

2021 IECC

Zero Energy Appendix for the 2021 IECC

The Zero Energy Home Appendix is a convenient way for states and cities to adopt a net zero code now. The appendix is an optional add-on to the 2021 IECC that—if adopted—will result in residential buildings having net zero energy consumption over the course of a year. That is, a home will produce as much energy as it consumes, achieving zero energy usage. Adopting the appendix supports policy goals related to improving energy efficiency, renewable energy use and our climate.

Why is this needed?

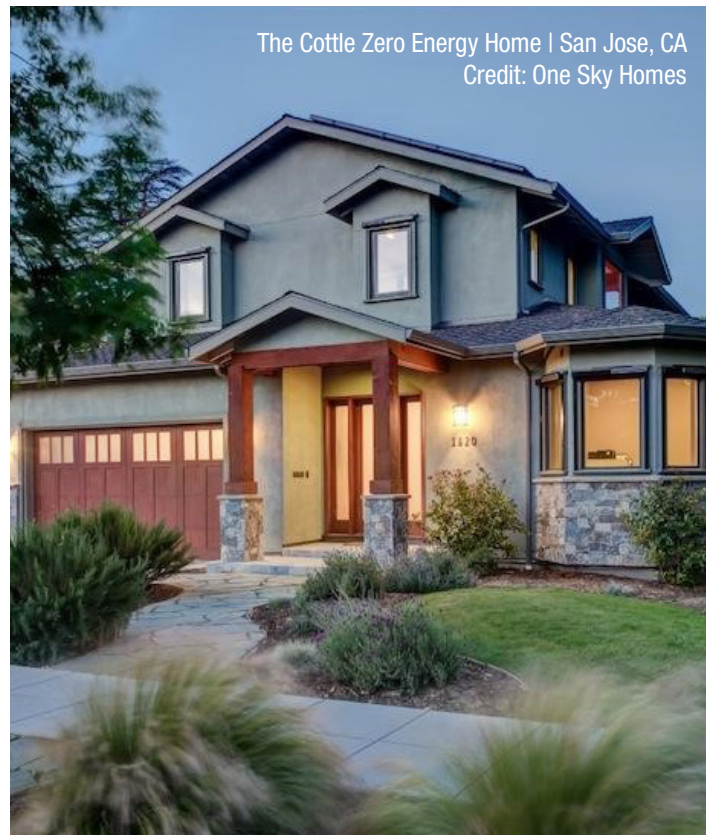
States and cities across the country are pursuing policies to reduce the energy consumption of buildings. About 300 cities and counties and 10 states are signatories to the “We Are Still In” commitment supporting climate action to meet the goals of the Paris climate accord, and over 150 cities have committed to using 100% renewable energy; more are joining all the time. The building energy code is an important policy tool for jurisdictions as they pursue these types of goals.

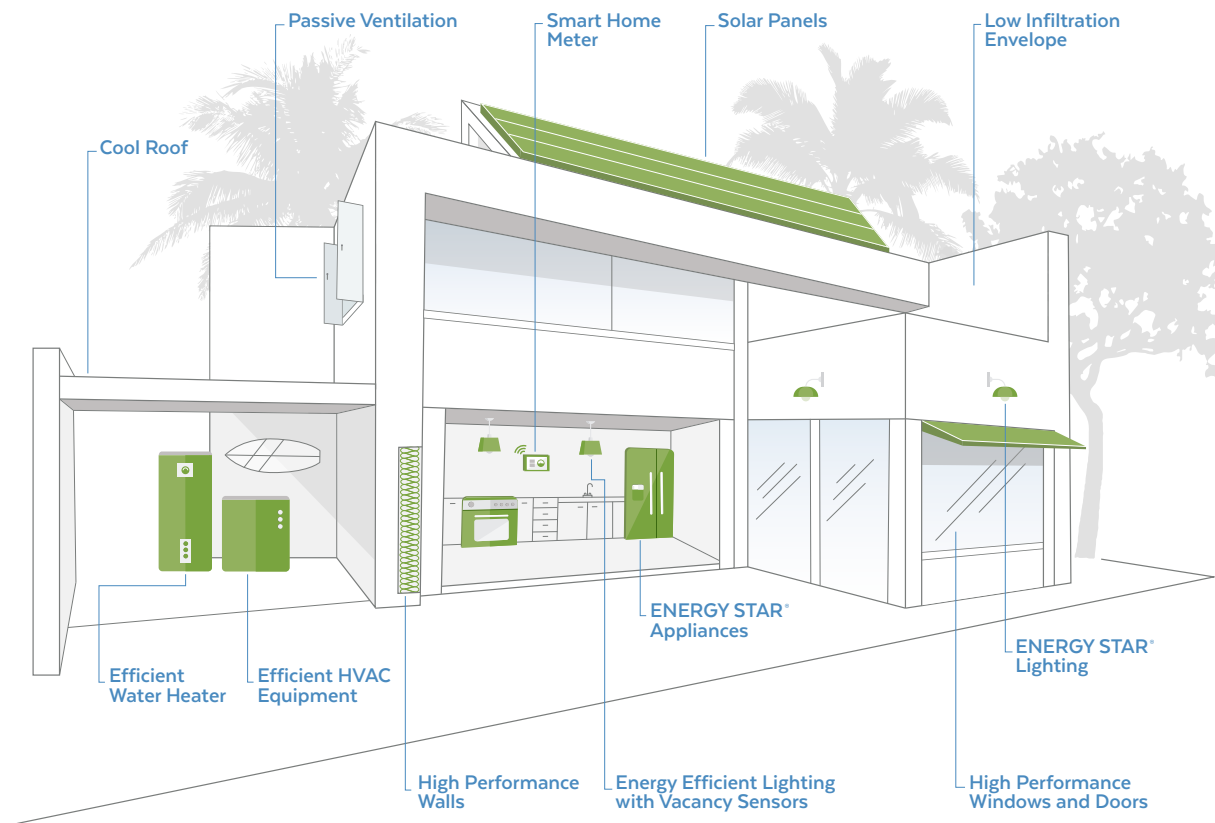
Many of these energy and climate-related goals have a target year of 2030, so the time is ripe to provide this option in the model energy code. While jurisdictions already can modify the model code to meet their needs, many do not have the in-house expertise to develop and vet this type of code language.

Integrating a zero energy building appendix into the 2021 IECC as a jurisdictional requirement or option will make the model energy code a more robust policy tool.

Adopting the zero energy building appendix in the model energy code can smooth the transition to zero energy for builders. Rather than jurisdictions developing their own net zero code language—leading to a patchwork of zero energy residential code approaches—adopting this appendix will provide consistent national language across the residential industry for manufacturers, builders and trades.

Builders can standardize their construction practices across jurisdictions and states to meet these requirements. This makes education, incentive programs, and implementation significantly more straightforward and cost-effective.





Graphic is for illustrative purposes only. The appendix is structured to give builders significant flexibility.

How the Zero Energy Home Appendix works

While there are a number of definitions of “zero energy buildings” (also referred to as “zero net energy,” “net zero energy,” or simply, “net zero”), the Appendix is based on the Energy Rating Index (ERI) compliance path found in section R406 of the 2021 IECC. In principle, the appendix works as follows:

1. A home must achieve a specified ERI value, which ensures a high level of energy-efficiency performance.*
2. The remaining energy use, on an annual level, is met with onsite or offsite power generation.

(*Note: homes must also meet the minimum envelope requirements from the 2015 IECC and the mandatory requirements in section R406.)

The ERI scores range from 43 to 47 based on the climate zone. These numbers were derived from an analysis of Home Energy Rating System (HERS) scores nation-wide, a survey of HERS scores for model high-performance homes, modeling done for ASHRAE 90.2, and the U.S. DOE Zero Energy Ready Home program.

The HERS scale ranges from 0-100, whereby a score of “0” represents a net zero home, and a score of 100 roughly equates to a home built to 2006 energy code standards (the lower the score, the better the efficiency).

Software required in the RESNET 301 standard can easily generate an ERI score for each home before and after the inclusion of renewable energy (called “Onsite Power Production” in the HERS).

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