

Residential Renewable Tradeoffs for Performance Path

Modify the 2021 International Energy Conservation Code as follows:

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 comply with one of the following: ~~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 2009 International Energy Conservation Code.~~
 - a. Where on-site renewable energy is included for compliance using the Total Building Performance of R402.1.1 or Table R402.1.3 of the 2015 International Energy Conservation Code.
 - b. Where on-site renewable energy is NOT included for compliance using Total Building Performance of R402.1.3 of the 2012 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	None	As-Proposed

Reason:

The Total Building Performance compliance path only considers heating, cooling, ventilation and service water heating energy only. Renewable energy is not considered toward compliance. Currently in the 2021 IECC, there is no possible way for an architect or builder to prove that a home is net zero energy other than using the ERI compliance path. By allowing on-site renewable energy to be considered, a building can show net zero energy with adequate onsite power generation. There may be concern that by allowing renewable energy as part of the total building performance compliance path there may be a reduction in the efficiency of the building envelope. As part of this change, if a proposed design includes on-site renewable energy, all components will need to minimally comply with the envelope requirements of 2015 International Energy Conservation Code. The proposed change does not increase or decrease the required stringency of the Standard Reference Design therefore there is no direct cost impact. Since section R405 is an optional compliance path that allows trade-offs of prescriptive requirements any changes in construction cost due to these trade-offs are at the discretion of the builder. For those not considering on-site renewable energy, this may provide incentive to include such technologies and enable expanded utilization of performance-based codes as renewable energy technologies experienced increased market share.

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 therefore there is no direct cost impact. Since section R405 is an optional compliance path that allows trade-offs of prescriptive requirements any changes in construction cost due to these trade-offs are at the discretion of the builder.