International Energy Conservation Code

Economics, Modeling, and Whole-Building Metrics Subcommittee

Meeting Agenda

February 23, 2022
11:00 AM EST to 1:00 PM EST (2 hours)
Webex Link

Committee Chair: Ian Finlayson
Committee Vice Chair: Brian Shanks

1. Call to order.

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

3. Roll Call. Vice Chair

4. Review of Agenda. Chair

5. Approval of Meeting Minutes – January 26th meeting

6. Action Items.

   A 1. Update on cost-effectiveness screening tools by PNNL and CA representatives; Jamie Howland and Rob Salcido and new ICC memorandum on discount rates link

   A 2. Vote on recommending cost-effectiveness tool for full Residential Committee consideration.

   B 1. Hearing and vote on batch #3 of code proposals assigned to this sub-committee from code proposal proponents as follows:

Panel 1: Allow inclusion of renewables in R405			
REPI-116-21 (Mod2)	V. Rob Salcido	R405	~~2015 IECC~~ ~~Env Backstop~~ & renewables
Panel 2: Remove the 5 percent cap on renewables (Note: REPI -23 & -126 have the same strike-out; REPI-130 propos			
REPI-133 (Part I)	Craig Conner	R406	Remove 5% cap for on-site renewable
REPI-133 (Part II, IRC)	Craig Conner	N1106	Remove 5% cap for on-site renewable
REPI-134-21	Joe Cain	R406	Remove 5% cap for on-site renewable (same as above)
Panel 3: HVAC efficiency in the R405 Standard Reference Design			
REPI-122-21 (Mod2)	Vladimir Kochkin	R405	~~Env Backstop~~ ~~&~~ Table 405.4.2 Equipment in Reference Design
REPI-123-21	Amanda Hickman	R405	Table 405.4.2 Equipment in Reference Design
Panel 4: Remove the "5 percent less" Additional Efficiency reqt for R406 path (Note: REPI -23 has the same strikeout			
REPI-21-21	Vladimir Kochkin	R401	Remove additional efficiency reqt for ERI
REPI-22-21	Amanda Hickman	R401 R406	Remove additional efficiency reqt for ERI Remove the Env Backstop (same as REPI-126)
Panel 5: Ventilation Rate in R406 (Discuss all 4 proposals prior to voting)			
REPI-131-21	Vladimir Kochkin	R406	edit vent rate
REPI-132-21	Mike Moore	R406	edit vent rate (same as REPI-23 & 126)
REPI-23-21	Ryan Meres	R406	Remove additional efficiency reqt for ERI (same as REPI-21), ed Backstop & edit vent rate (same as REPI-132)
REPI-124-21	Mike Moore	R405	Assigned to HVAC, but based on discussion here, provide recor

7. Discussion/proposal for upcoming March 9th meeting Agenda and ordering of proposals

8. Other business.

9. Adjourn.

FOR FURTHER INFORMATION BE SURE TO VISIT THE ICC WEBSITE:
ICC Energy webpage
Code Change Monograph

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

Ian Finlayson
Subcommittee Chair
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REPI-116-21

Residential Renewable Tradeoffs for Performance Path (127)

IECC®: R405.1, TABLE R405.4.2(1)

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

2021 International Energy Conservation Code

Revise as follows:

R405.1 (N1105.1) Scope. This section establishes criteria for compliance using total building performance analysis. Such analysis shall include heating, cooling, mechanical ventilation, ~~and~~ service water-heating, and on-site renewable energy only.

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

Portions of table not shown remain unchanged.

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN	
On-site renewable energy	**As-Proposed**	**As-Proposed**	

Reason: This proposal seeks to clarify how renewable energy should be handled as part of Section 405 performance calculations. Onsite renewable energy sources, particularly PV and energy storage systems, play a critical role in decarbonizing the building sector. However, these technologies are not clearly recognized within the scope of Section 405 and in performing whole-building energy calculations for the purposes of demonstrating code compliance. This has sometimes led to confusion in application, as Section 405 is portrayed as representing "total building performance" yet is silent on this significant aspect of whole-building energy consumption, particularly as more people are looking to the performance path in pursuit of advanced energy and climate goals. In addressing the important role of onsite renewable energy sources in reducing net onsite energy consumption, and clarifying their role via Section 405, it's also critical that resulting tradeoffs between energy efficiency and renewable energy be handled appropriately. Mechanisms must exist that avoid eroding cost-effective energy efficiency measures, particularly those with a long measure-life, and which ensure a more energy efficient and lower energy building, overall. Renewables are therefore handled in a way similar to equipment tradeoffs, which ensures that energy loads which are not historically regulated by building energy codes cannot be traded against cost-effective efficiency measures. ~~The proposal also retains the existing energy efficiency "backstop" while updating that specification based on the 2015 IECC, which has been demonstrated cost effective by DOE and others and adopted as such by a number of U.S. states and local governments~~.

Cost Impact: The code change proposal will neither increase nor decrease the cost of construction.
The proposed change does not increase or decrease the required stringency of the Standard Reference Design, and therefore there is no direct cost impact. Section R405 is an optional compliance path that allows trade-offs of prescriptive requirements at the discretion of the designer. This proposal is intended to provide clearer guidance on how renewables should be handled in whole-building performance calculations, but does not affect the stringency of the mandatory or prescriptive requirements.

REPI-21-21

IECC®: R401.2.5

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

2021 International Energy Conservation Code

Revise as follows:

R401.2.5 (N1101.13.5) 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 under 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. ~~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.

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION[a]	TITLE
General	
~~R401.2.5~~	~~Additional efficiency packages~~
R401.3	Certificate
Building Thermal Envelope	

Reason Statement:

This proposal removes the unjustified penalty on the ERI compliance path. The 2018 ERI threshold values in Table R406.5 were developed based on energy modeling that included above-federal minimum equipment efficiencies. Therefore, the ERI path complies with the additional requirements of Sections R401.2.5 and R408 by default via meeting the minimum thresholds. The 2021 IECC further reduced the ERI targets through a separate proposal. Approval of both proposals was due to lack of coordination during the 2021 IECC development process. This change will not impact the DOE determination because DOE analysis does not include the ERI compliance path.

The 5% penalty in combination with the 2021 IECC revised ERI thresholds results in ERI values close to the zero-energy ready levels listed in Appendix RC ZERO ENERGY RESIDENTIAL BUILDING PROVISIONS in the IECC. This level of performance has not been justified for minimum code provisions. According to RESNET, less than 7% of all rated dwelling units reached an ERI/HERS below 50 and only 1% of rated dwelling received an ERI/HERS below 45 in year 2020. Less than 25 percent of dwelling units constructed in the US obtain an ERI/HERS rating.

Cost Impact:

The code change proposal will decrease the cost of construction.

This proposal removes an unjustified penalty on the ERI path.

REPI-122-21

IECC®: TABLE R405.4.2(1)

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

2021 International Energy Conservation Code

Revise as follows:

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="7">Heating Systems [d, e, i]</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>Furnaces: Complying with 10 CFR §430.32 (2021) except where a condensing furnace is used in the proposed design the minimum efficiency shall be 90% AFUE</td><td>As proposed</td></tr>
<tr><td>Boilers: Complying with 10 CFR §430.32 (2021) except where a condensing boiler is used in the proposed design the minimum efficiency shall be 88% AFUE</td><td>As proposed</td></tr>
<tr><td rowspan="3">Cooling Systems [d, f]</td><td>~~As proposed.~~
~~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>Efficiencies: Complying with 10 CFR §430.32 (2021)</td><td>As proposed</td></tr>
<tr><td rowspan="5">Service water Heating [d, g]</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>
</table>

	Tank Temperature: 120° F (48.9° C)	Same as standard reference design

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 (2021)

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

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.