

Comments on new Energy Star Home Specifications
Building Energy Codes Program
Pacific Northwest National Laboratory
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The Building Energy Codes Program (BECP) at PNNL works to advance the efficiency of residential buildings. As part of these efforts we develop tools and materials that facilitate coordination between the codes and beyond-code programs such as Energy Star, and that educate builders and code officials via DOE's energy-code information delivery infrastructure. We appreciate the opportunity to provide feedback in that context on EPA's new Energy Star Home specifications.

We have concerns about whether the specifications are sufficiently stringent in general. We are recommending consideration of a change to EPA's latest Energy Star Home specifications. We recommend tightening the lighting and appliance specifications to reduce the reference-case refrigerator consumption to a level at least as low as the minimum allowed by Federal law and to minimize the trading of permanent efficiency features of the home for temporary features.

The lighting and appliance requirements have the potential to be valuable new elements in the Energy Star Home Specifications. However, these new requirements need careful consideration as they may not be sufficiently stringent. For example, the reference case refrigerator energy use of 775 kWh is too high. A commonly-used 21 sq. ft. top-mounted freezer with through the door ice service and a Federal (NAECA) minimum efficiency level uses 624 kWh, which is 20% better than the reference case. As the 83 HERS score is by definition 15% better than the reference home, a refrigerator with the minimum efficiency allowed by law assists in exceeding Energy Star Home specifications. At an absolute minimum, the reference case refrigerator energy use should be lowered from 775 kWh to the 669 kWh/year used in the Building America Benchmarks (see Table 10, page 23 of <http://www.nrel.gov/docs/fy05osti/36429.pdf>)

For lighting, it appears that about 25% of the lighting fixtures have to be "qualifying" to contribute the lighting component share towards meeting the 83 score. More than that will allow trade-offs reductions of envelope and other measures. Unfortunately, the qualifying fixtures don't even have to be permanent Energy Star fixtures but rather can be any kind of fluorescent or screw-in CFL. Common practice use of fluorescent lights in spaces like kitchens may contribute much of this 25%. On top of this, the use of up to five screw-in CFLs is credited. While the use of CFLs are highly commendable, these should not be allowed to trade off much more permanent measures such as insulation and windows. CFLs will eventually fail and worse yet can easily be removed at any time, including right after the HERS rater completes the inspection and leaves the house.

Minor editorial comments

Builder Option Package envelope requirements note 7: The HERS reference home does not specify insulation levels (i.e., R-values), but rather component U-factors. To greatly improve simplicity, the option of meeting the insulation requirements from Table 402.1 of the 2006 (or 2004) IECC should be allowed as an alternative to meeting component U-factor requirements.

Some of the requirements are not stated as "meet or exceed," but rather just as "meet." These should be clarified to indicate that exceeding requirements is fine. Examples include the envelope and water heater requirements in the BOPs.

For the ductwork specifications in the BOPs, delete the reference to footnote 7 because the duct insulation is already specified in the main table.

Note 3 in the performance specifications should be updated to match final thermal bypass checklist items.

Conclusion

We look forward to working with DOE and EPA to answer any technical questions on the approach presented here.