

On-Site Power Production Is Not Included in the 2015 *IECC* Energy Rating Index and Should Not Be Used to Replace Energy Conservation/Efficiency Measures in Homes

The purpose of the 2015 International Energy Conservation Code (*IECC*) is to “regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building.” Because the 2015 *IECC* contains a new compliance option based on a whole-home energy efficiency rating (the Energy Rating Index or ERI), questions have arisen as to whether on-site power production can or should be included as part of the ERI calculation as a substitute for energy conservation to meet the ERI target score. The answer is no. On-site power production is not defined, described or prescribed in any way in the residential provisions of the 2015 *IECC*.

The ERI, as published in the 2015 *IECC*, does not permit on-site power production systems, such as solar photovoltaics, to offset energy use and replace conservation in the ERI calculation.

The ERI provisions of the 2015 *IECC* establish an index for rating the energy use in a home against a benchmark. In order to comply with the *IECC* under the ERI path, the proposed home must have an ERI value equal to or less than the target established by the code. The home must also employ certain mandatory measures and meet minimum building envelope backstop requirements.

The plain language of the *IECC* does not permit the inclusion of electricity production in ERI calculations. The scope and focus of the *IECC* and the language establishing the ERI are on the *use and conservation* of energy, not the *production* of energy. The methodology prescribed by the ERI provisions does not mention the use of renewable or other on-site energy production. Nor was including generation in the ERI discussed by supporters of the code proposal in their supporting statements or analysis.

While the ERI compliance path has similarities to RESNET’s Home Energy Rating System (HERS), the *IECC* did not adopt HERS and the two are distinctly different and serve different purposes. The ERI number is intended to measure energy conservation to meet a target, not energy purchased by the homeowner after conservation and self-generation are considered. Although the HERS rating method offers the capability to include on-site power production (renewable or not) in the calculation of the final HERS score, this does not mean that this practice applies to the ERI. If HERS software is used to produce an ERI score, the code user must simply omit the final step that would include on-site power.

In some states, amendments have been offered or made to the ERI compliance path to specifically allow builders to include some solar PV in the ERI and to cap the amount of ERI points that can be attributed to such generation. These actions recognize that without a specific amendment, trade-offs between power production and energy efficiency is simply not allowed in the ERI.

To include on-site power production in the ERI, particularly without any limitation, would create a huge efficiency loophole, and would undermine the purpose of the *IECC*.

A 5 kW solar PV system (a common size for residential homes) could improve a HERS index score by a significant amount – anywhere from 12 points to 79 points, depending on climate zone, heating system type, and design choices. If a code allowed direct trade-offs between a PV system and the efficiency of the thermal envelope, it would virtually eliminate the need to incorporate efficiency measures into the home to meet the code, wiping out many years of progress in improving the energy efficiency of homes. This is fundamentally inconsistent with the scope and intent of the *IECC*, and it should not be permitted. Moreover, allowing electric generation to replace critical energy efficiency measures, such as a good thermal envelope, will result in higher peak demands, less occupant comfort

and substantial additional energy use given the much longer typical life of envelope measures. And given the uncertain future of net-metering or incentive programs, or the possibility that panels could be removed, a homeowner could be stuck with huge energy bills and higher costs over the long run.

Allowing on-site power production in the ERI calculation would raise many unanswered questions and produce negative unintended consequences.

Treating solar PV as a direct offset for energy conservation measures in the ERI would raise several difficult questions and problems for the building code official. For example, how do code officials:

- Ensure that the power is generated on-site and the system is permanently attached to and integrated into the building?
- Ensure that the system is owned (not leased) by the homeowner and not subject to removal in the event of a home sale, default, or other circumstances?
- Determine how much energy will be produced by the system (including factoring in reduction in electric generating capability over time)?
- Ensure that power generated beyond the hourly and daily use of the building (and sent back to the grid) is not counted?
- Ensure that the power system will be adequately maintained to deliver energy over the life of the building?

The answers to these and other questions could profoundly affect the long-term efficiency of the home, not to mention the potential negative impacts on communities and utilities. Yet none of these questions is answered in the *IECC*, nor were they discussed in the process that established the ERI in the *IECC*. The ERI compliance path, as presently set out in the 2015 *IECC*, simply does not and should not allow solar PV or other on-site generation to offset energy conservation measures.

Supporters:

- Alliance to Save Energy (Alliance)
- American Council for an Energy Efficient Economy (ACEEE)
- Building Codes Assistance Project (BCAP)
- Center for the Polyurethanes Industry (CPI)
- Energy Efficient Codes Coalition (EECC)
- Extruded Polystyrene Foam Association (XPSA)
- North American Insulation Manufacturers Association (NAIMA)
- Insulation Contractors Association of America (ICAA)
- Polyisocyanurate Insulation Manufacturers Association (PIMA)
- Responsible Energy Codes Alliance (RECA)
- Spray Foam Coalition (SFC)

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