Minimum Renewable Capacity

IECC: (New), C401.2.2 (New), C406.5

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2018 International Energy Conservation Code

Add new text as follows:

Renewable Energy Certificate (REC). An instrument that represents the environmental attributes of one megawatt-hour of renewable electricity; also known as an energy attribute certificate (EAC).

C401.2.2 Application to On-Site Renewable Energy The *building site* shall have equipment for *on-site renewable energy* with a rated capacity of not less than 0.25 W/ft² (2.7W/m²) multiplied by the sum of the gross *conditioned floor area* for all floors up to the three (3) largest floors. Documentation shall be provided to the *code official* that indicates that *renewable energy certificates* (RECs) associated with the *on-site renewable energy* will be retained and retired by or on behalf of the *owner* or tenant.

Exceptions:

1. Any *building* located where an unshaded flat plate collector oriented towards the equator and tilted at an angle from horizontal equal to the latitude receives an annual daily average incident solar radiation less than 3.5 kWh/m²·day (1.1 kBtu/ft²·day).

2. Any *building* where more than 80% of the *roof* area is covered by any combination of equipment other than for *on-site renewable energy systems*, planters, vegetated space, *skylights* or occupied *roof* deck.

3. Any *building* where more than 50% of *roof* area is shaded from direct-beam sunlight by natural objects or by structures that are not part of the *building* for more than 2,500 annual hours between 8:00 AM and 4:00 PM.

Revise as follows:

C406.5 On-site renewable energy. The total minimum ratings of *on-site renewable energy* systems, not including *on-site renewable energy* system capacity used for compliance with Section C401.2.2, shall be one of the following:

1. Not less than 1.71 Btu/h per square foot (5.4 W/m^2) or 0.50 watts per square foot (5.4 W/m^2) of conditioned floor area.
2. Not less than 3 percent of the energy used within the building for building mechanical and service water heating equipment and lighting regulated in Chapter 4.

Reason Statement: Onsite renewable energy installations are becoming widespread in many parts of the country, and mandatory in other parts. This proposal creates a mandatory requirement for a system that is approximately one-half of the capacity that has been a compliance package selection in Section 406 since the 2012 IECC.
This language is largely based on Addendum “by” now pending to modify ASHRAE 90.1-2016. The three exceptions are written to ensure that the requirement is not being applied to buildings without adequate space on the roof, to buildings that are in areas of the country where unblocked insolation levels do not provide enough energy to make the equipment cost-effective (according to ASHRAE cost-effective criteria), and to buildings where solar access is wholly or partially blocked. The economic analysis supporting the Addendum is what was used to derive the specifications in the measure’s exceptions. The analysis included multi-variate calculations on the PNNL 3-Story Medium Office Bldg Prototype and modeled @ 0.25W/SF of renewable capacity for conditioned area on all 3 floors. The solar equipment on the prototype models passed the ASHRAE Economic Scalar in 5 of 6 insolation zones. The sixth zone aligns with the third exception in the proposal .

Section 406.5 is modified so that the renewable capacity used for compliance with the new minimum requirement is not also counted towards compliance with Section 406.

The proposal also ensures that renewable energy used for compliance with another obligation (eg. through the transfer of RECs then applied to a state Renewable Portfolio Standard) is not double counted towards compliance with the IECC. While this proposal does not cite Green-E, the Green-E Standard describes how double counting occurs when RECs associated with an on-site system have been transferred to another party in the transaction for the onsite renewable system (such as a lease or financing contract) and are then counted towards code compliance:

Examples of prohibited double uses include, but are not limited to:

1) When the same REC is sold by one party to more than one party, or any case where another party has a conflicting contract for the RECs or the renewable electricity;

2) When the same REC is claimed by more than one party, including any expressed or implied environmental claims made pursuant to electricity coming from a renewable energy resource, environmental labeling or disclosure requirements. This includes representing the energy from which RECs are derived as renewable in calculating another entity's product or portfolio resource mix for the purposes of marketing or disclosure;

3) When the same REC is used by an electricity provider or utility to meet an environmental mandate, such as an RPS, and is also used to satisfy customer sales under Green-e Energy; or

4) Use of one or more attributes of the renewable energy or REC by another party. This includes when a REC is simultaneously sold to represent "renewable electricity" to one party, and one or more Attributes associated with the same MWh of generation (such as CO2 reduction) are also sold, to another party.

Bibliography: Addendum *by* to Standard 90.1-2016, Energy Standard for Buildings Except Low-Rise Residential Buildings; ASHRAE, January 2018. (pending at the time of submittal)
Green-e Renewable Energy Standard for Canada and the United States, Version 3.2; March 20, 2018.

Cost Impact: The code change proposal will increase the cost of construction
The representative average price for onsite renewable energy systems as analyzed in 2018 by the ASHRAE 90.1 working group was $2.50 per installed watt of capacity, before incentives. The workgroup also indicated that the required capacity levels were cost-effective, according to ASHRAE criteria, for buildings in the areas that were subject to the requirement (i.e. not excepted from the requirement).