.

EVSE shall be installed within 3 feet (914 mm) of the designated *EVSE* Installed Space.

The

R404.4.4 Minimum charging rate.

- 1.

EVSE shall be capable of charging at a rate not less than 6.6kVA per parking space.

The

- 2.

EVSE shall be capable of charging at a rate not less than 3.3kVA per parking space.

When served by an approved automatic load management system, the

Reason:

New electric vehicle (EV) sales totaled 488,000 in 2021 and are expected to increase to 2,000,000 by 2026 (Forbes 02/24/2022). The transition to EVs is happening quickly and new housing stock has to adapt to this trend. Currently, 11% of new car buyers are considering EVs.
Cost Impact:
The code change proposal will increase the cost of construction.
The code change proposal will increase the cost of construction.
EV Capable cost (new construction) - $750 (50' 8-3 NM, dual pole breaker, outlet, trim, labor)
EVSE Installed – EV Capable + $1000 (Level 2 charger, labor)

Installing the EV charging infrastructure post construction would probably double the installed cost. Additionally, installing the charging infrastructure at the time of construction will ensure the proper electrical service size thereby eliminating the need for costly upgrades in the future.

The charging infrastructure coupled with an EV may also be used to reduce costs for backup power systems and self-consumption of onsite photovoltaic generation.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	RECPI-11-21 Appendix RC cleanup
CDP ID #	
Code	IECC RE
Code Section(s)	New Section N
Location	appendix
Proponent	Elect Power Light Renewables Storage SC (Gayathri Vijayakumar)
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	
Recommendation	Reason: This proposal consolidates the zero-net sections which have been approved by the full consensus committee to date. It is located within the appendix. It has added additional code section references which are required which results in a more cohesive appendix.
Vote	As submitted 12-0-0
Recommendation Date	6/27/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

RECPI-11-21

Reason Statement: This member proposal combines approved proposals to Appendix RC for context, and then adds other beneficial edits to improve this Appendix and its adoptability by an AHJ by making it more similar to R406.

Cost Impact:

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

This proposal simply clarifies requirements and thus will result in no additional cost for compliance with the Appendix where adopted.

Underlined/strikeout shows text that changed compared to 2021 IECC (comments indicate which approved REPI created that change).

Yellow highlight shows if the change is from this RECPI.

2021 International Energy Conservation Code

Revise as follows:

SECTION R202

GENERAL DEFINITIONS

~~**COMMUNITY RENEWABLE ENERGY FACILITY.** A facility that produces harvested from *renewable energy resources* and is qualified as a community energy facility under applicable jurisdictional statutes and rules.~~

ENERGY RATING INDEX (ERI). A numerical integer value that represents the relative energy performance of a Rated Home as compared with the energy performance of the *ERI Reference Design,* where an ERI value of 100 represents the energy performance of the *ERI Reference Design* and an ERI value of 0 represents a home with zero net energy performance.

~~**FINANCIAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (FPPA).** A financial arrangement between a renewable electricity generator and a purchaser wherein the purchaser pays or guarantees a price to the~~

~~generator for the project's renewable generation. Also known as a "financial power purchase agreement" and "virtual power purchase agreement."~~

~~**PHYSICAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPPA).** A contract for the purchase of renewable electricity from a specific renewable electricity generator to a purchaser of renewable electricity.~~

APPENDIX RC

ZERO NET ENERGY RESIDENTIAL BUILDING PROVISIONS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User Note:

About this appendix: *This appendix provides requirements for residential buildings intended to result in ~~net~~ zero net energy consumption over the course of a year. Where adopted by ordinance as a requirement, Sections RC4~~1~~01.1, RC401.2, RC406.2, RC406.4, and RC406.5 ~~language is~~ are intended to replace Sections R401.1, R401.2, R406.2, R406.4, and R406.5, respectively. Where adopted by ordinance as a requirement, Sections R401.3 (Certificate), R406.1 (Scope), R406.3 (Building Thermal Envelope), R406.6 (Verification by approved agency) and R406.7 (Documentation) are not replaced.*

SECTION RC2~~1~~02

GENERAL DEFINITIONS

~~**COMMUNITY RENEWABLE ENERGY FACILITY (CREF) POWER PRODUCTION**. The yearly energy, in kilowatt hour equivalent (kWheq), contracted from a community renewable energy facility that is qualified under applicable state and local utility statutes and rules, and that allocates bill credits to the rated home.~~

COMMUNITY RENEWABLE ENERGY FACILITY (CREF). A facility that produces energy ~~harvested~~ from *renewable energy resources* and that is qualified as a community energy facility under applicable jurisdictional statutes and rules.

FINANCIAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (FPPA). A financial arrangement between a renewable electricity generator and a purchaser wherein the purchaser pays or guarantees a price to the generator for the project's renewable generation. Also known as a "~~financial~~ power purchase agreement" and "virtual power purchase agreement."

PHYSICAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT (PPPA). A contract for the purchase of renewable electricity from a specific renewable electricity generator by ~~to~~ a purchaser of renewable electricity.

~~**RENEWABLE ENERGY PURCHASE CONTRACT (REPC) POWER PRODUCTION**. The yearly energy, in kilowatt hour equivalent(kWheq), contracted from an energy facility that generates energy with photovoltaic, solar thermal, geothermal energy or wind systems, and that is demonstrated by an energy purchase contract or lease with a duration of not less than 15 years.~~

SECTION RC4~~1~~01

~~COMPLIANCE~~GENERAL

RC4~~1~~01.1 ~~Compliance~~Scope. ~~Existing residential buildings shall comply with Chapter 5. New residential buildings shall comply with Section RC102.~~ This appendix applies to new *residential buildings.*

RC401.2 Application.

Residential buildings shall comply with Section R406.

Exception: Additions, *alterations*, repairs and changes of occupancy to existing buildings complying with Chapter 5.

RC401.3 Certificate. [no change, same as R401.3]

SECTION ~~RC102~~RC406

ZERO NET ENERGY RESIDENTIAL BUILDINGS

~~**RC102.1 General.** New *residential buildings* shall comply with Section RC102.2.~~

RC406.1 Scope. [no change, same as R406.1]

RC406.2 ERI compliance. Compliance based on the ERI requires that the rated design meets one of the following:

1. The requirements of the sections indicated within Table R406.2 and sections R406.3 through R406.7, or

2. The requirements of ASHRAE/IES Standard 90.2, including:

   a. The ERI requirements of ASHRAE/IES 90.2 Table 6-1 without the use of on-site power production (OPP),

   b. The requirements of Sections R402.4.1.1, R402.4.1.2, R406.3, R404.4 (Electric Readiness), R404.4 (Electric Vehicle Power Transfer Infrastructure), and

   c. The maximum ERI including adjusted OPP of Table RC406.5 determined in accordance with RC406.4.

RC406.3 Building Thermal Envelope. [no change, same as R406.3]

RC~~102.2~~406.4 Energy Rating Index~~ zero energy score~~. The Energy Rating Index (ERI) not including *renewable energy resources* shall be determined in accordance with ANSI/RESNET/ICC 301.~~Compliance with this section requires that the *rated design* be shown to have a score less than or equal to the values in Table RC102.2 when compared to the Energy Rating Index (ERI) reference design determined in accordance with RESNET/ICC 301 for both of the following:1. ERI value not including on-site power production (OPP) calculated in accordance with RESNET/ICC 301.~~ The Energy Rating Index (ERI) including *renewable energy resources* shall be determined in accordance with ANSI/RESNET/ICC 301, except where electrical energy is provided from a *community renewable energy facility (CREF)* or contracted from a physical or financial renewable energy power purchase agreement that meets requirements of RC406.4.1, on-site power production (OPP) shall be adjusted in accordance with Equation 4-2.~~2. ERI value including on-site power production calculated in accordance with RESNET/ICC 301 with the OPP in Equation 4.1.2 of RESNET/ICC 301 adjusted in accordance with Equation RC-1.~~

$$\text{Adjusted OPP} = \text{OPP}_{kWh} + \text{CREF}_{kWh} + \text{~~REPC~~ PPPA}_{kWh} + \text{FPPA}_{kWh} \qquad \textbf{(Equation ~~RC-1~~ 4-2)}$$

where:

OPP_{kWh} = Annual electrical energy from *on-site renewable energy,* in units of kilowatt-hours (kWh).

$CREF_{kWh}$ = ~~Community Renewable Energy Facility power production — the yearly energy, in kilowatt hour equivalent (kWheq), contracted from a *community renewable energy facility* that is qualified under applicable state and local utility statutes and rules, and that allocates bill credits to the rated home.~~ Annual electrical energy from a *community renewable energy facility (CREF),* in units of kilowatt- hours (kWh).

~~REPC~~$PPPA_{kWh}$ = ~~Physical Renewable Energy Power Purchase Agreement Contract power production — the yearly energy, in kilowatt hour equivalent (kWheq), contracted from a *physical renewable energy power purchase agreement* an~~ energy facility ~~that generates energy with photovoltaic, solar thermal, geothermal energy or wind systems, and that is demonstrated by an energy purchase contract or lease with a duration of not less than 15 years.~~ Where not included as OPP, the annual electrical energy contracted from a *physical renewable energy power purchase agreement*, in units of kilowatt-hours (kWh).

$FPPA_{kWh}$ = ~~Financial Renewable Energy Power Purchase Agreement power production – the yearly energy, in kilowatt hour equivalent (kWheq) contracted from a financial renewable energy power purchase agreement with a duration of not less than 15 years.~~ Where not included as OPP, the annual electrical energy contracted from a *financial renewable energy power purchase agreement* (FPPA), in units of kilowatt-hours (kWh).

RC406.4.1 Power Purchase Agreement Contract. The renewable energy shall be delivered or credited to the building site under an energy contract with a duration of not less than 10 years. The contract shall be structured to survive a partial or full transfer of ownership of the building property.

RC406.5 ERI-based compliance.

Compliance based on an ERI analysis requires that the *rated proposed design* and confirmed built dwelling be shown to have an ERI less than or equal to both values indicated in Table RC406.5 when compared to the *ERI reference design*.

TABLE ~~RC102.2~~ RC406.5

MAXIMUM ENERGY RATING INDEX[a]

CLIMATE ZONE	ENERGY RATING INDEX NOT INCLUDING ~~OPP~~ RENEWABLE ENERGY	ENERGY RATING INDEX INCLUDING ADJUSTED OPP ~~(as proposed)~~
0	42	0
1	~~43~~ 42	0
2	~~45~~ 42	0
3	~~47~~ 42	0
4	~~47~~ 42	0
5	~~47~~ 42	0
6	~~46~~ 42	0

7	~~46~~ 42	0
8	~~46~~ 42	0

~~a. The building shall meet the requirements of Table R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or R402.1.3 of the 2015 International Energy Conservation Code.~~

~~**RC102.4 Renewable energy certificate (REC) documentation.** Where RECs are associated with *renewable energy* power production included in the calculation of ERI zero energy score the Energy Rating Index, documentation shall comply with Section R404.5.~~

RC406.6 Verification by approved agency. [no change, same as R406.6]

RC406.7 Documentation. [no change, same as R406.7]

Add new standard(s) as follows:

CHAPTER 6 [RE] REFERENCED STANDARDS

ASHRAE

ASHRAE/IES 90.2-2018: Energy-Efficient Design of Low-Rise Residential Buildings, Including approved addenda (Addenda A (approved Jan 2021), B (June 2021) and D (February 2022))