

memo

Company name

To: Maureen Guttman, Chair, Pennsylvania Uniform Construction Code Review and advisory Council
From: Matthew Wojaczyk, Subcommittee Chair, International Energy Conservation Code- Residential
Date: 4/9/18
Re: Subcommittee Recommendations

Madam Chair,

The following is the Subcommittee's recommendations regarding public comments pertaining to adoption of the 2015 IECC-R provision. There were 33 public comments recommending either modification to specific provisions of the 2015 IECC-R, rejection of provisions, or wholesale rejection of the 2015 IECC-R provisions. The comments were label 1-33 and voted upon by e-mail or a phone vote.

Comment# 1-11:

As a whole, comments 1-11 recommends rejection in its entirety the provisions of the 2015 IRC chapter 11, as well as the corresponding sections of the 2015 IECC-RE.

Reason:

Implementation would increase the cost of construction, and therefore, passed on to the consumer. Additionally, technical infeasibility conditions may arise also increasing the cost of construction.

Recommendation:

Rejection of comments 5-2

Majority Opinion:

Wholesale rejection of the 2015 residential energy provisions should not be considered. These sections are interrelated and should be considered non-severable. Additionally, the majority opines the commentator lacks specificity in his opinion. Majority recognizes the need for Pennsylvania to modernize energy provision code for increased efficiency of homes into the future.

Minority Opinion:

Agrees with commenter that the new provisions will increase the cost of construction increase, which in turn will be pass onto the consumer. Additionally, a belief that energy provisions should not be a part of residential construction.

Comment # 12:

Commenter recommends modification to subsection R102.1.1 **Above Code Programs** of 2015 IECC to delete last sentence in section.

N1101.4 (R102.1.1) Above code programs. The *building official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy-efficiency program to exceed the energy efficiency required by this code. Buildings *approved* in writing by such an energy-efficiency program shall be considered in compliance with this code. ~~The requirements identified as “mandatory” in this chapter, as applicable, shall be met.~~

Reason:

Making provisions of code mandatory, defeats the purpose of above code programs as an alternative means of compliance.

Recommendation:

4-4

Opposition Opinion:

This provision is consistent in the 2015 and 2018 code cycles, indicating the direction for which code professionals are moving in with regard to compliance. Additionally, this provision provides no clear guidance as to what would constitute an above code program. This section provides at least a minimum of prescriptive requirements to be met when attempting to use an above code program.

Proponent Opinion:

Making provisions of code mandatory, defeats the purpose of above code programs as an alternative means of compliance.

Comment #13

Commenter Recommends modification and addition to code section N1102 (R402) Building thermal Envelope, including the following subsections:

N1102.4 (402.4) Air Leakage

Strikes mandatory from section

Proposes removal of section R402.4.5 Recessed lighting.

N1102.4.1 (R402.4.1) Building Thermal Envelope

N1102.4.1.1 (R402.4.1.1) Installation

Commenter suggest modification by striking “as applicable to the method of construction. Where required by the code official, an approved third party shall inspect all components and verify compliance.” and adding the following to the end of the section “and shall be demonstrated to comply with one of the following options given by Sections N1102.4.1.2 or N1102.4.1.4.”

(New Section) N1102.4.1.3 (R402.4.1.3) Leakage Rate

Commenter proposes new section to read as follows, “N1102.4.1.3 (R402.4.1.3) Leakage Rate (Prescriptive) The building or dwelling unit shall have an air leakage rate not exceeding 6 air change per hour in climate zones 1 through 8, when tested in accordance with section N1102.4.1.2”

(New Section) N1102.4.1.4 Visual inspection option

Commenter proposes a visual inspection option to verify items listed in table N1102.4.1.1 comply, as well as giving the inspector the option to require a 3rd party to inspect for compliance.

N1103.3 (R403.6) Mechanical Ventilation

Commenter proposes striking “mandatory” and adding verbiage as follows;

“N1103.6 (R403.6) Mechanical ventilation (Mandatory).--If required by section R303.4 of this code...”

Table N1105.5.5.2 (1) (R405.5.2(1))

Commenter proposes change in the required air leakage rate to 6 ACH in climate zones 1-8.

Reason: The proposal provide a path for reasonable and attainable air leakage rates. Making air leakage rates prescriptive will allow flexibility by designers in in tradeoffs with other performance path measures. The increase in ACH is substantial and the ability meet such an increased requirement is difficult. Other states have opted to adjust this section.

Recommendation:

4-4

Opposition opinion:

Modification of this section is not necessary; Reintroduction of the visual option for inspection is an unreliable method for determining air leakage. The commenter’s proposal suggests a very nominal improvement in air leakage rates, additionally; a report commissioned by the DOE in Pennsylvania indicates performance of buildings to be within range of 3 ACH. Based upon this report, a 3ACH rate is within reason to achieve.

Proponent’s opinion:

Agrees with commenter

Comment # 14

Commenter recommends Modification to N1103.3 (R403.3) as follows:

“Ducts and air handlers shall be installed in accordance with Sections N1103.31 through ~~N1103.3.5~~ N1103.3.7”

This modification is meant to include new language proposed that is generally consistent with the language in the 2018 IRC chapter 11 and 2018 IECC-R provisions.

(New Section) N1103.3.6 (R403.3.6)

(New Section) N1103.6.1 (R403.3.6.1)

(New Section) N1103.3.7 (R403.3.7)

Reason: This proposed language is in the 2018 codes, the 2015 code is silent on this.

Recommendation:

5-3 Accept, with proposed modification

Majority opinion:

The language proposed by the commenter closely mirrors the language in the 2018 codes. Commenters proposed modification does not include language pertaining to complete language of 2018 code. We recommend adding the language as is written in the 2018 codes for these proposed new sections of the 2015 code.

Comment #15

Commenter proposes modification (in bold) to Section N14105 Simulated Performance Alternative (Performance),

Table N1105.5.2(1) (R405.5.2(1))

Heating systems d, e	<p>As proposed for other than electric heating without a heat pump, 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 N1103.7</p> <p>For other than electric heating without a heat pump</p> <p>Fuel Type: Same as proposed design</p> <p>Efficiencies:</p> <p>-Electric: air-source heat pump in accordance with prevailing federal minimum standards</p> <p>-Nonelectric furnaces: natural gas furnace in accordance with prevailing federal minimum standards</p> <p>-Nonelectric boilers: natural gas boiler in accordance with prevailing federal minimum standards</p>	<p>As proposed</p> <p>As proposed</p> <p>As proposes</p> <p>As proposed</p> <p>As Proposed</p>
Cooling systems d, f	<p>As proposed</p> <p>Fuel Type: Electric</p> <p>-Efficiency: in accordance with prevailing federal minimum standard</p> <p>Capacity: sized in accordance with Section N1103.7.</p>	<p>As proposed</p> <p>As proposed</p> <p>As proposed</p> <p>As proposes</p>
Service water heating d, e, f	<p>As proposed</p> <p>Use: same as proposed design</p> <p>-fuel type: Same as proposed design</p> <p>-Efficiency: in accordance with prevailing federal minimum standards</p> <p>-Use: gal/day = 30 +10 Nbr</p> <p>-Tank temperature: 120 °F</p>	<p>As proposed</p> <p>gal/day = 30 + (10 × Nbr)</p>

Reason: Allows for tradeoffs in energy efficiency. Builders can increase whole house performance with use of energy efficient equipment. Creates an incentive to install energy efficient equipment.

Recommendation:

6-2 Reject

Majority opinion:

Commenter proposes this as a way to trade off efficiency, possibly in the building envelope requirements. This argument has been continually proposed and rejected by ICC membership. Commenter fails to support recommendation in congruence with this boards mandate to evaluate health, safety, and welfare as well as financial impact and technical feasibility.

Minority opinion:

Agrees with commenter

Comment #16

Commenter proposes adding exception to N1102.4 (R402.4) as follows:

Exception: Two family dwelling units and townhouses shall be permitted to comply with IECC section C402.5

Reason: IECC-c provisions consider multi-unit building, Duplexes and townhouse pose multiple problems not associated with detached SFRD's

Recommendation:

6-2 Reject

Majority opinion:

Minority opinion:

Comment # 17

Commenter recommends modification to table N1105.5.2(1) (R405.5.2(1) and removal of footnote b

Vertical fenestration other than opaque doors	Total area b = As proposed (a) The proposed glazing area, where the proposed glazing area is less than 15 percent of the conditioned floor area (b) 15 percent of the conditioned floor area, where the proposed glazing area is 15 percent or more of the conditioned floor area	As proposed
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Reason:

Walls generally perform better than glass, yet the code contains no incentive in the performance path for a designer to optimize window area.

Recommendation:

5-2 Reject

Majority opinion:

The recommendation to remove the footnote is not necessary. The commenter calls out the wrong footnote. The appropriate footnote is h and refers appropriately to the section.

Minority opinion:

Same as commenter.

Comment #18

Commenter proposes modification to table N1106.4 (R406.4) in Climate Zones 4, 5, and 6

Climate Zone	Energy Rating Index
4	54 79
5	55 82
6	54 80

Reason: The ratings in the index are substantially higher as compared to a prescriptive path code compliance method.

Recommendation:

5-2 Reject

Majority opinion:

The report provided by the commenter supporting their position is not supported. The scores for the 2015 IECC were based on analysis performed by the Florida Solar Energy Center that modeled 16 cities across each climate zone using the 2012 IECC envelope and air leakage requirements, plus an additional 10% in savings. The concern that the prescriptive path method of compliance is substantially higher is not supported. Additionally, it is reported that buildings being built under the 2009 code are typically performing better than their required allowable use.

Minority opinion:

Supports commenter’s position

Comment #19

Commenter proposes modification to Table N1102.1.2 (R402.1.2) Wood Frame Wall R-value and Table 1102.1.4 (R402.1.4) Frame Wall U-Factor in climate zone 4. Modification would keep R-values and U-factors the same as those found in the 2009 IRC.

Reason:

Commenter states the increased R-values proposed in the 2015 code would increase the cost of construction with a pay back of over 40 years.

Recommendation:

5-2 Reject

Majority opinion:

The commentator's position relies upon energy modeling which they ran. This modeling appears to neglect other energy efficiency improvements that may defray the increased cost associated with this provision. This modeling and payback scenario is inconsistent with DOE Study.

Minority opinion:

Agrees with commenters position

Comment # 20

Commenter proposes modification to Table N1102.1.2 (R402.1.2) Ceiling R-value and Table 1102.1.4 (R402.1.4) Ceiling U-Factor in climate zone 4 and 5. Modification would keep R-values and U-factors the same as those found in the 2009 IRC.

Reason:

Commenter states the increased R-values proposed in the 2015 code would increase the cost of construction with a pay back of over 40 years.

Recommendation:

5-2 Reject

Majority opinion:

The commentator's position relies upon energy modeling which they ran. This modeling appears to neglect other energy efficiency improvements that may defray the increased cost associated with this provision. This modeling and payback scenario is inconsistent with DOE Study.

Minority opinion:

Agrees with commenters position

Comment # 21

Commenter proposes modification to Table N1102.1.2 (R402.1.2) Wood Frame Wall R-value and Table 1102.1.4 (R402.1.4) Frame Wall U-Factor in climate zone 6. Modification would keep R-values and U-factors the same as those found in the 2009 IRC.

Reason:

Commenter states the increased R-values proposed in the 2015 code would increase the cost of construction with a pay back of over 40 years.

Recommendation:

5-2 Reject

Majority opinion:

The commentator's position relies upon energy modeling which they ran. This modeling appears to neglect other energy efficiency improvements that may defray the increased cost associated with this provision. This modeling and payback scenario is inconsistent with DOE Study.

Minority opinion:

Agrees with commenters position

Comment # 22

Commenter proposes modification to Table N1102.1.2 (R402.1.2) Basement Wall R-value and Table 1102.1.4 (R402.1.4) Basement Wall U-Factor in climate zone 5 and 6. Modification would keep R-values and U-factors the same as those found in the 2009 IRC.

Reason:

Commenter states the increased R-values proposed in the 2015 code would increase the cost of construction with a pay back of over 40 years.

Recommendation:

5-2 Reject

Majority opinion:

The commentator's position relies upon energy modeling which they ran. This modeling appears to neglect other energy efficiency improvements that may defray the increased cost associated with this provision. This modeling and payback scenario is inconsistent with DOE Study.

Minority opinion:

Agrees with commenters position

Comment # 23

Commenter proposes modification to subsection N1106.1 Defined Terms as follows

"Framing Factor. The fraction of the total building component area that is structural framing."

Commenter proposes Modification of footnotes in Table N1102.1.2 (R402.1.2) by adding footnote j. as follows

"j. R-18 insulation shall be permitted in place of R-20 requirement provided the wall framing factor is 20% or less or exterior walls with 24" O.C. nominal vertical stud spacing."

Reason:

A reduced framing factor would be a result of 24" o.c. framing should be taken into consideration when looking at the performance of the assembly as a whole. This reduction in framing should be able to coincide with a reduction of R-value in the assembly due to more available cavity space being insulated and the wall assembly performing better as a whole and consistently with the prescribed methods.

Recommendation:

5-2 Reject

Majority opinion:

The commenter is able to take advantage of Table N1102.4 (R402.1.4) to achieve equivalent U-factor results.

Minority opinion:

Agrees with commenter

Comment #24

Commenter proposes modification of section N1103.3.5 (R403.3.5) as follows

N1103.3.5 (R403.3.5) Building cavities (Mandatory). Building framing cavities shall not be used as ducts or plenums.

Reason:

Not allowing the use of building cavities for return air will require hard ducting for return air in stud bays and floor spaces in addition to complicating wiring and plumbing installations; this may require additional

labor and materials in order to create unsightly bulkheads to accommodate compliance with this provision. This is an additional cost without any stated benefit.

Recommendation:

5-2 reject

Majority opinion:

The benefit in increased energy efficiency would defray the additional cost, additionally; indoor air quality is expected to be improved.

Minority opinion:

Agrees with commenter.

Comment #25

Commenter suggest modification to section N1102.4.1.2 (R402.4.1.2) of blower door testing to 4-5 ACH per hour.

Reason:

Adoption of this section would create a jump in required rates, which would be difficult to attain.

Recommendation:

Majority opinion:

Based upon a report commissioned by the DOE in Pennsylvania , which indicates performance of buildings to be within range of 3 ACH. Based upon this report, a 3ACH rate is within reason to achieve.

Minority opinion:

Agrees with commenter

Comments #26, 29, 31, &33

Commenter proposes rejection of section N1106 (R406) regarding energy tradeoffs of the building envelope for efficiency in equipment installed.

Reason:

The life expectancy of the installed equipment is not the same as the whole building and will eventually be replaced. There is no guarantee that it will be exchanged for equivalent or better performing equipment.

Recommendation:

6-1

Accept Comment #26

5-2

Accept comment #29

5-2

Accept Comment #31

5-1

Accept comment #33

Majority opinion:

Agrees with commenter

Minority opinion:

Comment # 27

Commenter request not adopting the ACH requirements found in section N1102.4.1.2 (R402.4.1).

Reason:

Adoption of this section will create an undue hardship on homebuilders and homeowners. This will add extra cost to the price of a home and will be passed onto the homeowner.

Recommendation:

6-1 Reject

Majority opinion:

Based upon a report commissioned by the DOE in Pennsylvania which indicates performance of buildings to be within range of 3 ACH. Based upon this report, a 3ACH rate is within reason to achieve.

Minority opinion:

Agrees with commenter

Comment # 28

Commenter encourages adoption of Section N1105.2 (R405.4) with the following modification in bold be added as follows

‘with this section requires that the mandatory provisions identified in Section N1101.13 be met. All supply and return ducts not completely inside the *building thermal envelope* shall be insulated to a minimum of R-6. **Compliance with this section require that the mandatory provisions identified n section R402.4.1.2 be met.**”

Reason:

This will provide a stringent quality control for achieving energy efficiency.

Recommendation:

5-2

Accept

Majority opinion:

Agrees with commenters opinion

Minority opinion:

Comment #30

Commenter propose non adoption of entire 2015 IECC

Reason:

Adoption of provisions of the 2015 IECC would cause a large financial impact to the cost of construction and be passed onto the homeowner.

Recommendation:

6-1 Reject

Majority opinion:

Wholesale rejection of the 2015 residential energy provisions should not be considered. These sections are interrelated and should be considered non-severable. Additionally, the majority opines the commentator

lacks specificity in his opinion. Majority recognizes the need for Pennsylvania to modernize energy provision code for increased efficiency of homes into the future.

Minority opinion:

Agrees with commenter

Comment #32

Commenter recommends non-adoption of N1103.5.1 (R405.5.1)

Reason:

This section only allows demand type recirculating systems, which require action by the occupant to energize the circulation pump. By requiring water flow the purpose of recirculating systems is defeated. Time and water are traded for energy. Additionally, super insulated ultra-low flow systems are not allowed. These systems can result in equal or superior savings; dependent on occupant life style.

Recommendation:

6-0 Reject

Majority opinion:

Respectfully submitted,

Matthew Wojaczyk

Committee Members:

Daniel Corbet, Edward Fegley, Maureen Guttman, Bobby Henon, Marty Marra, Joseph Lavallo, Larry Mellot, David Nice, Matthew Wojaczyk