August 19, 2005

Jonathan Passe
ENERGY STAR Homes Program
US Environmental Protection Agency
1200 Pennsylvania Ave. NW
6202J
Washington, DC 20460

Dear Mr. Passe:

The CEE Home Performance Committee (Committee) thanks the Environmental Protection Agency (EPA) for the opportunity to comment on the proposed 2006 ENERGY STAR homes specification. The Committee, represented by the list of Supporting Organizations below, applauds EPA's efforts to increase the efficiency of homes, and respectfully offers several comments that the Committee believes would improve the specification.

A. Overarching Comments

Implementation Date
The Committee believes the proposal to require the new ENERGY STAR requirements of all homes completed on or after July 1, 2006 does not allow sufficient transition time for programs and builders. However, given that the 13 SEER air conditioning standards go into effect January 2006, any delay in implementing the new ENERGY STAR requirements may lead to free-ridership (i.e., builders may still receive significant credit toward ENERGY STAR Homes qualification through installing a minimally-efficient air conditioner or heat pump).

To resolve this issue, the Committee recommends that EPA modify the implementation date to require all homes committed to be ENERGY STAR six months after the Specification is finalized must meet the new requirements. Thus, if the specification is finalized September 1, 2005 all homes committed to be ENERGY STAR on, or after, March 1, 2006 would need to meet the new requirements. Six months is the minimum amount of time required by program implementers to adjust to a new Specification. To minimize gaming, EPA should make explicit that 12 months after the effective date, all homes, regardless of their start date, must meet the new requirements to be labeled ENERGY STAR.

Scope of Specification: Inclusion of Manufactured Homes
The Committee believes the current ENERGY STAR specification for manufactured homes will no longer deliver significant savings once the increased standard for central air conditioners and heat pumps takes effect. The need for a stringent ENERGY STAR specification for manufactured housing is heightened due to the recently-signed federal energy bill, which offers tax credits for manufactured homes that exceed code by 30% or qualify for ENERGY STAR. In

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2006, meeting the minimum ENERGY STAR requirements will result in significantly less than 30% savings.

To remedy this, the Committee strongly recommends that EPA amend the manufactured homes specification to ensure savings of approximately 30%, or expand the scope of the site-built new homes specification to also encompass manufactured housing.

Lighting Fixture Requirement

The Committee applauds EPA's inclusion of lighting and appliance requirements within the ENERGY STAR Homes Builder Option Package specification, and as an option within the performance path specification, though some changes are recommended. The group recommends that EPA consider allowing screw-base CFLs to be used as an alternative to hardwired fixtures in meeting the lighting component of the specifications. This approach has been used successfully in many new construction programs in the absence of widespread availability of ENERGY STAR-qualified fixtures in all decorative styles and at all price points.

If EPA agrees to incorporate screw-base CFLs as an option in meeting the ENERGY STAR lighting requirement, the number of ENERGY STAR light fixtures, ENERGY STAR ceiling fans, light fixtures using screw-base CFLs, and ENERGY STAR appliances required in an ENERGY STAR home could be increased to ten or 50% of the total, whichever is less (i.e. in the case of low-rise multifamily buildings, ten may be more than the total light fixtures provided). This would provide additional energy savings and, with the incorporation of screw-base CFLs, would present a lower barrier to builder participation. Either way, the "50% of the total" option should be included to prevent inequities for dwellings with few installed light fixtures.

The Committee was also pleased to see EPA's commitment to revisit the incorporation of the Advanced Lighting Package (ALP) with stakeholders in 2008. The Committee believes that adequate availability of fixtures in the most popular style and price categories is necessary before the ALP is incorporated. If the results of that research show that availability is not adequate to support ENERGY STAR New Homes program activity, the Committee recommends that EPA: 1) work with manufacturers, retailers, and builders to ensure that the market can support the requirement, and/or 2) continue to allow screw-base CFLs in the program at that time.

Windows Requirements

Some high-efficiency windows manufactured in Canada are not ENERGY STAR labeled. In Committee discussions, several Committee members stated that participating builders often wish to install these windows in their ENERGY STAR homes, as the efficiency levels are consistent with the ENERGY STAR windows specification, though they may not have the product label. In order to allow these high-efficiency Canadian windows to be used in ENERGY STAR homes, the Committee recommends that all references to ENERGY STAR Windows be changed to "ENERGY STAR Windows, or better, as demonstrated by NFRC certified ratings that meet or exceed the ENERGY STAR requirements."

Duct Sealing Requirements
The Committee has concerns about the ability of sheet metal duct systems to meet the proposed duct leakage requirements for the performance and prescriptive paths of 6 cfm and 4 cfm to outdoors/100 sq. ft. of conditioned floor area, respectively. Sheet metal duct systems have several benefits over flex ducts (e.g., better durability, lower friction, and fewer problems with air flow), and the Committee believes it would be undesirable if the ENERGY STAR duct sealing requirement had the unintended consequence of encouraging builders to install flex ducts over sheet metal ducts. EPA is encouraged to set a duct sealing requirement that would not have this market effect.

Also, the Committee believes the "9 cfm total/100 sq. ft" requirement is inconsistent, has little benefit, adds an unnecessary burden on raters, and therefore should be eliminated.

Lastly, the Committee recommends the language in Note 5 of the performance path specification regarding exceptions to the duct leakage requirement be reworded to:

> *Duct leakage testing can be waived if the ducts <u>and air handler</u> are located in conditioned space.*

Homes with Oil or Gas Hydronic Water Heating
The Committee agrees with the intent of Note 13 in the Performance Path and Note 4 in the Builder Option Package, which are intended to prevent a boiler from maintaining core temperature continuously during the summer solely to provide hot water. We recommend modifications that would enable other efficient systems to be used. As currently written, the notes would prohibit commonly installed efficient systems in its attempt to prohibit inefficient system installations. As such, the Committee recommends that the Performance Path Note 13 be amended to:

> *In homes with oil or gas hydronic equipment as the primary source of heating, tankless coils on the boiler are prohibited.*

Similarly, the Committee recommends that the Builder Option Package Note 4 be amended to:

> *In homes with oil or gas hydronic equipment, domestic water heating must be provided by an indirect-fired storage tank as a zone off the space heating boiler. Alternatively, an oil or gas water heater with an EF of 0.78 or higher may be used.*

Insulation Requirements
The Committee opposes a mandatory insulation requirement in the performance specification. For the Builder Option Package, the Committee recommends that the specification reference an appended table (such as Table 1 or Table 2 in Appendix A of these comments) that makes explicit the insulation requirements of 2006 HERS Reference Home.

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Only referring to the "HERS Reference Home" in the Builder Option Package insulation requirements is inadequate for two reasons. First, it requires raters and builders to look up values in a separate document. Second, the definition in the RESNET Standard is expressed in U-factors rather than R-values. There is some disagreement, even among experts, regarding the correct way to convert U-factors to cavity insulation R-values. It is difficult for many raters and builders to take the information in the Standard and apply it correctly to determine the required specifications for the building. An R-value table, like Table 1 or Table 2, solves this problem by clearly stating prescriptive requirements in terms builders and raters can easily understand.

Table 1 and its footnotes provide the prescriptive requirements that are equivalent to the HERS reference home. It requires insulation inspections to verify insulation performance. Table 2 is provided as an alternate option that would not require the insulation inspection.

Clarification of Footnote Headings
The Committee finds the combination of footnotes regarding "recommendations" and "requirements" under the same headings potentially confusing to builders and program implementers. Creating two new headings, "Additional Requirements" and "General Notes and Recommendations," and organizing the footnotes accordingly, would minimize confusion.

B. Comments on Performance Path Requirements

ENERGY STAR Mandatory Scoring Exception for CFLs
The Committee understands that by limiting the number of CFLs that can be used to increase the HERS Score, it is EPA's intent to safeguard against builders achieving ENERGY STAR qualification primarily by installing CFLs. In order to justify such a requirement, there should be clear evidence that A) the expected incremental credit of installing more than five CFLs is significant relative to credit received for other building improvements, B) a significant energy penalty will result if builders choose to achieve the required HERS Score by installing more than five CFLs instead of making other building improvements—i.e., the HERS rating method is biased towards CFLs—and C) builders are likely to make this decision.

The Committee is unaware of such evidence, and recommends eliminating this requirement. Even if rating software were modified to accommodate this exception, the Committee would still have concerns about the burden of duplicate record-keeping on raters.

If the aforementioned evidence does exist, this issue is best addressed by increasing the HERS Score requirements to ensure builders are unable to avoid making other important improvements by installing more than five CFLs. Setting a limit on the number of CFLs that builders receive credit for sends a mixed message regarding the benefits of efficient lighting. If EPA determines this requirement must remain in the specification, the Committee recommends that in order to ease in-field assessments it apply to both screw-based and pin-based CFLs.

Thank you again for the opportunity to provide input to the ENERGY STAR Homes specification. Any questions you may have regarding these comments can be directed to CEE Residential Program Manager John Taylor at 617-589-3949 ext. 228.

Sincerely,

Marc Hoffman
Executive Director

Supporting Organizations
Efficiency Vermont
KeySpan Energy
National Grid
Northeast Utilities
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SMUD
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APPENDIX A

Table 1—R-value requirements by Climate Zone[a,b]

Climate Zone[c]	Fenestration and Opaque Door U-Factor	Glazed Fenestration Assembly SHGC	Ceiling R-value[d,e]	Frame Wall R-value	Floor Over Unconditioned Space R-value	Basement Wall R-value[f]	Crawl Space R-value	Slab-on-Grade[g,h] R-Value & Depth
1	1.20	0.40	30	13	13	0	0	0
2	0.75	0.40	30	13	13	0	0	0
3	0.65	0.40	30	13	19	0	5/13	0
4 except Marine	0.40	0.55	38	13	19	10/13	10/13	10, 2 ft.
5 and Marine 4	0.35	0.55	38	19 or 13+5	30	10/13	10/13	10, 2 ft.
6	0.35	0.55	49	19 or 13+5	30	10/13	10/13	10, 4 ft.
7 and 8	0.35	0.55	49	21 or 13+7	30	10/13	10/13	10, 4 ft.

Notes:

(a) All insulation must be verified as "Grade I" by an insulation inspection according to RESNET standards.
(b) Alternate packages may be calculated by a UA tradeoff with a RESNET-approved tool.
(c) Climate zones shall be as specified by the 2004 Supplement Edition of the IECC.
(d) Flat ceiling insulation shall be installed such that the framing is entirely covered with insulation.
(e) Cathedral ceilings may not comprise more than 20% of the total ceiling area, unless a minimum of R-10 of the required R-value is provided by continuous rigid foam insulation.
(f) For basements where the conditioned space boundary comprises the basement walls.
(g) R-5 shall be added to the required R-value for slabs with embedded heating.
(h) Slab-on-grade insulation "depth" is considered valid in either the horizontal or the vertical direction, but must be continuous to the top of the slab.

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Table 2 – R-value requirements for insulation inspected only on building completion [a]

Climate Zone [b]	Ceiling R-value [c]	Frame Wall R-value [d]	Floor Over Unconditioned Space R-value [e]	Basement Wall R-value [f]	Crawl Space R-value [c]	Slab-on-Grade [g,h] R-Value & Depth
1	n/a	13 + 5	21	0	n/a	0
2	n/a	13 + 5	21	0	n/a	0
3	n/a	13 + 5	19 + 5	0	n/a	0
4 except Marine	n/a	13 + 5	19 + 5	13 + 5	n/a	10, 2 ft.
5 and Marine 4	n/a	19 + 5	30 + 7	13 + 5	n/a	10, 2 ft.
6	n/a	19 + 5	30 + 7	13 + 5	n/a	10, 4 ft.
7 and 8	n/a	21 + 5	30 + 7	13 + 5	n/a	10, 4 ft.

Notes:

(a) Applicable when single inspection is performed and wall insulation is not visible. Window U- and SHGC requirements are required to meet those values in Table 1.

(b) Climate zones shall be as specified by the 2004 Supplement Edition of the IECC.

(c) Uninspected alternate is not available. Attic and crawlspace insulation must be installed and inspected according to Table 1. These areas are generally accessible for inspection after drywall is installed.

(d) "13+5" means R-13 cavity insulation (or 19 or 21)plus R-5 insulated sheathing. If structural sheathing covers 25% or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

(e) "19+5" means R-19 cavity insulation plus R-5 insulating sheathing."30+7" means R-30 cavity insulation plus R-7 insulating sheathing.

(f) For basements where the conditioned space boundary comprises the basement walls. "13+5" means R-13 cavity insulation plus R-5 continuous rigid insulation.

(g) R-5 shall be added to the required R-value for slabs with embedded heating.

(h) Slab-on-grade insulation "depth" is considered valid in either the horizontal or the vertical direction, but must be inspected to be continuous to the top of the slab.

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