Residential Renewable Tradeoffs for Performance Path (127)

IECC®: R405.1, R405.2, TABLE R405.4.2(1)

Proponents:

2021 International Energy Conservation Code

Revise as follows:

R405.1 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.

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 building thermal envelope efficiency requirements shall be greater than or equal to levels of efficiency and solar heat gain coefficients in Table R402.1.1 or R402.1.3 of the 2015~~2009~~ *International Energy Conservation Code*.**
3. **An annual energy cost that is less than or equal to 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.**

   Exception: 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 multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

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.