

**IECC RESIDENTIAL COMMITTEE ACTION REPORT ON THE
RESULTS ON THE 2022
PUBLIC COMMENTS/CODE CHANGES TO PUBLIC COMMENT DRAFT 1
TO THE INTERNATIONAL ENERGY CONSERVATION CODE RE-UPDATED 5/23/23**

Update May 23, 2023

Attached to this cover are updates to the previously issued IECC Residential Committee Action Report to properly align with the language acted on by the IECC Residential Consensus Committee. These include

RED1-43-22

RED1-91-22

RED1-112-22

RED1-268-22

RED1-89-22 (Added 5/23/23)

RED1-273-22 shows an update to the modification based on the correlation from proposal RED1-271-22.

As per the instructions provided in the CAR your electronic ballot must be submitted along with any comment/reason statement emailed to the Secretariat (kstenger@iccsafe.org) by **Tuesday, May 30 at 11:59 pm Pacific**. If you have further questions or issues with your ballot please contact the Secretariat.

RED1-43-22

IECC: R405.2

Proponents: Alisa McMahon, representing self (mcmahon.gbac@cox.net)

2024 International Energy Conservation Code [RE Project]

Revise as follows:

R405.2 Simulated performance 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 the U-factor times assembly area, shall be less than or equal to the building thermal envelope UA using the prescriptive U-factors from Table R402.1.2 multiplied by 1.08 in Climate Zones 0, 1, and 2, and 1.15 in Climate Zones 3 through 8 in accordance with Equation 4-2. The area-weighted maximum fenestration SHGC permitted in Climate Zones 0 through 3 shall be 0.30.

(Equation 4-2)

For Climate Zones 0-2: $UA_{\text{Proposed design}} \leq 1.08 \times UA_{\text{Prescriptive reference design}}$

For Climate Zones 3-8: $UA_{\text{Proposed design}} \leq 1.15 \times UA_{\text{Prescriptive reference design}}$

3. ~~For buildings without a fuel burning appliance for either space heating or water heating, the annual energy cost of the proposed design that is shall be less than or equal to 85 percent of the annual energy cost of the standard reference design.~~ For buildings with a one or more fuel burning appliance_s for space heating, or water heating, or both, the annual energy cost of the proposed design ~~that is shall be~~ less than or equal to 80 percent of the annual energy cost of the standard reference design. For all other buildings, the annual energy cost of the proposed design shall be less than or equal to 85 percent of the annual energy cost of the standard reference design. For dwelling units with greater than 5,000 square feet (465 m²) of living space floor area located above grade plane, 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. 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.

Exceptions:

1. The energy use based on source energy expressed in Btu or Btu per square foot of *conditioned floor area* shall be permitted to be substituted for the energy cost. The source energy multipliers for all energy sources shall be obtained from ASHRAE Standard 105 (Tables K2, K4, or K8) or from another data source approved by the *code official*.
2. The energy use based on site energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost for an all-electric building with on-site renewable energy installed.

Reason: The PCD #1 language creates a nonsensical situation where if one appliance is fuel burning and one is not, both sentences and both conditions apply: 85% and 80%. For the provision to make sense, the first sentence must make clear that no fuel burning appliances are present.

It doesn't work to say: "the annual energy cost that is . . ." The first two sentences have been changed to match the structure of the third sentence: "the annual energy cost shall be . . ."

There may be another proposal that addresses "buildings" versus "dwelling units" in this section.

Alternative Options (first two sentences only):

3. For buildings without a fuel burning appliance for space heating and without a fuel burning appliance for water heating, the annual energy cost of the proposed design shall be less than or equal to 85 percent 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 shall be less than or equal to 80 percent of the annual energy cost of the standard reference design.

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

Editorial change.

RED1-91-22

IECC: RP (New), RP101 (New), RP102 (New), RP103 (New), RP103.1 (New), RP103.1.1 (New), RP103.1.1.1 (New), RP103.2 (New), RP103.1.3 (New), TABLE RP103.1.3 (New)

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

2024 International Energy Conservation Code [RE Project]

Add new text as follows:

RP On-Site Renewable Energy

RP101 SCOPE. These provisions shall apply where on-site renewable energy is required.

RP102 GENERAL DEFINITION. POTENTIAL SOLAR ZONE AREA. The combined area of any steep-sloped roofs oriented between 90 degrees and 300 degrees of true north and any low-sloped roofs where the *annual solar access* is 70 percent or greater.

ANNUAL SOLAR ACCESS. The ratio of annual solar insolation with shade to the annual solar insolation without shade. Shading from obstructions located on the roof or any other part of the building are not included in the determination of *annual solar access*. Shading from existing permanent natural or person-made obstructions that are external to the building, including but not limited to trees, hills, and adjacent structures, are included in *annual solar access* calculations.

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

RP103 ON-SITE RENEWABLE ENERGY

RP103.1 General. Buildings shall comply with Section R401.2 and the requirements of this section.

RP103.1.1 Installed capacity. An on-site renewable energy system shall be installed on, or at the site of, the building with a peak rated capacity, measured under standard test conditions, in accordance with one of the following:

1. For one- and two- family dwellings, townhouses and other Group R-3 occupancies, the peak rated capacity shall be no less than 2kW.
2. For Group R-2 or R-4 residential buildings, the peak rated capacity shall be no less than 0.75 W/ft² multiplied by the gross conditioned floor area.
3. Where a building includes both commercial occupancies and R-2 or R-4 occupancies required to comply with this Code, the peak capacity shall be no less than 0.75 W/ft² multiplied by the gross conditioned floor area of the Group R-2 and R-4 occupancies.

The capacity of installed on-site renewable energy systems used to comply with this Appendix shall be in addition to the total capacity of installed on-site renewable energy systems used to comply with all other requirements of this Code.

Exceptions:

1. A building with a permanently installed domestic solar water heating system sized with a solar savings fraction of not less than 0.5 based on the total service water heating load of all residential occupancies.
2. One and two family dwellings, townhouses and other Group R-3 Occupancies in climate zone 4C, 5C or 8.
3. Group R-2 or R-4 occupancies in climate zone 8.
4. Buildings where the potential solar zone area is less than 300 square feet (28 m²).
5. Buildings with a physical renewable energy power purchase agreement with a duration of not less than 15 years from a utility or a community renewable energy facility and for not less than 80 percent of the estimated whole-building electric use on an annual basis. This exception shall not apply where off-site renewable energy credits are used to comply with the requirements of Section R408.
6. Buildings that demonstrate compliance in accordance with Section RP103.1.1.1

RP103.1.1.1 Alternate capacity determination. Where compliance is demonstrated in accordance with Section R405 Simulated Building Performance and the proposed design and standard reference design are adjusted in accordance with Items (1) and (2), the required capacity of the installed renewable energy systems shall be permitted to differ.

1. Proposed Design. Where applicable, the proposed design shall comply with one of the following:

1.1 Where one or more systems providing on-site renewable energy are included in the construction documents, the systems shall be modeled in the proposed design with a design capacity not greater than the required capacity in accordance with Section RP103.1.1. A combination of on-site renewable energy systems shall be permitted to be included in the proposed design.

1.2 Where no on-site renewable energy systems are specified in the construction documents, no on-site renewable energy systems shall be modeled in the proposed design.

2. Standard Reference Design. Where applicable, the standard reference design shall comply with one of the following:

2.1 Where a proposed design includes one or more on-site renewable energy systems the same systems shall be modeled identically in the standard reference design except the total rated capacity of all systems shall be equal to the required capacity in accordance with Section RP103.1.1. Where more than one type of on-site renewable energy system is modeled, the total capacity of each system shall be allocated in the same proportion as in the proposed design.

2.2 Where the proposed design does not include any on-site renewable energy systems, an unshaded photovoltaic system shall be modeled in the standard reference design in accordance with the performance criteria in Table RP103.1.1.1(1).

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RP103.2 Renewable energy certificate (REC) documentation. Where *RECs* are associated with *renewable energy* power production required by Section RP103.2 or RP103.3, documentation shall comply with Section R404.4 Renewable energy certificate (REC) documentation.

RP103.1.3 ERI With OPP Requirements. Where compliance is demonstrated in accordance with Section R406.5 using the Energy Rating Index With OPP, a project shall comply with the requirements of this Appendix if the rated proposed design and confirmed built dwelling are shown to have an ERI less than or equal to the values in Table RP103.1.3.

TABLE RP103.1.3 MAXIMUM ENERGY RATING INDEX INCLUDING OPP

<u>CLIMATE ZONE</u>	<u>ENERGY RATING INDEX WITH OPP</u>
<u>0-1</u>	<u>35</u>
<u>2</u>	<u>34</u>
<u>3</u>	<u>33</u>
<u>4</u>	<u>40</u>
<u>5</u>	<u>43</u>
<u>6</u>	<u>43</u>
<u>7 & 8</u>	<u>46</u>

Reason: On-site electricity generation using photovoltaics is a key technology for reducing greenhouse gas emissions associated with Commercial and Residential buildings. According to the most recent assessment by the National Renewable Energy Lab (NREL) the cost of installed photovoltaics in 2020 was 3% lower than in 2019 and 65-70% lower than the cost of similar sized systems in 2010. With the continued drop in cost of installing on-site PV the cost per kilowatt hour of PV generated electricity is at parity with grid purchased electricity in many States throughout the country. This proposal describes requirements for prescriptive solar PV that must be installed at the time of construction. Analysis by PNNL shows that on-site renewable electricity generation is cost effective across all low-rise multifamily buildings and most single family and one or two unit townhouses. The analysis was done using each of the Residential prototypes in each ASHRAE climate zone. The capacity requirements were established by calculating the highest on-site solar PV capacity that limited electricity export back to the grid. The threshold used for determining these capacities was a grid export limit of less than 0.5% of total annual building electricity consumption. A review of the hourly results showed it was unrealistic to set a hard limit of zero overproduction. When calculating cost effectiveness no credit was taken for electricity that was exported back to the grid. The calculation of grid exports was done on an hourly basis. The proposed requirements reduce purchased energy from the electrical grid which will help reduce green house gas emissions and energy costs for building owners.

PVs provide substantial benefits to the consumer and society by helping to reduce GHG emissions associated with electricity generation. PV market growth combined with a cleaner grid will support goals of reduced GHG emissions established across the U.S. and others by federal agencies, as well as many states and local governments.

This public comment is in direct response to the feedback provided by the full Residential Committee that REPI-114 be brought back as an optional Appendix.

Cost Impact: The code change proposal will increase the cost of construction.

PNNL prepared a cost effectiveness analysis of the proposed changes as part of the original REPI-114 submission in October 2021. This original analysis of residential building solar PV cost effectiveness was calculated using the Life Cycle Cost methodology established by Pacific Northwest National Lab for determining National and State cost effectiveness of the 2021 International Energy Conservation Code. The DOE methodology accounts for the benefits of energy-efficient home construction over the life of a typical mortgage, balancing initial costs against longer term energy savings. The Life-Cycle Cost methodology provides a full accounting over a 30-year period of the cost savings, considering energy savings, the initial investment financed through increased mortgage costs, tax impacts, and residual values of energy efficiency measures. The installed cost of solar PV was based on costs reported in the U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020 published by NREL in 2021. Installed costs were scaled based on solar PV capacity from 2kW up to 200kW and applied based on the calculated capacity required for each prototype in each climate zone. The proposed solar PV capacities were shown to be cost effective for R occupancies in each ASHRAE climate zone except for climate zone 8 and for single family residences in all climate zones except 4C, 5C and 8. An updated analysis was provided to the full committee in May 2022 using the IECC Residential cost effectiveness methodology. The results of that analysis by climate zone are provided below. The analysis has not been updated to reflect any change in the national average cost of small-scale renewables or to capture the impact of the Inflation Reduction Act passed in November 2022 that included renewable tax credits through 2032.

Single Family Dwellings	1A	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
PV Capacity (kW)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
PV Generation (kWh)	3,189	3,082	3,480	3,000	3,651	3,458	2,669	3,593	2,304	2,510	3,154	2,355	2,611	2,775	2,444	1,885
PV Cost @ 3.55	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100	\$ 7,100

IECC Cost effectiveness @ \$3.55 per Watt																
3.84% Real w/o SCC	\$2,956	\$2,617	\$3,881	\$2,356	\$4,424	\$3,811	\$1,305	\$4,239	\$146	\$800	\$2,845	\$308	\$1,121	\$1,642	\$591	(\$1,185)
3% Real w/o SCC	\$2,164	\$1,884	\$2,927	\$1,669	\$3,374	\$2,869	\$802	\$3,223	(\$154)	\$386	\$2,073	(\$20)	\$650	\$1,080	\$213	(\$1,251)
7% Real w/o SCC	\$871	\$692	\$1,358	\$555	\$1,645	\$1,321	\$0.30	\$1,547	(\$611)	(\$266)	\$812	(\$525)	(\$97)	\$178	(\$376)	(\$1,312)
3.84% Real w/ SCC	\$4,542	\$4,149	\$5,611	\$3,848	\$6,239	\$5,531	\$2,632	\$6,026	\$1,292	\$2,048	\$4,414	\$1,479	\$2,419	\$3,022	\$1,806	(\$247)
3% Real w/ SCC	\$3,750	\$3,417	\$4,657	\$3,161	\$5,190	\$4,589	\$2,130	\$5,009	\$992	\$1,634	\$3,641	\$1,151	\$1,949	\$2,460	\$1,428	(\$314)
7% Real w/ SCC	\$2,457	\$2,225	\$3,089	\$2,047	\$3,460	\$3,041	\$1,328	\$3,334	\$535	\$982	\$2,381	\$646	\$1,202	\$1,558	\$839	(\$375)

Low-Rise Multifamily	1A	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
PV Capacity (kW)	16.22	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
PV Generation (kWh)	25,921	25,050	28,286	24,388	29,675	28,108	21,699	29,208	18,728	20,403	25,634	19,145	21,221	22,554	19,863	15,322
PV Cost @ 2.26/W	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673	\$ 36,673

IECC Cost effectiveness @ \$2.26 per Watt																
3.84% Real w/o SCC	\$45,279	\$42,513	\$52,789	\$40,410	\$57,201	\$52,224	\$31,871	\$55,717	\$22,436	\$27,755	\$44,367	\$23,760	\$30,353	\$34,586	\$26,040	\$11,619
3% Real w/o SCC	\$35,929	\$33,648	\$42,124	\$31,914	\$45,762	\$41,658	\$24,871	\$44,539	\$17,089	\$21,476	\$35,177	\$18,181	\$23,619	\$27,110	\$20,062	\$8,167
7% Real w/o SCC	\$20,320	\$18,862	\$24,280	\$17,753	\$26,606	\$23,982	\$13,251	\$25,824	\$8,276	\$11,081	\$19,840	\$8,975	\$12,451	\$14,683	\$10,177	\$2,574
3.84% Real w/ SCC	\$58,170	\$54,971	\$66,857	\$52,539	\$71,959	\$66,203	\$42,663	\$70,244	\$31,750	\$37,902	\$57,116	\$33,281	\$40,907	\$45,803	\$35,919	\$19,239
3% Real w/ SCC	\$48,821	\$46,106	\$56,192	\$44,043	\$60,521	\$55,637	\$35,662	\$59,065	\$26,403	\$31,623	\$47,926	\$27,702	\$34,173	\$38,327	\$29,940	\$15,788
7% Real w/ SCC	\$33,212	\$31,320	\$38,348	\$29,883	\$41,364	\$37,961	\$24,043	\$40,350	\$17,591	\$21,228	\$32,589	\$18,496	\$23,005	\$25,900	\$20,056	\$10,194

The installed cost of photovoltaic systems was based on published NREL cost data that was further adjusted to account for streamlined permitting under the NREL SolarApp+ program and to account for differences between retrofit and new construction costs. A cost of \$3.55 per installed watt was used for 2kW array capacity and \$2.26 per installed watt was used for a 16kW array capacity.

RED1-112-22

IECC: R404.3

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

2024 International Energy Conservation Code [RE Project]

Revise as follows:

R404.3 Exterior lighting controls. Exterior lighting ~~controlled from within individual dwelling units~~ controls shall comply with Section R404.3.1. ~~Controls for all other exterior lighting shall comply with Sections C405.2.7 of the International Energy Conservation Code — Commercial Provisions instead of Section R404.3.1.~~

Reason: Section R101.5 clearly requires that residential buildings comply with the IECC-R rather than the IECC- commercial provisions. The original proponent of this section should do the work of incorporating the actual requirements for the benefit of the code user instead of referencing a code that may not be adopted.

Cost Impact: The code change proposal will neither increase nor decrease the cost of construction. There will be no impact if the original proponent actually brings the requirements into the body of the code.

RED1-268-22

IECC: SECTION 202, R503.1.1, R503.1.1.1, R503.1.1.2, R503.1.1.3, R503.1.1.4, R503.1.1.5, R503.1.1.6, TABLE R402.1.2, TABLE R402.1.3

Proponents: Jay Crandell, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz); Greg Johnson, representing National Multifamily Housing Council (gjohnsonconsulting@gmail.com)

2024 International Energy Conservation Code [RE Project]

Revise as follows:

APPROVED SOURCE. An independent person, firm or corporation, approved by the code official, who is competent and experienced in the application of engineering principles to materials, methods or system analyses.

R503.1.1 Building thermal envelope. Alterations of existing *building thermal envelope* assemblies shall comply with this section. New ~~Building~~ *building thermal envelope* assemblies that are part of the *alteration* shall comply with Section R402. ~~In no case shall the~~ The *R-value* of insulation shall not be reduced, nor the *U-factor* of a *building thermal envelope* assembly be increased as part of a *building thermal envelope* alteration except where the building after the alteration complies with Section R405 or R406.

Exception: The following alterations shall not be required to comply with the requirements for new construction provided that the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Roof recover.
3. Surface-applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided that the code does not require the glazing or fenestration assembly to be replaced.
4. Roof replacement where roof assembly insulation is integral to or located below the structural roof deck. An existing building undergoing alterations that is demonstrated to be in compliance with Section R405 or Section R406

R503.1.1.1 Fenestration alterations. Where new fenestration area is added to an existing building, the new fenestration shall comply with Section R402.3. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U-factor* and SHGC as specified in Table R402.1.3. Where more than one replacement fenestration unit is to be installed, an area-weighted average of the *U-factor*, SHGC or both of all replacement fenestration units shall be an alternative that can be used to show compliance.

Revise as follows:

R503.1.1.2 Roof, ceiling, and attic alterations. ~~Roof insulation~~ Insulation shall comply with Section R402.1. Alternatively, where limiting conditions prevent compliance with Section R402.1, or an approved design that minimizes deviation from Section R402.1 shall be provided for the following alterations; roof alteration conditions as applicable:

1. An alteration to roof-ceiling construction other than *reroofing* where existing there is no insulation located below the roof deck or on an attic floor above conditioned space does not comply with Table R402.1.3.
2. Roof replacements or a roof for roofs with alteration that includes removing and replacing the roof covering where the roof assembly includes insulation entirely above the roof deck. Where limiting conditions require use of an approved design to minimize deviation from Section R402.1 for a Group R-2 building, a registered design professional or other approved source shall provide construction documents that identify the limiting conditions and the means to address them.
3. Conversion of an unconditioned attic space into conditioned space.
4. Replacement of ceiling finishes exposing cavities or surfaces of the roof-ceiling.

Exceptions: Where compliance with Section R402.1 cannot be met due to limiting conditions on an existing roof, the following shall be permitted to demonstrate compliance with the insulation requirements:

1. ~~Construction documents that include a report by a registered design professional or other approved source documenting details of the limiting conditions affecting compliance with the insulation requirements.~~
2. ~~Construction documents that include a roof design by a registered design professional or other approved source that minimize deviation from the insulation requirements.~~
3. ~~Conversion of an unconditioned attic space into conditioned space, and~~
4. ~~Replacement of ceiling finishes exposing cavities or surfaces of the roof-ceiling construction to which insulation can be applied.~~

R503.1.1.3 Above-grade wall alterations. Above-grade wall alterations shall comply with the following requirements as applicable:

1. Where interior finishes are removed exposing wall cavities are exposed, the existing cavity cavities shall be filled with existing or new insulation complying with Section R303.1.4; . New cavities created shall be insulated in accordance with Section R402.1 or an approved design that minimizes deviation from Section R402.1.
2. Where exterior wall coverings and fenestration are added or removed and replaced for the full extent of any exterior wall assembly facade of one or more elevations of the building, continuous insulation shall be provided where required in accordance with one of the following: Section R402.1 or an approved design;

2.1. An R-value of continuous insulation not less than that designated in Table R402.1.3;

2.2. An R-value of continuous insulation not less than that required to comply with Table R402.1.2; or

2.3. An approved design that minimizes deviation from Section R402.1.

3. Where Items 1 and 2 apply, the entire wall assembly shall be insulated insulation shall be provided in accordance with Section R402.1; and,
4. Where new interior finishes or exterior wall coverings are applied to the full extent of any exterior wall assembly of mass construction, insulation shall be provided where required in accordance with Section R402.1 or an approved design.

Where any of the above requirements are applicable, the above-grade wall alteration shall comply with the insulation and water vapor retarder requirements of Section s R702.7 and R703.1.1 of the International Residential Code. Where the exterior wall coverings are removed and replaced, the above-grade wall alteration shall comply with the water and wind resistance requirements of Section R703.1.1 of the International Residential Code.

R503.1.1.4 Floor alterations. Where cavities in a floor or floor overhang are exposed an alteration to a floor or floor overhang exposes cavities or surfaces to which insulation can be applied and the floor or floor overhang is part of the building thermal envelope, the floor or floor overhang shall comply be brought into compliance with Section R402.1 or an approved design. This requirement shall apply to floor alterations where the floor cavities or surfaces are exposed and accessible prior to construction.

R503.1.1.5 Below-grade wall alterations. Where unconditioned a b below-grade space is changed to conditioned space, the below-grade building thermal envelope walls enclosing such space shall be insulated where required in accordance with Section R402.1. Where the below-grade space is conditioned space and where a below-grade building thermal envelope wall s enclosing such space are is altered by removing or adding interior finishes, they # shall be insulated where required in accordance with Section R402.1.

R503.1.1.6 Air barrier. Altered B building thermal envelope assemblies altered in accordance with Section R503.1.1 shall be provided with an air barrier in accordance with Section R402.5. The Such air barrier shall need not be required to be made continuous with unaltered portions of the building thermal envelope. Testing requirements of Section R402.5.1.2 shall not be required. Content

TABLE R402.1.2 MAXIMUM ASSEMBLY U-FACTORS^a AND FENESTRATION REQUIREMENTS

Portions of table not shown remain unchanged.

CLIMATE ZONE	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4 except Marine</u>	<u>5 and Marine 4</u>	<u>6</u>	<u>7 and 8</u>
Insulation entirely above roof deck	<u>0.039</u>	<u>0.039</u>	<u>0.039</u>	<u>0.039</u>	<u>0.032</u>	<u>0.032</u>	<u>0.032</u>	<u>0.028</u>

For SI: 1 foot = 304.8 mm.

- a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
- b. Mass walls shall be in accordance with Section R402.2.6. Where more than half the insulation is on the interior, the mass wall *U*-factors shall not exceed 0.17 in Climate Zones 0 and 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.057 in Climate Zones 6 through 8.
- c. In Warm Humid locations as defined by Figure R301.1 and Table R301.1, the basement wall *U*-factor shall not exceed 0.360.
- d. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

Exception: In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.28.

- e. A maximum *U*-factor of 0.30 shall apply in Marine Climate Zone 4 and Climate Zones 5 through 8 to vertical fenestration products installed in buildings located either:
 - 1. Above 4,000 feet in elevation above sea level, or
 - 2. In windborne debris regions where protection of openings is required by Section R301.2.1.2 of the *International Residential Code*.
- ~~f. Roofs with insulation entirely above deck shall comply with Section C402.2.1 and the Group R U-factors of Table C402.1.2.~~
- ~~g. f.~~ F-factors for heated slabs correspond to the configuration described by footnote (d) of Table R402.1.3

TABLE R402.1.3 INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT^a

Portions of table not shown remain unchanged.

CLIMATE ZONE	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4 except Marine</u>	<u>5 and Marine 4</u>	<u>6</u>	<u>7 and 8</u>
Insulation entirely above roof deck	R-25ci	R-25ci	R-25ci	R-25ci	R-30ci	R-30ci	R-30ci	R-35ci

For SI: 1 foot = 304.8 mm.

NR = Not Required.

ci = continuous insulation.

- a. *R*-values are minimums. *U*-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall be not less than the *R*-value specified in the table.
- b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

Exception: In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.28.

- c. "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.
- d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation *R*-value for slabs. as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.
- e. Basement wall insulation is not required in Warm Humid locations as defined by Figure R301.1 and Table R301.1.
- f. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13&5" means R-13 cavity insulation plus R-5 continuous insulation.
- g. Mass walls shall be in accordance with Section R402.2.6. The second *R*-value applies where more than half of the insulation is on the interior of the mass wall.
- h. A maximum *U*-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located either:
 - 1. Above 4,000 feet in elevation, or
 - 2. In windborne debris regions where protection of openings is required by Section R301.2.1.2 of the *International Residential Code*.
- ~~i. Roofs with insulation entirely above deck shall comply with Section C402.2.1 and the Group R-R values of Table C402.1.2.~~
- ~~j. "30 or 19+7.5ci or 20ci" means R30 cavity insulation alone or R19 cavity insulation with R7.5 continuous insulation or R20 continuous insulation alone.~~

Reason: This PC is submitted to coordinate with changes made by CEPI-221 to Section C503.1 of the commercial provisions based on additional input and review by the commercial subcommittee that occurred after the residential existing buildings and main committees had completed action on REPI-150. The two proposals intended to make the two codes consistent. So, this proposal is primarily one of editorial and formatting coordination between the IECC-C and IECC-R. It is not intended to make any technical requirement changes.

This PC also addresses a modification made to REPI-150 to provide direction for insulation entirely above the roof deck as it relates to roof replacement requirements. REPI-150 added a footnote 'f' to the *U*-factor and *R*-value tables to point to the commercial tables for Group R buildings for appropriate criteria since this specific roof condition (low slope roof with insulation entirely above deck) was not specifically addressed in the residential provisions. Rather than rely on a footnote pointing to IECC-C provisions for requirements, the relevant requirements are proposed to be brought directly into the *R*-value and *U*-factors tables of the IECC-R.

Finally, the following additional revisions were made to R503.1.1: (1) various editorial and formatting changes or corrections were made to simplify and improve clarity, (2) the "approved source" definition which was added by REPI-150 is now deleted preferring instead to use the term "approved third party" for consistency with this term's use in the air leakage and ERI provisions, (3) the additional approved third-party and construction document requirements which previously existed in an exception are made a part of the requirements for roof replacements with insulation entirely above deck and limited to Group R-2 buildings (e.g., apartments) which addresses the primary application and need for consistency with similar building types addressed in the IECC-C provisions. Roofs with above-deck insulation on other types of residential buildings (e.g., one- and two-family, townhouses, etc.) would comply with the changing language of Section R503.1.1.2 (allowing an approved design without additional requirement for a third party and construction documents).

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

The proposal does not change requirements and focuses on editorial and formatting improvements to coordinate with similar provisions in the IECC-C. Therefore, there should be no cost impacts.

RED1-89-22

IECC: RC103.3, RC103.3.1

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

2024 International Energy Conservation Code [RE Project]

Revise as follows:

RC103.3 Energy Rating Index zero net energy score. The Energy Rating Index (ERI) not including renewable energy resources shall be determined 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 RC-1.

(Equation RC-1)

$$\text{Adjusted OPP} = \text{OPP}_{\text{kWh}} + \text{CREF}_{\text{kWh}} + \frac{\text{CL}_{\text{years}}}{15} (\text{PPPA}_{\text{kWh}} + \text{FPPA}_{\text{kWh}})$$

where:

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

CREF_{kWh} = Annual electrical energy from a community renewable energy facility (CREF), in units of kilowatt-hours (kWh).

PPPA_{kWh} = 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} = 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).

RC103.3.1 ~~Power purchase agreement~~ Renewable energy 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~~ 15 years. The contract shall be structured to survive a partial or full transfer of ownership of the building property.

Reason: This amendment creates greater equivalence between the amount of power procured by an off-site renewable energy contract and that provided throughout the life of an on-site renewable energy system, which can operate for up to 25-30 years. It requires buildings with contract lengths shorter than 15 years to purchase the same amount of power over the shorter contract length as would be purchased in a 15-year contract or produced in 15 years by an onsite system. This approach parallels the draft commercial 2024 IECC which requires building owners with contract lengths between 10 and 15 years to procure an equivalent total amount of renewable energy as building owners with a 15-year contract. Finally, this amendment amends the section title to be consistent with a similar section title in the commercial IECC.

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

RED1-273-22

IECC: R503.1.1.3

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

2024 International Energy Conservation Code [RE Project]

Revise as follows:

R503.1.1.3 Above-grade wall alterations. Above-grade wall alterations shall comply with the following requirements as applicable:

1. Where interior finishes are removed ~~exposing and~~ wall cavities are exposed, the ~~existing cavity~~ exposed cavities shall be filled with existing or new insulation complying with Section R303.1.4 and an interior vapor retarder shall be provided where required in accordance with Section R702.7 of the *International Residential Code* or Section 1404.3 of the *International Building Code*, as applicable;
2. Where exterior wall coverings and fenestration are removed and replaced for the full extent of any exterior wall assembly, continuous insulation shall be provided where required in accordance with Section R402.1 or the wall insulation shall be in accordance with an approved design that minimizes deviation from Section R402.1; Where specified, the continuous insulation requirement also shall comply with Section R702.7 of the *International Residential Code*. Replacement exterior wall coverings shall comply with the water resistance requirements of Section R703.1.1 of the *International Residential Code* or Section 1402.2 of the *International Building Code*, as applicable, and manufacturers' instructions.
- ~~3. Where Items 1 and 2 apply, the entire wall assembly shall be insulated in accordance with Section R402.1; and,~~
- ~~4.~~ 3. Where new interior finishes or exterior wall coverings are applied to the full extent of any exterior wall assembly of mass construction, insulation shall be provided where required in accordance with Section R402.1 or an approved design that minimizes deviation from Section R402.1.

~~Where any of the above requirements are implemented applicable and resulted in a change of the vapor retarder classification, the above-grade wall alteration shall comply with the insulation and water vapor retarder requirements of Section R702.7 of the *International Residential Code*. Where the exterior wall coverings are removed and replaced, the above-grade wall alteration shall comply with the water and wind resistance requirements of Section R703.1.1 of the *International Residential Code*.~~

Reason: This proposal addresses conflicts with the vapor retarder and wind resistance provisions.

The IRC provisions for vapor retarders do not allow prescriptive compliance for walls with "double" Class I vapor retarders.

The alteration does not need to comply with new vapor retarder requirements if vapor permeability characteristics did not change.

Section R702.7 does not contain insulation requirements.

The intent of this section is not to require replacement of the existing structural exterior sheathing when replacing the cladding.

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

This change may or may not impact the cost of alterations.