



November 16, 2009

Dear Partners,

During the first comment period for the proposed 2011 ENERGY STAR New Homes guidelines, EPA received over 350 pages of comments from respondents. EPA has reviewed all comments and has made numerous changes to the proposed guidelines in response. This document provides a summary of the most significant changes, but omits many smaller changes that were made, such as minor clarifications and the addition of formal definitions. For more information, please see the revised guideline documents and EPA's detailed response document, which contains all policy changes made and the accompanying rationale.

The summary of the most significant changes is organized by topic, including a section on:

- Implementation Timeline;
- Marketing, Quality Assurance, Training, & Brand Integrity;
- The ENERGY STAR Reference Design, Prescriptive Path, & Performance Path;
- The Thermal Enclosure System Rater Checklist, which now encompasses the Thermal Bypass Checklist and the originally proposed Quality Framing Checklist;
- The HVAC System Quality Installation Rater Checklist and HVAC System Quality Installation Contractor Checklist, which now encompass the originally proposed Indoor Air Quality Checklist, and;
- The Water Management System Rater Checklist and Water Management System Builder Checklist, which was previously named the Water-Managed Construction Checklist.

Implementation Timeline:

In addition to the originally proposed one year transition period from January 1, 2010 to January 1, 2011, EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. These checklist sections are similar to the requirements in the current Thermal Bypass Checklist. Effectively, this plan allows partners a full two years to educate and train partners and allow them to integrate the new mandatory checklists into their workflows prior to full implementation. Additionally, EPA will make available a new ENERGY STAR Qualified Homes label starting January 1, 2011 to provide builders an opportunity to differentiate homes that are qualified prior to January 1, 2012 that use the full requirements of the new guidelines, including all mandatory checklists.

Marketing, Quality Assurance, Training, & Brand Integrity:

In response to concerns about proper training, marketing support, and quality assurance, EPA wants to make clear that it is currently working on developing strategies to:

- Communicate with all stakeholders about the new ENERGY STAR 2011 guidelines, including the development and distribution of new marketing materials for builders, raters, and consumers;
- Provide extensive training resources to partners, including field guides, webinars, and regional training classes, and require mandatory online training for partners. EPA is also working with ACCA and other HVAC professionals regarding the development of appropriate training for raters and HVAC contractors. Lastly, EPA is engaging the appraisal industry to promote industry participation and develop clear recommendations for valuating the energy efficiency of a home.
- Enhance quality assurance through work with RESNET to integrate the mandatory checklists into their standards and revise the Quality Assurance guidelines and to implement new quality assurance requirements for sponsoring programs.

ENERGY STAR Reference Design, Prescriptive Path, & Performance Path:

EPA has maintained the overall concept of the proposed prescriptive and performance path. The prescriptive path will utilize the ENERGY STAR Reference Design, while the performance path will utilize the ENERGY STAR Reference Design and a Size Adjustment Factor to determine an ENERGY STAR HERS Index Target for each home. However, many details of the proposal have been modified to accommodate respondents' concerns.

First, EPA has modified some of the efficiency measures that were originally proposed. These include:

- Elimination of low-flow showerheads and efficient hot water distribution systems from both the performance and prescriptive path to reduce confusion with EPA's new Water Sense guidelines.
- Reduction of gas furnace efficiency in the prescriptive path and ENERGY STAR Reference Design from 92% AFUE to 90% AFUE, to align with the current ENERGY STAR qualified furnace program.
- Reduction of infiltration levels by 1 ACH50 in all climates to compensate for reduced stringency of items mentioned above and to reflect improved practices for air sealing.
- An increase in heatpump efficiency for cold climates in the prescriptive path and ENERGY STAR Reference Design to ensure meaningful savings in this subset of homes. An ENERGY STAR qualified ground-source heatpump or ENERGY STAR qualified air-source heatpump with ENERGY STAR qualified dual-fuel backup may be used in any climate. In addition, an ENERGY STAR qualified air-source heatpump that meets the following requirements may be used in Climate Zones 4 through 6, as follows:
 - CZ 4: ≥ 8.5 HSPF / 14.5 SEER / 12 EER with electric backup, OR;
 - CZ 5: ≥ 9.25 HSPF / 14.5 SEER / 12 EER with electric backup, OR;
 - CZ 6: ≥ 9.5 HSPF / 14.5 SEER / 12 EER with electric backup.
- To ensure that an effective thermal envelope is provided with every qualified home, the addition of a requirement that all homes using the performance path must meet or exceed the prescriptive requirements for window performance and insulation levels contained within the 2009 IECC.
- Modification of the definition for window area in the ENERGY STAR Reference Design to align with the 2009 IECC, which sets the window area equal to the rated home window or to 15%, whichever is less.

Second, EPA has eliminated mandatory requirements for efficient lighting; ENERGY STAR qualified dishwashers, refrigerators, and ceiling fans; and R-8 duct insulation. Instead, these items will only be maintained within the ENERGY STAR Reference Design and the prescriptive path, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings, if they so desire.

Other modifications to mandatory requirements include:

- Efficient exhaust fans will be maintained as a mandatory requirement for full-baths only.
- For the prescriptive path and ENERGY STAR Reference Design, EPA has aligned with the duct insulation requirements of the 2009 IECC, which requires R-8 for supply ducts in unconditioned attics and R-6 for all other supply ducts and all return ducts. For the performance path, EPA has set a minimum insulation level of R-6 for all ducts, allowing partners to use higher levels of insulation as they see fit.

Third, EPA has created a new document that includes an expanded definition of the ENERGY STAR Reference Design to be used when calculating the ENERGY STAR HERS index target. The document is titled "2011 ENERGY STAR HERS Index Target Procedure" and is located on EPA's Web site.

Fourth, EPA has clarified that Raters shall not alter the configuration of the ENERGY STAR Reference Design unless directed to do so by EPA. Instead, EPA will provide specific guidance when/if customized ENERGY STAR Reference Designs are created and will establish a specific timeline for incorporating the customized requirements.

Fifth, EPA has clarified that Raters shall manually configure the ENERGY STAR Reference Design only until a version of the RESNET-accredited software program used by each Rater becomes available that automatically configures the ENERGY STAR Reference Design and calculates its associated HERS index value and then applies the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Upon announcement of the release of such a version, Raters using that software program shall have 60 days to begin all new ratings with this updated version.

Thermal Enclosure System Rater Checklist:

The current Thermal Bypass Checklist and originally proposed Quality Framing Checklist have been integrated into a broader Thermal Enclosure System Rater Checklist. However, the originally proposed requirements of the two checklists have largely been maintained in the sections for Fully-Aligned Air Barriers and Reduced Thermal Bridging. In addition, new sections have been added for High Performance Windows, Quality-Installed Insulation, and Air Sealing. Many of the requirements have been clarified and flexibility for achieving compliance has been increased.

First, to ease the compliance process, EPA has increased the total allowances for builder-verified items from four to eight. The eight allowances encompass all of the requirements of the checklist, including the new section for Reduced Thermal Bridging.

Second, EPA has clarified or altered several key components of the new Advanced Framing section. These include the following:

- Raters need not direct builders to remove framing, but instead shall simply determine compliance by confirming that the specified details have been used and by assessing the amount of framing in the home that has no apparent or documented structural purpose. This includes clarification of the mandate to eliminate unnecessary studs as follows: “Vertical framing members shall either be on-center or have an alternative structural purpose that is apparent to the rater or documented by the builder, architect or engineer. No more than 5% of studs may lack an apparent or documented structural purpose, which is equivalent to one vertical stud for every 30 linear feet of wall, assuming 16” stud spacing.”
- All platforms in the attic, and not just HVAC platforms, must be raised to ensure full-depth insulation underneath.
- The explicit requirement for the use of a raised-heel truss requirement has been clarified as follows: “Raised-heel trusses or equivalent framing techniques shall elevate the roof adequately to allow for insulation at a depth of at least 75% of full insulation level used throughout the rest of the attic”.
- Framing at windows shall be limited to a maximum of one pair of king studs and one pair jack studs per window opening to support the header and window sill. Additional jack studs shall be used only as needed for structural support and cripple studs only as needed to maintain on-center spacing of studs.
- An allowance for Grade II wall cavity insulation has been added, if rigid insulation sheathing is used. In addition, steel-framed walls must use rigid insulation sheathing to comply. In both scenarios, continuous insulated sheathing must meet or exceeds the following levels: R-3 in Climate Zones 1 to 3; R-6 in Climate Zones 4 to 6; and, R-10 in Climate Zones 7 and 8.

HVAC System Quality Installation Rater and Contractor Checklists:

EPA has eliminated the originally proposed Indoor Air Quality Checklist and the proposed requirements have been relocated to the HVAC System Quality Installation Rater Checklist and HVAC System Quality Installation Contractor Checklist. This has been done in recognition of the fact that the requirements are designed to help ensure adequate ventilation in all qualified homes and therefore complement the HVAC equipment quality installation components that have been proposed. EPA has further refined these checklists to clarify requirements, better align with industry standards, and limit liability for raters.

First, EPA has clarified in the HVAC System Quality Installation Rater checklist that the Rater is only responsible for ensuring that the Contractor has completed the Contractor checklist in its entirety, not for assessing the accuracy of the load calculations or field verifications included. Instead, it is the contractor’s exclusive responsibility to ensure the system design and installation comply with the Contractor checklist specifications. EPA has revised the proposed guidelines by reducing this requirement to a single line-item in the rater checklist, which simply states, “HVAC System Contractor checklist completed in its entirety”. **Further, EPA has included a disclaimer that the intent of the checklists is to align with ASHRAE 62.2-2010 and the ANSI / ACCA 5 QI-2007 protocol, rather than serve as a guarantee of acceptable indoor air quality and system performance.**

Second, EPA has revised the checklist to align with ANSI / ACCA 5 QI-2007 protocol and ASHRAE 62.2-2010, including the addition of requirements for proper sizing and installation of furnaces and heatpumps. While other system types may be included in ENERGY STAR qualified homes, these system types will be exempted from many sections of the HVAC System Quality Installation Contractor checklist. Alignment with the ANSI / ACCA protocol also resolves many of the concerns expressed by respondents about testing tolerances, terminology, acceptable methods of testing, feasibility of test requirements, and mention of company-specific products. Notable changes for these components of the checklist include the following:

- **Rather than requiring a specific sensible heat ratio for the cooling equipment, the HVAC designer shall compare the latent capacity of the selected equipment to the latent load of the rated home and, where the load is not met, install an ENERGY STAR qualified dehumidifier.**
- The person responsible for the heating, cooling, and ventilation design, whether it be the HVAC technician or someone else, shall be responsible for completing and signing the design sections of the contractor checklist.
- Systems that are not AHRI rated may be used, as long as a copy of OEM-provided catalog data indicating acceptable combination selection and performance data is provided.
- The following guidance on the field installation of TXV’s has been added: “TXV sensing bulbs shall be insulated and tightly clamped to the vapor line with good linear thermal contact at the recommended orientation, usually 4 and 8 o’clock.”
- The minimum allowed filtration level has been reduced from MERV 8 to MERV 6.

Third, in response to concerns from respondents and building science experts about air quality, EPA has added the requirement that combustion appliances (including space heating and water heating systems) inside the home’s pressure boundary must be direct-vented or mechanically vented to outdoors and, as a result, has removed the requirement for CO detectors.

Fourth, EPA has clarified the requirements of the Rater checklist to help ensure consistent interpretation and enforcement. Changes include the following:

- The checklist now indicates which duct system types the insulation, installation, and leakage requirements apply to. Duct quality installation requirements apply to all HVAC, ventilation, exhaust, and pressure-balancing ducts; duct insulation requirements apply to all HVAC, balanced-ventilation, and pressure-balancing ducts; duct leakage requirements apply to all HVAC and balanced-ventilation ducts.
- **The checklist now indicates which items require measured values versus visual inspection. Items that must be measured by the Rater include: supply flow at bedroom registers (or equivalent pressure test) to determine compliance with pressure-balancing requirement; total duct leakage; leakage to the outside; ventilation fan flow rate; exhaust fan flow rates; and, for a limited number of homes, net exhaust or net supply flow.**
- The following three requirements have been added:
 - Building cavities shall not be used as supply or return ducts.
 - Ducts shall not be installed in insulated walls
 - Exhaust fans and duct boots shall be sealed to floor, walls, or ceiling using caulk, foam, or mastic
- **The requirement for no duct bends over 90° has been clarified as follows: “Connections and routing of ductwork completed without kinks or sharp bends, where kinks are caused when ducts are bent across sharp corners such as framing members and sharp bends occur when the radius of the duct centerline is less than one duct diameter.”** This will allow partners to install ductwork with greater than 90° bends as long as the bends are gradual.
- **The requirement for no looped ductwork has been clarified as follows: “Ducts shall not include coiled or looped ductwork except where needed for acoustical control. Balancing dampers shall be used instead of loops to limit flow to diffusers.”**
- The requirement to ensure that air inlets are not obstructed by snow, plantings, or other material has been clarified to indicate that this must be true only at the time of inspection, because raters do not have control over what will occur after inspection. To help address this fact, a requirement has been added that the inlets must be at least 2 ft. above grade in Climate Zones 1-3 and at least 4 ft above grade in Climate Zones 4-8.
- EPA has relocated the requirement for ENERGY STAR qualified exhaust fans with the other ventilation requirements and has clarified the ventilation and exhaust fan rating requirements as follows:
 - Intermittent exhaust fans shall be ENERGY STAR qualified; unless rated flow rate > 400 CFM;
 - Continuous exhaust fans shall be ENERGY STAR qualified & rated at < 1 sone;
 - Intermittent supply fans rated at < 3 sone, unless rated flow rate > 400 CFM;
 - Continuous supply fans rated at < 1 sone

Water Management System Rater and Builder Checklists:

EPA has renamed the originally proposed Water-Managed Construction checklist to the Water Management System Checklist and has created one checklist for Raters and one checklist for Builders. Approximately half of the number of the items originally proposed has been relocated to the builder checklist, including the items related to roof and foundation inspections, moisture content, and water damage. The remainder has been relocated to the rater checklist. The new checklists have undergone significant reorganization to help ensure effective and efficient compliance.

First, in addition to creating one checklist for Raters and one checklist for builders, EPA has clarified that builders will be responsible for verifying all of the items on the builder checklist and has added two additional allowances for builder-verified items on the rater checklist for further flexibility. These two changes should address the majority of respondents’ concerns about the need for more than two site visits.

Second, to further ease implementation, EPA has simplified or eliminated several of the originally proposed requirements. These include:

- Removal of the requirement that piping in exterior walls be installed with insulation.
- Relocation of the requirement that walls not be enclosed with high moisture content to the checklist for builders. Therefore, it will be the responsibility of the builder to assess compliance with this requirement. EPA has also clarified that for wet-applied insulation products, builders should follow manufacturer’s drying recommendations and that lumber should not exceed 18% moisture content.

Third, to address liability concerns, EPA has added a disclaimer that completion of the Water Management System Checklists does not constitute a guarantee that the home will avoid all moisture-related problems.