



April 14, 2010

Dear Partners,

During the second comment period for the proposed 2011 ENERGY STAR New Homes guidelines, EPA received over 140 pages of comments from respondents. EPA has reviewed all comments and has greatly refined the 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.

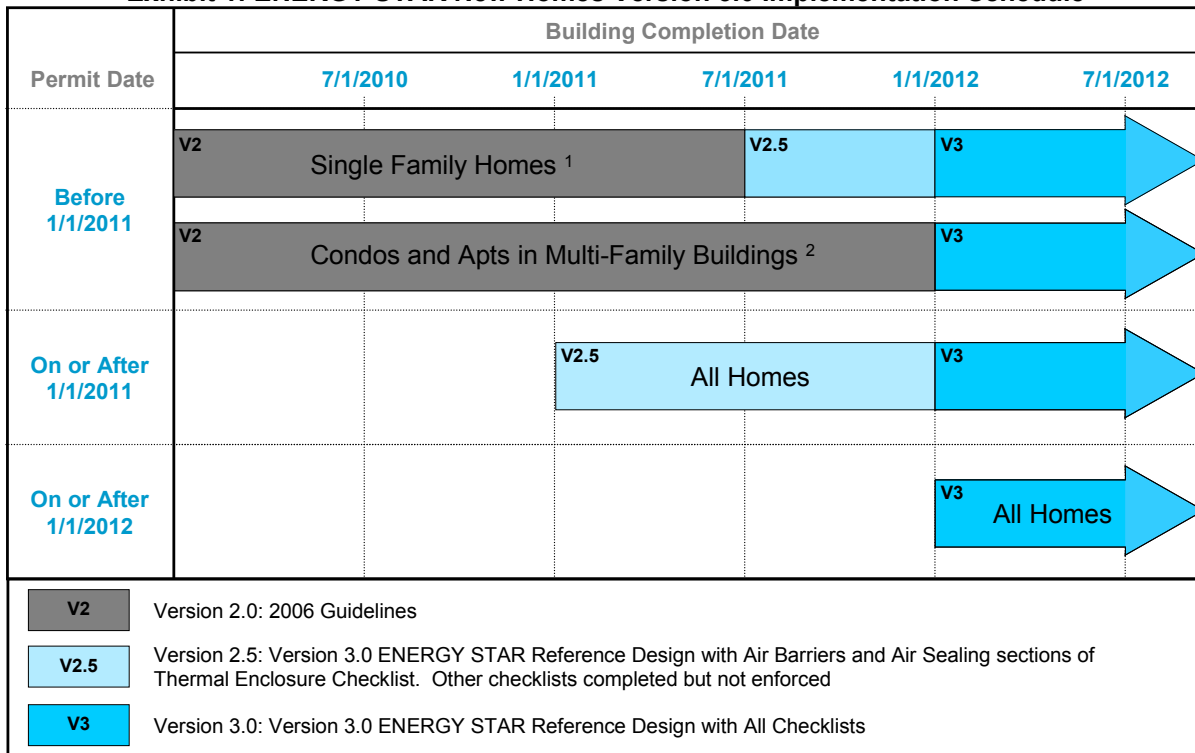
The summary of the most significant changes is organized by topic, including a section on:

- Implementation Timeline
- The ENERGY STAR Reference Design, Prescriptive Path, & Performance Path
- The Thermal Enclosure System Rater Checklist
- The HVAC System Quality Installation Rater & Builder Checklists
- The Water Management System Checklists

**Implementation Timeline:**

EPA has modified the implementation timeline by allowing additional time for multi-family buildings to transition to the version 3.0 requirements. Furthermore, it has clarified that some homes may use a transitional version of the guidelines during the 2011 calendar year, named v2.5, which is composed of the version 3.0 ENERGY STAR Reference Design coupled with the Air Barriers and Air Sealing sections of Thermal Enclosure Checklist. Under this version 2.5, the other inspection checklists shall be completed but not enforced. The revised implementation timeline is illustrated in Exhibit 1.

**Exhibit 1: ENERGY STAR New Homes Version 3.0 Implementation Schedule**



1. Single-family homes include detached homes, townhomes, rowhomes, duplexes, and triplexes.  
 2. Only condos and apartments in multi-family buildings may use this extended implementation schedule. Further, all multi-family homes financed through low-income housing agencies and permitted prior to January 1, 2011 may earn the ENERGY STAR under the last iteration of the guidelines, Version 2.0, until January 1, 2013.

### **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, several details of the proposal in the second draft have been further modified to accommodate respondents' concerns and questions and many minor edits have been made to clarify the intent of the guidelines and eliminate inconsistencies.

- The Size Adjustment Factor has been set to 1.0 for condos and apartments in multi-family buildings. Because these homes would rarely be large enough for the Size Adjustment Factor to apply, this should simplify the program for this housing sector. This exemption does not apply to single-family detached homes, townhomes, rowhomes, duplexes, or triplexes.
- The definition for conditioned floor area has been aligned with RESNET standards.
- The process of manually configuring the ENERGY STAR HERS Reference Design has been further clarified, including a more explicit indication of items that will be automatically align with RESNET standards and need not be modified by the user.
- In addition to the options to use R-values and assembly U-values, total UA has been added as an option to demonstrate compliance with the requirement that qualified homes meet or exceed the insulation levels defined in the 2009 IECC.
- The efficiency of ground-source heatpumps in the ENERGY STAR Reference Design have been defined by ground-loop type and increased to align with the levels that will be required by the ENERGY STAR geothermal heatpump program beginning on 01/01/2011.
- An exemption has been added to the prescriptive path allowing fenestration to exceed the required SHGC when used as a part of passive solar design.
- The National Program Requirements and the ENERGY STAR HERS Index Target Procedure documents have been updated with required efficiencies for oil-fired water heaters.

### **Thermal Enclosure System Rater Checklist:**

The Thermal Enclosure System Rater checklist has remained virtually unchanged since the second draft, apart from minor editorial changes, reorganization of items, and clarifications. The following list represents the more significant modifications:

- The option to use continuous insulated sheathing to meet thermal bridging requirements has been simplified and slightly reduced in stringency as follows:  $\geq R-3$  in Climate Zones 1 to 4;  $\geq R-5$  in Climate Zones 5 to 8. The requirements for insulated headers have also aligned with these definitions. Furthermore, insulated siding may be used to meet this requirement as long as the insulated siding provides the required R-value at its minimum thickness and is attached directly over the water-resistive barrier and sheathing.
- Whole-house fans, attic access panels, and dropdown stairs must be equipped with an insulated cover  $\geq R-10$ , and gasketed to the opening. Whole-house fans must also be installed either on the house side or mechanically operated.
- EPA has clarified that rigid air barriers are recommended, but not required. However, if flexible air barriers are used, they shall not be made of materials that are easily torn, including paper-based products such as kraft paper.
- A new checklist item has been added to the air sealing section to ensure that rough openings around windows and doors are sealed with caulk or foam.

### **HVAC System Quality Installation Rater and Contractor Checklists:**

The HVAC System Quality Installation checklists have also remained conceptually similar to the second draft. However, several significant refinements have been made regarding combustion appliances and design prohibitions. In addition, many minor edits have been made to improve the clarity, consistency, and organization of the checklist. The following list represents the more significant modifications:

- The requirements for combustion appliances have been refined, as follows:
  - Furnaces, boilers, and water heaters located within the home's pressure boundary shall be mechanically drafted, direct-vented to outdoors, or in Climate Zone 1-3 atmospherically vented. For atmospherically vented furnaces, boilers, and water heaters within the home's pressure boundary, the Rater must conduct BPI's combustion safety test procedure and determine that the CO test results are less than 25 ppm and the combustion appliance zone depressurization limit is not exceeded;

- If atmospherically vented fireplaces are located inside the home's pressure boundary, total net rated exhaust flow of the two largest exhaust fans (excluding summer cooling fans) is < 15 CFM per 100 sq. ft. of occupiable space when at full capacity
- In alignment with ASHRAE 62.2-2007, this version of the ENERGY STAR New Homes guidelines does not address unvented combustion space heaters
- The terminology and definitions for direct-vent and mechanical draft systems have been aligned with the 2009 International Mechanical Code (IMC).
- In addition to the prescriptive options, compliance with bedroom pressure-balancing requirements may be demonstrated by achieving a measured pressure differential  $\leq 3$  Pa with respect to the outside when bedroom doors are closed and the air handler is operating.
- For homes that are  $\leq 1,200$  sq ft, duct leakage limits to the outdoors have been increased from 4 to 5 CFM25 per 100 sq ft of conditioned area and total duct leakage has been increased from 6 to 8 CFM25 per 100 sq ft of conditioned area. This change has been made due to the difficulty of achieving an air-tight air handler, which for small homes may comprise a majority of the system leakage.
- The use of building cavities as supply and return ducts is now allowed, but only if the cavities are functionally equivalent by meeting the duct insulation and leakage requirements.
- The limitation on the amount of sag in flexible ducts has been eliminated. Instead, flexible ducts will only be required to be supported at intervals as recommended by the manufacturer but at a distance  $\leq 5$  ft. EPA will consider adding additional requirements in future iterations of the guidelines.
- A requirement has been added that ventilation inlets located on the roof deck must extend 2 or 4 ft above the surface, depending on climate. This is an extension of the requirement regarding minimum height requirements above-grade for ventilation inlets.
- Exterior penetration requirements have been revised as follows: HVAC ducts, cavities used as ducts, and combustion inlets and outlets may pass perpendicularly through exterior walls but shall run within exterior walls unless at least R-6 continuous insulation is provided on exterior side of the cavity, along with an interior and exterior air barrier where required by the Thermal Enclosure Checklist.
- In the performance path, the requirement for ENERGY STAR qualified exhaust fans has been limited just to exhaust fans that are part of a whole-house ventilation system.
- Due to concerns about excessive energy use from central HVAC fans, an ECM or ICM motor is required if the HVAC fan is used in a whole-house ventilation system. Furthermore, whole-building mechanical ventilation design requirements have been updated to prohibit the use of an intake duct on the return side of the HVAC system, unless it is coupled with a motorized damper and control system.
- The requirement that air-handlers and return ducts not be located within the garage has been eliminated based on respondent concerns that ducts relocated to attics or crawlspaces may not offer improved air quality.
- Several items proposed for verification on the second draft of the HVAC System Quality Installation Contractor checklist have been eliminated because they are not integral to assessing performance in new systems. Items eliminated include the measurement of air temperatures in heating mode, supply side air temperatures in cooling mode, return side dry-bulb temperature in cooling mode, and the reporting of furnace net capacity.

### **Water Management System Rater and Builder Checklists:**

EPA received significant additional feedback regarding the Water Management System Rater and Builder checklists during the second comment period. Many respondents expressed concern about the difficulty of integrating the verification of the checklist items into the builder's workflow due to the limited window of time that many items would be available for inspection. In response, the proposed Water Management System Rater and Builder checklists have been integrated into a single builder checklist. The revised Water Management System Builder Checklist encompasses many of the items on the former Rater checklist, but reduces the verification burden by making the builder responsible for this important component of ensuring a high-quality energy efficient home. Other noteworthy edits include:

- Below-grade exterior wall requirements have been updated to prohibit the use of materials with permeability ratings less than or equal to 0.1, which align with the Indoor AirPLUS program. The second draft prohibited materials with a rating of less than 1.0, which may have inadvertently excluded the use of rigid and closed-cell foam.
- Regarding vapor barriers for crawlspaces, polyethylene sheeting that is  $\geq 6$  mil and lapped 6-12 in. may be used without the need to seal the seams between sheets. However, the sheeting still must be attached to the bottom of walls or piers with furring strips or equivalent to help ensure that the sheeting is not disturbed.
- Polystyrene insulation that is  $\geq 1$ " may be used in place of sheeting to create a capillary break beneath slabs.
- The requirements for backing behind tubs and showers has been clarified. Cement board or equivalent moisture-resistant backing material shall be installed on walls behind tub and shower enclosures composed of tile or panel assemblies with caulked joints. Paper-faced backerboard shall not be used. Monolithic tub and shower enclosures (e.g., fiberglass with no seams) are exempt from this backing material requirement unless required by the manufacturer. Paper-faced backerboard may only be used behind monolithic enclosures and only if it meets ASTM mold-resistant standards.