

# RE182-19

IECC: R406.2 (IRC N1106.2) , TABLE R406.4 (IRC N1106.4)

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## 2018 International Energy Conservation Code

Revise as follows:

**R406.2 (IRC N1106.2) Mandatory requirements.** Compliance with this section requires that the provisions identified in Sections R401 through R404 indicated as “Mandatory” and Section R403.5.3 be met. The *building thermal envelope* shall be greater than or equal to levels of efficiency and *Solar Heat Gain Coefficients* in Table 402.1.1 or 402.1.3 of the 2009 International Energy Conservation Code. Where on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2018 *International Energy Conservation Code*.

**Exception:** Supply and return ducts not completely inside the *building thermal envelope* shall be insulated to an *R*-value of not less than R-6.

**TABLE R406.4 (IRC N1106.4)  
MAXIMUM ENERGY RATING INDEX**

CLIMATE ZONE	ENERGY RATING INDEX *
1	57
2	57
3	57
4	62
5	61
6	61
7	58
8	58

~~a. Where on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the building shall meet the mandatory requirements of Section 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 Table R402.1.4 of the 2015 International Energy Conservation Code.~~

**Reason:** The purpose of this code change proposal is to make two important updates to the Energy Rating Index.

First, this proposal makes an editorial improvement by moving footnote “a” of Table R406.4 into Section R406.2, which contains the other mandatory requirements for the ERI. Given that two different thermal envelope backstops apply to the ERI depending on whether on-site renewable energy is included in the calculation, it makes sense to put these two backstops side-by-side in the same section of the code to reduce or eliminate any confusion.

Second, this proposal will update the enhanced thermal envelope backstop for homes with on-site renewable energy from the 2015 to the 2018 IECC, maintaining the same approach as set in the 2018 IECC – specifically, using the prescriptive path from the previous code as a backstop in this situation. This backstop is crucial to use of the ERI with on-site renewable energy. We continue to be concerned about the potential magnitude of trade-off credit that may apply if on-site generation is included in the ERI calculation. Analyses have shown that homes can achieve a 20-40 HERS points reduction with average-sized solar PV systems, which would allow enormous trade-offs of the home’s permanent envelope efficiency. See, e.g., RESNET, *The Impact of Photovoltaic Arrays on the HERS Index* (2015); and [https://www.energycodes.gov/sites/default/files/documents/ECodes2016\\_06\\_Haack.pdf](https://www.energycodes.gov/sites/default/files/documents/ECodes2016_06_Haack.pdf). Without reasonable limits on these solar trade-offs, homes with on-site generation could be built with far less efficiency, including substandard thermal envelopes, creating long-term problems for homeowners and reversing many of the benefits created by the IECC over the past 10 years.

**Bibliography:** RESNET, *The Impact of Photovoltaic Arrays on the HERS Index* (2015); and [https://www.energycodes.gov/sites/default/files/documents/ECodes2016\\_06\\_Haack.pdf](https://www.energycodes.gov/sites/default/files/documents/ECodes2016_06_Haack.pdf).

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction

The editorial change to move the footnote into Section R406.2 will have no cost impact, and because the 2018 IECC incorporated only very moderate increases in efficiency over the 2015 IECC (primarily window improvements with no real upgrade cost), we expect no real cost impact. Moreover, this enhanced backstop only applies to homes built to the ERI that incorporate on-site power production into the ERI calculation, which is currently a very small percentage of all code-compliant homes. Code users can also avoid any cost increase by using other compliance

alternatives.

Proposal # 4009

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