

DOE Responses to
DOE Challenge Home
(formerly *Builders Challenge*)
National Program Requirements
Public Comments

DOE received comments on the draft DOE Challenge Home specifications and requirements from December 15, 2011 through January 31, 2012. This document summarizes the comments received, DOE's responses, and the resulting policy change, if any.

All comments were reviewed. Similar comments were grouped together in the responses. Editorial comments and general observations were considered, but are not listed in the responses below unless they involved a significant clarification to the DOE Challenge Home provisions.

DOE is not responsible for any typographical errors or omissions.

List of Comment & Response Topics

| | |
|---|----|
| HERS Index in BC2 Labeling..... | 6 |
| ENERGY STAR Homes V3 Certification | 7 |
| DOE Challenge Home - Target Home..... | 7 |
| Too Many Efficiency Labeling Programs | 7 |
| Fortified for Safer Living Program Docs | 8 |
| Sampling..... | 8 |
| ES V3 as a Mandatory Requirement | 8 |
| ES V3 as a Mandatory Requirement | 9 |
| ES Homes in NW..... | 9 |
| Home Energy Score..... | 9 |
| Need to update Building America Documents | 9 |
| Flexibility in Meeting Program Requirements | 9 |
| 2012 IECC Insulation Levels - Support..... | 9 |
| 2012 IECC Insulation Levels - Too Lenient | 10 |
| 2012 IECC Insulation Levels - Too Stringent..... | 10 |
| 2012 IECC Insulation Levels - Methods of Compliance..... | 10 |
| ENERGY STAR Fenestration - Support..... | 10 |
| ENERGY STAR Fenestration - Methods of Compliance | 10 |
| ENERGY STAR Fenestration - Negative | 10 |
| ENERGY STAR Fenestration - High Altitude | 11 |
| ENERGY STAR Fenestration - Too Restrictive..... | 11 |
| ENERGY STAR Fenestration - Conflicts in NW | 11 |
| Ducts within Conditioned Space - Support..... | 11 |
| Ducts within Conditioned Space - Alternatives..... | 12 |
| Ducts within Conditioned Space - Exceptions..... | 12 |
| Ducts within Conditioned Space - Clarification on Location..... | 12 |
| Duct Leakage Levels | 13 |
| WaterSense Provisions - Verification..... | 13 |
| Hot Water Distribution - Too Stringent | 13 |
| Water Efficiency - Flexibility..... | 14 |
| Water Heating System Efficiency - Use of IECC | 14 |

| | |
|--|----|
| WaterSense - Ability to Select Qualifying Fixtures | 14 |
| WaterSense Provisions - General..... | 14 |
| ENERGY STAR Appliance - QA | 15 |
| ENERGY STAR Appliances - Support..... | 15 |
| ENERGY STAR Appliances - Flexibility for Alternatives | 15 |
| ENERGY STAR Lighting - Support..... | 15 |
| ENERGY STAR Lighting - Cost Concern | 15 |
| ENERGY STAR Lighting - Permanency | 15 |
| ENERGY STAR Lighting - Clarification on Bulbs or Fixtures | 15 |
| ENERGY STAR Lighting - Terminology | 16 |
| ENERGY STAR Lighting - Too Lenient | 16 |
| Ventilation & Ceiling Fans - General Support, Controls..... | 16 |
| Ventilation - Kitchen and Garage Fan Efficiency | 16 |
| Ventilation - Field Air Flow Testing | 16 |
| Ventilation - Support of HRVs | 16 |
| Ventilation - Need for All Bath Fans to be ENERGY STAR | 17 |
| Ventilation - Ceiling Fan Cost | 17 |
| Indoor airPLUS as a Mandatory - Support | 17 |
| Indoor airPLUS - Concern over Radon Provisions | 17 |
| Indoor airPLUS - Does this Satisfy ENERGY STAR for Homes V3? | 17 |
| Indoor airPLUS - Too Stringent | 18 |
| Indoor airPLUS - Need for Flexibility | 18 |
| Indoor airPLUS - Product Availability Issue..... | 18 |
| Indoor airPLUS - Referencing ASHRAE 62.2 | 18 |
| Indoor airPLUS - ENERGY STAR Wood Burning Fireplace? | 18 |
| Indoor airPLUS - Effectiveness of Garage Ventilation? | 19 |
| RERH PV Checklist - Support | 19 |
| RERH PV Checklist - Need for Anchor Fall Safety System? | 19 |
| RERH PV Checklist - Need for Mounting Panel? | 19 |
| RERH PV Checklist - Need for Breaker? | 20 |
| RERH PV Checklist - Cost Effectiveness..... | 20 |
| RERH PV Checklist - Architectural Drawings & Liability | 20 |
| RERH PV Checklist - Documentation on Checklist Provisions | 20 |
| RERH Checklists - Inclusion of Geothermal..... | 21 |

RERH Checklists - Applicability on Low Solar Resource Sites 21

RERH SWH Checklists - Support 21

RERH SWH Checklists - Exceptions for when High Efficiency Tankless is Used 21

RERH SHW Checklist - Need for Anchor Fall Safety System? 22

RERH SHW Checklist - Need for Mounting Panel? 22

RERH SWH Checklists - Exceptions for when High Efficiency HPWH is Used 22

RERH SWH Checklists - Too Stringent 22

HVAC Target Home Efficiencies - Big Increase 23

Target Home AFUE - 90 in Hot Climates 23

Target Home AFUE - Support for Hot Climate Targets 23

Target Home AFUE - Support for Mixed Climate Targets 23

Target Home AFUE - Cold Climate Targets 24

Target Home SEER - SHR in Load Sizing 24

Target Home SEER - Blower Shutoff in Hot/Humid Climates 24

Target Home SEER - Hot Climates 24

Target Home SEER - System Charging Requirements 24

Target Home SEER - Mixed Climates 25

Target Home SEER - Cold Climates 25

Target Home HSPF - Hot Climates 25

Target Home HSPF - Provisions for Cold Climate Heat Pumps 25

Target Home GSHP Efficiency - Inclusion of Pumping Energy 26

Target Home Efficiency Requirements - Gas vs. Electric Efficiency Requirements 26

Target Home GSHP Efficiency - Too Stringent 26

Target Home Whole House Ventilation - System Types 26

Target Home Whole House Ventilation - ASHRAE 62.2 Rates 27

Target Home Whole House Ventilation - HRV Performance Levels for Mixed Climates 27

Target Home Whole House Ventilation - Enforceability 27

Target Home Whole House Ventilation - Cold Climate Specs 27

Target Home 2012 IECC Insulation Levels - Support 27

Target Home 2012 IECC Insulation Levels - Too Lenient 28

Target Home 2012 IECC Insulation Levels - Importance of Air Movement 28

Target Home 2012 IECC Insulation Levels - Importance of HVAC 28

Target Home R-4 Duct Insulation - General 28

Target Home R-4 Duct Insulation - Necessity 29

| | |
|--|----|
| Target Home Infiltration Rates - Combustion Safety..... | 29 |
| Target Home Infiltration Rates - Hot Climates..... | 29 |
| Target Home Infiltration Rates - Mixed Climates | 29 |
| Target Home Infiltration Rates - Cold Climates | 30 |
| Target Home Infiltration Rates - Very Cold Climates..... | 30 |
| Target Home SHGC - Passive Solar Flexibility | 30 |
| Target Home U Values - General | 30 |
| Target Home WFA - Prescriptive Compliance..... | 31 |
| Target Home WFA - Clarification of when U/SHGC Adjustments are Applied | 31 |
| Target Home WFA - Limiting Window Area undermines Passive Solar..... | 31 |
| Target Home - ENERGY STAR Water Heater - Support | 31 |
| Target Home - ENERGY STAR Water Heater - Use of Tank Systems..... | 32 |
| Target Home - ENERGY STAR Water Heater - Use of Electric Tank Systems and Use of Standby Losses..... | 32 |
| Target Home - ENERGY STAR Water Heater - Limits on Use of Electric Tank Systems..... | 32 |
| Target Home - ENERGY STAR Water Heater - Limits on Natural Draft Systems | 32 |
| Target Home Programmable T-Stat - Support | 33 |
| Target Home Programmable T-Stat - Applicability and Effectiveness..... | 33 |
| Target Home Appliances - Defining Efficiency Levels | 33 |
| Target Home Appliances - Support..... | 33 |
| Target Home Appliances - Projects without Appliances..... | 33 |
| Utility Billing Data Requests - Support..... | 34 |
| Uses of Max Energy Use Metric instead of HERS Index..... | 34 |
| Resources for Partners - Design Assistance | 34 |
| Resources for Partners - Marketing Resources..... | 35 |
| Resources for Partners - Lack of Consumer Demand | 35 |
| Resources for Partners - Leveraging Builder Partners | 35 |
| General Comments - Flexibility in Meeting Requirements..... | 35 |
| Partner Resources - Resources Proving Value | 36 |
| Timeline - New Specification Phase-In..... | 36 |
| Timeline - Completion Date for Use of Existing (Builders Challenge) Specification | 36 |
| Timeline - Phase-In for Affordable Housing Projects..... | 37 |
| Footnote Comments - Organization of Program Requirements..... | 37 |
| Footnote Comments - Defaulting to Local Energy Code Requirements..... | 37 |
| Footnote Comments - Allowable Contribution of Renewables | 38 |

Footnote Comments - Vapor Retarder Provisions..... 38

Footnote Comments - Duct Leakage Testing..... 38

Footnote Comments - Duct Leakage Testing & IECC Protocol..... 38

Footnote Comment - Solar Radiation Map Referenced in RERH Applicability 39

Footnote Comment - Referencing 2012 IECC Climate Zones 39

Footnote Comments - Use of HPWH Units as Part of WH Mech Ventilation 39

Footnote Comment - Allowable Methods for Complying with 2012 IECC Insulation Levels..... 40

Footnote Comment - Infiltration Testing Methods 40

Footnote Comment - Explanation of Window Area Exception..... 40

Footnote Comment - R-5 Windows 41

Footnote Comment - Adaptive Recovery for Programmable T-Stats..... 41

| ID | Topic | Comment Summary | DOE Response | DOE Policy Decision |
|----|----------------------------|---|---|---|
| 1 | HERS Index in BC2 Labeling | When asked about the discontinuation of the E-Scale as a label for DOE Challenge Homes, many respondents strongly prefer to keep this element of the DOE Challenge Home label as a means of differentiation and recognition. A few respondents felt that the HERS Index label, available from RESNET, would be an adequate alternative. A few respondents favored moving away from the E-Scale, citing concerns about too many labels in the market, concerns with the underlying RESNET rating, or a desire to use the Energy Performance Score instead. | DOE acknowledges the value that DOE Challenge Home (Builders Challenge) partners have gained from the E-Scale and the underlying HERS Index within this label. In response to the numerous comments supportive of the current BC label, DOE will work with RESNET and the rating software developers to integrate a HERS Index with the look/feel of the E-Scale into the DOE Challenge Home documentation. | DOE will integrate the feedback from stakeholders into the development of the DOE Challenge Home documentation. |

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| 2 | ENERGY STAR Homes V3 Certification | Multiple respondents questioned if DOE Challenge Homes have to be ENERGY STAR for Homes V3 certified and labeled, or if they can merely comply with the checklists and provisions of ENERGY STAR for Homes V3? | DOE Challenge Homes must be certified and labeled under ENERGY STAR Qualified Homes Version 3. This alignment reduces market confusion, and establishes DOE Challenge Home levels of performance as the highest federally recognized tier of home performance. | Language in Exhibit 1, Item 1 of DOE Challenge Home National Program Requirements will be clarified. |
| 3 | DOE Challenge Home - Target Home | Several respondents noted difficulty in meeting the specifications of the DOE Challenge Home Target Home (Exhibit 2) or had questions regarding the exact composition of the Target Home. | The DOE Challenge Home Target Home is defined by the specifications listed in both Exhibit 1 (Mandatory Requirements for All Labeled Homes) and Exhibit 2. For the first few months of Version 2 operations (starting 4/1/2012), Raters will manually determine the Target Home HERS Index until updated rating software is released. It is also very important to note that the specifications in Exhibit 2 are not mandatory, and qualifying homes can vary from these provisions as long as all Mandatory Requirements are met and the home achieves the Target Home HERS Index. | No policy change. |
| 3A | Too Many Efficiency Labeling Programs | One respondent questioned the need for an additional home energy performance labeling program and also proposed that DOE Challenge Home be based on ICC 700. | DOE is eager to recognize the builders of the top performing homes in the market and providing them with a systems-based (rather than points-based) way to design, build, and market leading edge homes. DOE is also excited to position the DOE Challenge Home as a complimentary leading edge to ENERGY STAR for Homes V3. By keeping these 2 federal labeling programs consistent but also offering a different value proposition for DOE Challenge Home partners, DOE feels it is serving the market and encouraging ultra high performance homes. DOE also supports the efforts of ICC 700 as a green building program, which builders may also use to design, build, and market homes. | No policy change. |

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| 4 | Fortified for Safer Living Program Docs | One respondent requested that the Fortified for Safer Living building specifications be included in the program documents. | Because DOE Challenge Homes will be so well designed and built for energy efficiency, IAQ, and moisture management - it makes sense that these homes undergo provisions to go beyond code minimums for resistance to natural disasters. Accordingly, DOE is encouraging - but not requiring - that DOE Challenge Homes incorporate disaster resistance measures (appropriate for the project location) as specified in the Fortified for Safer Living - Builders Guide from the Institute for Business & Home Safety. This guide, or a link to this guide, will be made available on the DOE Challenge Home website. DOE does not intend to list this recommendation in the National Program Requirements at this time because this document only contains required program elements. | No policy change. |
| 5 | Sampling | DOE examined the DOE Challenge Home approach to sampling and wants to clarify this for program partners. | To simplify program compliance, the DOE Challenge Home incorporates that same approach to sampling as ENERGY STAR for Homes V3 (Rev 5). Note that where V3 stipulates that sampling is not permitted for the Water Management checklist, BC V2 stipulates that sampling is not permitted for the Indoor airPLUS checklist (which is a mandatory checklist within BC V2). | Sampling provisions have been added to DOE Challenge Home National Program Requirements. |
| 6 | ES V3 as a Mandatory Requirement | Several respondents were supportive of ENERGY STAR for Homes V3 qualification being a Mandatory requirement for DOE Challenge Homes. | Alignment of DOE Challenge Home with ENERGY STAR makes sense for the housing industry. ENERGY STAR ensures every labeled home benefits from a comprehensive building science package. DOE Challenge Home offers more for builders/buyers who want to ensure their home meets future levels of performance including ultra-low utility bills, designing for comprehensive IAQ, water efficiency and convenience, reduced maintenance, and the latest advanced technologies and practices from world class research. DOE Challenge Home is a leading edge builder program that builds on a great baseline set by ENERGY STAR. | No policy change. |

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| 7 | ES V3 as a Mandatory Requirement | Several respondents stated that meeting ENERGY STAR for Homes V3 will be a major burden for builders, and some of these builders will not continue with the program. | DOE recognizes difficult market conditions, but encourages builders to effectively use and market high performance homes as a differentiating feature to potential buyers. Changes to ENERGY STAR for Homes are a necessary program evolution for a voluntary, above-code program. DOE does recognize that some builders may not be able to follow the program; however we do expect the program to grow over time. DOE welcomes builders to contact us with questions. | No policy change. |
| 8 | ES Homes in NW | One respondent stated that ES Homes in the Northwest can be restrictive of innovative technologies which are efficient but not ES labeled. | DOE is actively working with the Pacific Northwest to develop mutually acceptable solutions for that region. | No policy change. |
| 9 | Home Energy Score | One responded asked the status of the Home Energy Score. | Home Energy Score is expected to be launched this summer in a phased launch. Information on the Home Energy Score can be found at http://www1.eere.energy.gov/buildings/homeenergyscore/ | No policy change. |
| 10 | Need to update Building America Documents | One respondent noted that the Building America Best Practice documents need to be updated. | DOE is shifting from the Best Practice Guides to the Building America Resource Tool as its primary source of building science content. As time/resources allow DOE will consider updating the Best Practice Guides in the future. DOE recognizes the importance of up to date and usable technical resources and will strive to shape the Resource Tool in a way that fills that need. | No policy change. |
| 10A | Flexibility in Meeting Program Requirements | One respondent stated that ENERGY STAR for Homes specs can lack flexibility, and that designs which meet/exceed the intent of a provision should be allowed. | DOE is open to alternative means of meeting the intent of provisions. Accordingly the program requirements accommodate approaches like passive solar design by offering exceptions to SHGC requirements. Further, Footnote #1 also establishes a process for alternatives which are not specifically addressed in the program requirements. | No policy change. |
| 11 | 2012 IECC Insulation Levels - Support | Several respondents supported minimum 2012 IECC envelope insulation levels, citing that they should be a minimum for qualifying homes. | Establishing the envelope to have minimum 2012 IECC insulation levels allows the DOE Challenge Home to credibly state that all qualified homes are designed to meet energy codes which will be in place in the years to come. | No policy change. |

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| 12 | 2012 IECC Insulation Levels - Too Lenient | Several respondents stated that 2012 IECC insulation levels are not stringent enough. | DOE views 2012 IECC insulation levels as a significant increase above code-minimums in many jurisdictions currently. This level of insulation is mandatory, but it is only a minimum as well. Additional thermal resistance of the building shell may be needed if the home is larger than the Benchmark Home or to make up for systems which fall below the Target Home specifications. | No policy change. |
| 13 | 2012 IECC Insulation Levels - Too Stringent | Several respondents felt that 2012 IECC levels could be overly stringent and difficult in terms of cost. | DOE Challenge Homes offer a value proposition which incorporates superior energy efficiency, ultra low utility bills, and a home which won't be below code in a couple years. To make this claim, minimum 2012 IECC envelope insulation levels have to be part of the spec. | No policy change. |
| 14 | 2012 IECC Insulation Levels - Methods of Compliance | Multiple respondents questioned the design of the requirements for 2012 IECC insulation levels - specifically the various methods of compliance and trade-offs which would be allowed. | DOE has revised the 2012 IECC insulation levels provision to be consistent with the compliance approaches and trade-offs permitted under ENERGY STAR for Homes V3. ENERGY STAR for Homes V3 uses 2009 IECC insulation levels as a baseline; however the compliance approaches can still apply to 2012 IECC. | Revised footnotes on allowable methods of compliance with 2012 IECC insulation levels. |
| 15 | ENERGY STAR Fenestration - Support | Multiple respondents supported the requirement for ENERGY STAR certified fenestration, while one respondent stated the requirement could even be more stringent. | DOE views the ENERGY STAR fenestration requirement as a key component of the message that DOE Challenge Homes are built to have ultra low utility bills and won't be below code in a few years. | No policy change. |
| 16 | ENERGY STAR Fenestration - Methods of Compliance | Multiple respondents asked if the overall collection of windows in a house could meet the ENERGY STAR specifications with an area-weighted average, or if every individual unit needed to comply. | To allow flexibility, the DOE Challenge Home spec has incorporated the same fenestration provisions found in ENERGY STAR for Homes V3, which allow for area-weighting, 15 SF of exempt window area, 1 door exception, and an exception for fenestration used as part of passive solar design. | DOE has added a footnote to the Exhibit 1 provision regarding ENERGY STAR rated fenestration. |
| 17 | ENERGY STAR Fenestration - | One respondent felt that window requirements should not be made more stringent than the current Builders | The current (V1) program requirements already require ENERGY STAR certified windows; the DOE Challenge Home spec update also requires ENERGY STAR certified windows. | No policy change. |

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| | Negative | Challenge (DOE Challenge Home) spec. | | |
| 18 | ENERGY STAR Fenestration - High Altitude | One respondent noted that ENERGY STAR windows may not be suitable for high altitude projects. | In its V6.0 Product Specification Framework Document for ENERGY STAR Fenestration, EPA addresses the issue of window performance at high altitude. It states that some manufacturers have found methods other than breather tubes (which preclude the use of argon gas and potentially reduce efficiency) to address air pressure issues. Thus, EPA does not anticipate special allowances in the criteria for products used at high altitudes. DOE intends to follow this same course. | No policy change. |
| 19 | ENERGY STAR Fenestration - Too Restrictive | One respondent proposed that there should be no specific fenestration requirement and instead an energy goal for the house, to allow more flexibility especially as the product criteria for ENERGY STAR windows change. | DOE believes that high performance fenestration is an essential part of a house that will be designed and built for excellent energy performance and ultra low utility bills. Further, ENERGY STAR product criteria for windows in place now (V5.0) as well as the likely levels in V6.0 represent readily achievable levels of performance in products that are widely available. The newly added footnote to the ENERGY STAR Fenestration provision also allows greater flexibility. | No policy change. |
| 20 | ENERGY STAR Fenestration - Conflicts in NW | One respondent stated that ES Homes in the Northwest can be restrictive of in terms of window specs and passive heating designs. | The Challenge Home will provide flexibility for passive solar. Further, DOE is working with the Pacific Northwest to assess the need for a mutually acceptable solution for that region. | DOE has added a footnote related to passive design. |
| 21 | Ducts within Conditioned Space - Support | Numerous respondents supported the mandatory requirement that ducts, if used, be located within conditioned space. | DOE acknowledges that the difficulty of this provision will vary by building type, but feels strongly that an extremely efficient, low energy cost home needs this fundamental design feature. DOE has provided some additional flexibility in meeting this design requirement, to accommodate equal performance alternatives. | Alternative approaches to 100% ducts in conditioned space have been added to National Program Requirements. |

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| 22 | Ducts within Conditioned Space - Alternatives | One respondent noted that current research into thermal protection of ducts has shown cost-effective methods which can approach the efficiency benefits of locating ducts within conditioned space, such as encapsulating ducts within spray foam and then burying them under attic insulation. | DOE recognizes the validity of this research being conducted within the Building America R&D program, and has worked with the research team to establish a performance alternative utilizing attic ducts which are SPF-encapsulated and buried under loose-fill attic insulation. | Alternative approaches to 100% ducts in conditioned space have been added to National Program Requirements. |
| 23 | Ducts within Conditioned Space - Exceptions | Multiple respondents inquired if a minimum allowance of duct work outside of conditioned space would be allowable. | DOE recognizes that certain designs may have a short length of either supply or return duct located outside of the building's thermal envelope. DOE will accommodate such designs, by allowing a length of duct $\leq 10'$ total in length, to be outside of conditioned space. This length of duct must be well insulated and tightly air sealed. Further, "jump ducts" which do not supply conditioned air but instead offer a return air pathway, may be located in attic spaces if all joints including boot-to-drywall are air sealed with mastic or foam and the duct is fully buried under attic insulation or an unvented attic assembly is used. | Alternative approaches to 100% ducts in conditioned space have been added to National Program Requirements. See the footnote for "Duct System" in Exhibit 1. |
| 24 | Ducts within Conditioned Space - Clarification on Location | One respondent requested clarification on the term "conditioned space". | With respect to the required location for ducts, DOE defines this space as being within the home's thermal and air barrier boundary. An area like a basement which receives minimal supply air, but which is still fully within the home's thermal and air barrier boundary, is acceptable. | Clarified the acceptable location for ducts in the National Program Requirements. |

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| 25 | Duct Leakage Levels | A few respondents generally supported total duct leakage ≤ 4 CFM per 100 sq. ft. of conditioned floor area; while several more proposed a higher leakage limit due to the ducts already being within the home's thermal/air barrier boundary (which will have low leakage) and the challenges of a 4% leakage limit. | DOE recognizes challenges to very tight duct leakage limits, and also understands that the Challenge Home specification requires excellent practices for the building envelope and HVAC in general. While DOE does see a performance and comfort value in reducing total duct leakage even when ducts are located within a low-leakage building envelope, at this time DOE will not require total duct tightness beyond what is required in ENERGY STAR for Homes V3 (which is total duct leakage ≤ 8 CFM25 per 100 ft ² of conditioned floor area). | Removed total duct leakage limit in the National Program Requirements. ENERGY STAR for Homes V3 qualification is still required, which means qualifying homes will have total duct leakage ≤ 8 CFM25 per 100 ft ² of conditioned floor area. |
| 26 | WaterSense Provisions - Verification | Multiple respondents asked about who is eligible to verify the mandatory WaterSense provisions in the DOE Challenge Home spec. | Under the Challenge Home, Raters are eligible to verify the hot water distribution requirements of the Challenge Home. Challenge Home is not requiring homes to meet WaterSense, but simply references the specific requirement related to hot water delivery systems. | No policy change |
| 28 | Hot Water Distribution - Too Stringent | At least one respondent noted that the hot water delivery requirements would necessitate either a plan redesign or use of a re-circulation system. | While switching to a core plumbing strategy would likely impose changes to the floor plan, alternatives are available which don't require changes to floor plan design. These include manifold systems or on-demand pumping. | No policy change |

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| 29 | Water Efficiency - Flexibility | Several respondents questioned the effectiveness of requiring indoor plumbing fixtures, toilets, and hot water distribution to meet EPA Water Sense requirements, citing concerns about the importance of water efficiency in different regions and the real energy savings which would be achieved. | DOE feels that for DOE Challenge Homes to be "future ready", water efficiency is an important component for both energy and water savings. The extent of water efficiency requirements in the current BC spec only covers indoor fixtures, toilets, and hot water distribution. DOE feels that the reasonable level of stringency of these provisions, along with the complexities of putting water efficiency requirements on a regional basis, support a uniform, national set of provisions. | No policy change |
| 30 | Water Heating System Efficiency - Use of IECC | One commenter questioned why DOE would not use the Service Hot Water provisions in the 2012 IECC instead of Water Sense requirements? | DOE is electing to be consistent with EPA's WaterSense provision for hot water distribution efficiency. For auxiliary pipe insulation requirements stemming from local codes, these can be incorporated into the design home but are not current program requirements. | No policy change |
| 31 | WaterSense - Ability to Select Qualifying Fixtures | Multiple respondents noted that design preferences for shower design or the use of a particular faucet would result in non-compliance with WaterSense faucet or shower provisions. | DOE intends that the DOE Challenge Home specification should demand leading edge energy performance, but that it does not limit design preferences which can be extremely important to builders, designers, and home buyers. Therefore, DOE is amending the water efficiency requirements to focus only on hot water distribution in this program update cycle. | DOE will only reference section 3.3 of WaterSense, which deals with efficiency of hot water delivery systems. |
| 32 | WaterSense Provisions - General | Multiple respondents commented on the use of the entire WaterSense specification. Some recommended this, others did not, others recommended more stringent provisions, and finally others had the impression that the entire Water Sense spec (indoor + outdoor) was mandatory. | DOE recognizes the value of both indoor and outdoor water efficiency and conservation. As a result - there is special recognition for builders who comply with the full WaterSense specification (indoors + outdoors). As an initial attempt to address water conservation the Challenge Home will be focusing only on the hot water distribution component of WaterSense. This emphasis is based on prioritizing those efficiency measures which have long-term opportunity costs if they are not completed during initial construction. | Clarification footnote added to the National Program Requirements referencing only Section 3.3 of WaterSense. |

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| 33 | ENERGY STAR Appliance - QA | One commenter asked about the quality assurance behind the ENERGY STAR label on appliances. | The ENERGY STAR program now requires that product manufacturers submit product test results from an approved, outside laboratory before gaining ENERGY STAR certification. | No policy change |
| 34 | ENERGY STAR Appliances - Support | Several respondents support ENERGY STAR certification for installed dishwashers, clothes washers, refrigerators, bathroom ventilation fans, and ceiling fans. | DOE recognizes the value of ENERGY STAR certified appliances in meeting the performance goals of DOE Challenge Homes. Such appliance upgrades are also typically cost-effective. | No policy change |
| 35 | ENERGY STAR Appliances - Flexibility for Alternatives | One commenter expressed concerns that innovative appliances/technologies that are not listed as ENERGY STAR would not meet this provision. | Footnote #1 in the DOE Challenge Home National Program Requirements provides an alternative approach for technologies and approaches which meet the intent of specific provisions in the specs. | No policy change |
| 36 | ENERGY STAR Lighting - Support | Numerous respondents supported the provision for 80% ENERGY STAR fixtures/bulbs. | DOE feels that high efficacy lighting is very effective technology for ultra high performance homes, while requiring only 80% affords some flexibility. | No policy change. |
| 37 | ENERGY STAR Lighting - Cost Concern | One commenter stated that this extent of high efficiency lighting did not justify the expense. | DOE feels that high efficacy lighting is a very cost-effective technology in ultra high performance homes. Further, the 80% requirement is only slightly higher than the 2012 IECC which requires 75% of fixtures to have high efficacy lamps. | No policy change. |
| 38 | ENERGY STAR Lighting - Permanency | One commenter noted that homeowners sometimes swap out high efficacy bulbs after moving in. | DOE recognizes that homeowners can impact lighting energy as well as many other facets of residential energy use. However, many homeowners - especially buyers of DOE Challenge Homes - will embrace the energy performance of their homes. | No policy change. |
| 39 | ENERGY STAR Lighting - Clarification on Bulbs or Fixtures | One respondent asked for clarification if the bulbs or the fixtures have to be ENERGY STAR. | The intent of the requirement follows the structure in the IECC which allows the lighting efficiency requirement to be met by a percentage of fixtures or a percentage of lamps (bulbs). Either the fixtures or the bulbs can meet the requirements. | Clarified language on lighting requirement in National Program Requirements document. |

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| 40 | ENERGY STAR Lighting - Terminology | One commenter requested the use of the term "lighting outlets" instead of bulbs or fixtures per the IRC terminology. | The 2012 IECC uses the terms lamps (meaning bulbs) and fixtures. DOE policy recognizes the IECC as the model energy code and will therefore use terminology consistent with the IECC. | No policy change. |
| 41 | ENERGY STAR Lighting - Too Lenient | One commenter stated that 100% of lighting should be ENERGY STAR, citing that 80% was too lenient. | Mandatory items within the DOE Challenge Home are designed to assure "must have" levels of performance from specific building systems, balanced against providing as much flexibility as possible. In the case of lighting, requiring 80% of lighting to be ENERGY STAR sets the bar high but still offers some flexibility. DOE anticipates many builders will go beyond 80% to meet the Target HERS Index. | No policy change. |
| 42 | Ventilation & Ceiling Fans - General Support, Controls | Multiple respondents were supportive of the requirement for ENERGY STAR rated bath ventilation and ceiling fans, and also urged that bath fans be controlled by a humidistat or a timer. | ENERGY STAR rating on bath fans also helps assure quiet operation. Automated controls are not required but are likely to be used, especially if local bath exhaust fans are also used for whole-house mechanical ventilation. | No policy change. |
| 43 | Ventilation - Kitchen and Garage Fan Efficiency | One respondent proposed that exhaust ventilation in garages and kitchens should also be ENERGY STAR rated. | DOE may consider such a change in the future for DOE Challenge Home. At this time, product availability and energy savings potential are 2 concerns with such a requirement. | No policy change. |
| 44 | Ventilation - Field Air Flow Testing | One commenter noted the importance of also testing the exhaust CFM in the field. | The respondent is correct in that the ENERGY STAR for Homes V3 HVAC System QI Rater checklist requires that local exhaust air flows shall be measured by the Rater using a flow hood, flow grid, anemometer. | No policy change. |
| 45 | Ventilation - Support of HRVs | One respondent challenged the use of bathroom exhaust fans, citing the merits of HRV ventilation systems instead. | The DOE Challenge Home spec does not require standalone bath ventilation fans. It only specifies that installed bath ventilation fans must be ENERGY STAR qualified. | No policy change. |

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| 46 | Ventilation - Need for All Bath Fans to be ENERGY STAR | One respondent proposed that only exhaust fans used for whole-house ventilation should require the ENERGY STAR qualification, citing questions on the energy savings and cost impact from requiring ENERGY STAR certification for all bathroom exhaust fans. | DOE views the use of ENERGY STAR qualified bath exhaust fans as both an energy-savings measure as well as an IAQ-enhancing measure. ENERGY STAR qualified fans will provide both efficient operation and quieter operation compared to other fans. These IAQ features allow DOE Challenge Home partners to differentiate based on energy as well as a comprehensive IAQ package for the home. | No policy change. |
| 47 | Ventilation - Ceiling Fan Cost | One respondent noted that ENERGY STAR qualified ceiling fans will add some cost and limit product selection to some extent. | DOE Challenge Home partners will be able to assert that qualifying homes incorporate leading edge energy efficiency as well as a comprehensive IAQ package that is needed in such homes. DOE views ENERGY STAR qualified ceiling fans as a component in both of these messages. | No policy change. |
| 48 | Indoor airPLUS as a Mandatory - Support | Several respondents were supportive of the Indoor airPLUS checklist/specifications as a Mandatory requirement. | DOE feels that homes built to such high energy efficiency and tightness levels warrants a comprehensive IAQ approach as well. Having all qualifying homes substantially comply with Indoor airPLUS allows the DOE Challenge Home to state that all homes in the program have enacted a comprehensive IAQ package to benefit the residents. | No policy change. |
| 49 | Indoor airPLUS - Concern over Radon Provisions | Multiple respondents questioned if there is flexibility in how radon provisions within Indoor airPlus are implemented. | DOE has provided 2 exceptions to the Indoor airPLUS checklist and specifications. Radon test kits do not need to be provided to home buyers; however builders are strongly encouraged to provide educational materials on the radon resistant features in the home as well as the ability to test. Second, greater flexibility on fan controls has been provided for the provision on garage exhaust ventilation. | DOE has amended the footnote associated with the Indoor airPLUS checklist and construction specifications. |
| 50 | Indoor airPLUS - Does this Satisfy ENERGY STAR for Homes V3? | One respondent asked if complying with Indoor airPlus alleviates the need to comply with the Water Management Checklist under ENERGY STAR for Homes V3. | The ENERGY STAR for Homes V3 (Rev 5) National Program Requirements contain a mandatory requirement for a home's water management system. Home must comply with either the Water Management System Builder Checklist, or the Indoor airPLUS Verification Checklist. | No policy change. |

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| 51 | Indoor airPLUS - Too Stringent | Two respondents stated that requiring Indoor airPLUS would be too much for some DOE Challenge Home (Builders Challenge) builders, and cause them not to participate in the program. | DOE is eager to understand and discuss specific provisions within Indoor airPLUS which may be objectionable to builders. DOE is actively addressing several provisions in Indoor airPLUS as part of this public comment process. | DOE has allowed exceptions for Indoor airPLUS compliance. See the footnote for Indoor Air Quality in Exhibit 1 of the program requirements. |
| 52 | Indoor airPLUS - Need for Flexibility | One respondent requested that the Indoor airPLUS checklist allow tradeoffs, or use a points system. | DOE wants a comprehensive IAQ system, not parts of systems, or the use of a points or tradeoff based system that has not been publically vetted as Indoor airPLUS was. | No policy change. |
| 53 | Indoor airPLUS - Product Availability Issue | One respondent stated that product availability is a problem for the garage exhaust ventilation provision within Indoor airPLUS. Suitable fans have no more than a 20 minute run time delay setting, not 1 hour as the provision requires. | DOE has provided 2 exceptions to the Indoor airPLUS checklist and specifications. Radon test kits do not need to be provided to home buyers; however builders are strongly encouraged to provide educational materials on the radon resistant features in the home as well as the ability to test. Second, greater flexibility on fan controls has been provided for the provision on garage exhaust ventilation. | DOE has amended the footnote associated with the Indoor airPLUS checklist and construction specifications. |
| 54 | Indoor airPLUS - Referencing ASHRAE 62.2 | One respondent suggested specifying ASHRAE 62.2. | ASHRAE 62.2 is referenced for its provisions on whole-house ventilation systems, while other elements of Indoor airPLUS like the local exhaust requirements also reference 62.2 provisions but also go beyond them in requiring ENERGY STAR bath fans (ASHRAE 62.2 does not address ventilation equipment efficiency). | No policy change. |
| 55 | Indoor airPLUS - ENERGY STAR Wood Burning Fireplace? | One commenter noted that ENERGY STAR qualified wood burning fireplaces are cost prohibitive. | Indoor airPLUS does not require ENERGY STAR certification for wood burning fireplaces, but instead references widely available standards. | No policy change. |

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| 56 | Indoor airPLUS - Effectiveness of Garage Ventilation? | One commenter questioned the effectiveness of a garage exhaust fan and stated that it may never run. | Automatic controls would ensure that a garage exhaust fan would run, and help to exhaust pollutants which could otherwise enter the home (even when the garage-house door is opened). While a continuously operating fan could be disabled by the homeowner, DOE anticipates that builder partners will communicate the IAQ value that they are providing their buyers, which will in turn inform the buyers on how to operate the home effectively. | No policy change. |
| 57 | RERH PV Checklist - Support | Multiple respondents were generally supportive of the renewable-ready PV checklist. | DOE views the renewable ready checklists as fundamental to the DOE Challenge Home message - that qualifying homes are designed and built to optimize all building systems and ready to accommodate renewable systems which will let the homeowner eliminate their net energy use. | No policy change. |
| 58 | RERH PV Checklist - Need for Anchor Fall Safety System? | One commenter stated that a permanent roof anchor fall safety system is not required for installation. | The supporting guide to the checklist specifies that the fall safety system is recommended, but not required. This is now reflected in the program requirements. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |
| 59 | RERH PV Checklist - Need for Mounting Panel? | One commenter stated that alternatives to a 4' x 4' plywood panel for a future solar electric components should be permitted. These would include wood blocking which would not interfere with drywall finishing of the space. | DOE agrees with this suggested alternative. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |

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| 60 | RERH PV Checklist - Need for Breaker? | One commenter proposed that a labeled slot for the future installation of a double-pole breaker for use by the solar PV system is a practical alternative to installing a 70A breaker. The commenter also questioned the prescriptive sizing of this breaker. | DOE agrees with this suggested alternative. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |
| 61 | RERH PV Checklist - Cost Effectiveness | Two respondents questioned the usefulness and energy/cost savings which result from the 2 renewable-ready checklists. | DOE Challenge Homes will be marketed as leading edge and future-ready homes. This message includes the fact that the homes are built to easily and cost-effectively accommodate the installation of renewable energy systems in the future. The features in these checklists will save homeowners hundreds or thousands of dollars at the time of a future installation, and can be used as a low-cost marketing message now. | No policy change. |
| 62 | RERH PV Checklist - Architectural Drawings & Liability | One respondent noted liability issues associated with providing architectural drawings for future PV or SHW installations which will be completed by another party. | DOE has provided an alternative method of providing home buyers with the key information about the home's readiness to accommodate a future renewable system installation. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |
| 63 | RERH PV Checklist - Documentation on Checklist Provisions | Two respondents requested that the 2 renewable-ready checklists be made available on the DOE Challenge Home website. | DOE has posted the renewable checklists on the DOE Challenge Home website as part of the public comment review process. | No policy change. |

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| 64 | RERH Checklists - Inclusion of Geothermal | One commenter stated that Geothermal had been omitted from the Renewable Ready Energy Checklists | The 2 renewable ready checklists are intended to accommodate the future installation of PV and solar thermal. These systems generate electricity and thermal energy to offset energy used by the home. The DOE Challenge Home is currently limiting "renewable ready" to these 2 systems. | No change in policy |
| 65 | RERH Checklists - Applicability on Low Solar Resource Sites | Multiple commenters noted that the PV-ready and SHW-ready provisions should only apply if the site has good solar potential and a site plan which would accommodate solar. | The renewable ready checklists are only intended to apply to project sites with adequate solar resources; when a minimum size, properly oriented roof area is available; and if a solar thermal/solar electric system is not already included with the home. | DOE has amended the footnote associated with the renewable ready checklists to describe the exact conditions under which the checklists apply. |
| 66 | RERH SWH Checklists - Support | Multiple respondents were generally supportive of the renewable-ready SHW checklist. | DOE views the renewable ready checklists as fundamental to the DOE Challenge Home message - that qualifying homes are designed and built to optimize all building systems and ready to accommodate renewable systems which will let the homeowner eliminate their net energy use. | No policy change. |
| 67 | RERH SWH Checklists - Exceptions for when High Efficiency Tankless is Used | One commenter suggested an exception for the SHW checklist in cases where a high efficiency tankless water heater is used, citing that the efficiency of the tankless eliminates the future need for SHW. | DOE recognizes the efficiency of gas-fired tankless systems, but is also mindful that the originally installed water heater will provide hot water during only a relatively small portion of the home's overall life cycle. Therefore, homes with high efficiency water heaters (gas tankless and heat pump water heaters) will be exempt from a portion of the RERH Solar Hot Water checklist - including the provision requiring that a specific area be designated for the future installation of a solar storage tank. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |

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| 68 | RERH SHW Checklist - Need for Anchor Fall Safety System? | One commenter stated that a permanent roof anchor fall safety system is not required for installation. | The supporting guide to the checklist specifies that the fall safety system is recommended, but not required. This is now reflected in the program requirements. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |
| 69 | RERH SHW Checklist - Need for Mounting Panel? | One commenter stated that alternatives to a 3' x 2' plywood panel for a future solar HW components should be permitted. These would include wood blocking which would not interfere with drywall finishing of the space. | DOE agrees with this suggested alternative. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |
| 70 | RERH SWH Checklists - Exceptions for when High Efficiency HPWH is Used | One commenter suggested an exception for the SHW checklist in cases where a heat pump water heater is used, citing that the efficiency of the HPWH eliminates the future need for SHW. | DOE recognizes the efficiency of HPWHs, but is also mindful that the originally installed water heater will provide hot water during only a relatively small portion of the home's overall life cycle. Therefore, homes with high efficiency water heaters (gas tankless and heat pump water heaters) will be exempt from a portion of the RERH Solar Hot Water checklist - including the provision requiring that a specific area be designated for the future installation of a solar storage tank. | DOE has amended the footnote associated with the RERH checklist to reflect several exceptions and alternatives. |
| 71 | RERH SWH Checklists - Too Stringent | One respondent stated that the SHW-ready provisions were too aggressive at this time. | DOE is working with partners to make the renewable-ready provisions not cost-restrictive, yet also making them a true feature in the home to help market and communicate the home's design and long-term value. The public comment process is resulting in several changes to the renewable-ready checklists. | Note related changes to both the Solar PV and Solar Water Heating checklist requirements. |

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| 72 | HVAC Target Home Efficiencies - Big Increase | One commenter noted that the Target Home HVAC efficiency levels are a significant increase from the current spec. | DOE agrees with this point. The reason for the increase is a higher bar across the housing industry with upcoming increases to federal equipment standards and higher equipment efficiency targets in ENERGY STAR for Homes V3. As a leading edge energy performance program, the DOE Challenge Home Target Home HVAC efficiencies are aggressive - yet this equipment is readily available and these levels are not mandatory items (so they can be traded off). | No policy change. |
| 73 | Target Home AFUE - 90 in Hot Climates | Multiple respondents expressed that the Target Home AFUE in Hot Climates (1,2) should be 90 or higher. These same respondents were against allowing atmospherically vented furnaces to be located within conditioned space. | DOE recognizes that builders will weigh cost versus efficiency benefits of HVAC options, and that in warmer climates some may opt to use atmospherically vented furnaces. When such equipment is within the home's pressure boundary, the ENERGY STAR Homes V3 HVAC System Quality Installation Rater Checklist will require the Rater to conduct combustion safety test procedures in accordance with RESNET or BPI protocols (Item 10.1 from the HVAC Rater checklist). Builders in warm climates who opt for 90+ AFUE equipment will be "ahead" of the Target Home and can optimize their design accordingly. | No policy change. |
| 74 | Target Home AFUE - Support for Hot Climate Targets | One commenter was generally supportive of the Target Home AFUE levels in Climate Zones 1 and 2. | DOE feels that the AFUE levels in Climate Zones 1 and 2 - which are only the Target Home levels - are reasonable and afford builders flexibility. | No policy change. |
| 75 | Target Home AFUE - Support for Mixed Climate Targets | Several respondents were supportive of the Target Home AFUE levels in Climate Zones 3, 4 and 5, while one respondent suggested 92% instead of 90%. | DOE feels that a 90% AFUE as the Target Home level is reasonable and sets a strong target for heating system efficiency in the mixed climates. This level also allows builders the flexibility to go beyond 90% to offset other non-mandatory provisions. | No policy change. |

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| 76 | Target Home AFUE - Cold Climate Targets | For the Target Home AFUE level in Climate Zones 6-8, multiple respondents were generally supportive while 2 others suggested AFUE levels between 90 and 93. | Given the higher heating load found in these cold climates, DOE sees cost-effective energy savings in the 94 AFUE target. This is the Target Home value, so if a project utilizes a 93 AFUE furnace and has low heating loads due to an excellent building shell, then the difference between 94 and 93 will likely be small and able to be made up in another area. | No policy change. |
| 77 | Target Home SEER - SHR in Load Sizing | One commenter noted that equipment Sensible Heat Ratio (SHR) should be matched to load SHR, because some high SEER equipment has poor SHR. | ENERGY STAR for Homes V3, which is a mandatory prerequisite for DOE Challenge Home under the new specs, does require that the equipment's listed sensible cooling capacity exceeds the design sensible heat gain. | No policy change. |
| 78 | Target Home SEER - Blower Shutoff in Hot/Humid Climates | One respondent noted that there should be a requirement for immediate blower shutoff after condenser shutoff, to prevent reevaporation of off the wet coil. | DOE agrees with this concept. However at this time the HVAC provisions in the DOE Challenge Home are based on the ACCA QI Standard and ENERGY STAR Homes V3. At this time DOE will encourage this practice for cooling equipment in hot/humid climates. | Footnote added to the Target Home A/C specs for hot/humid climates. |
| 79 | Target Home SEER - Hot Climates | Multiple respondents supported the Target SEER level of 18 in CZ 1 and 2, while another respondent suggested 16 SEER instead. | Given the higher cooling load found in these climates, DOE sees cost-effective energy savings in the 18 SEER target. This is the Target Home value, so if a project utilizes a slightly lower SEER unit but also has very low cooling loads due to an excellent building shell, then the "lost ground" from the lower SEER unit will be fairly small and able to be made up in another area. | No policy change. |
| 80 | Target Home SEER - System Charging Requirements | One respondent suggested that system charging requirements are necessary in the spec. | ENERGY STAR for Homes V3, which is a mandatory prerequisite for DOE Challenge Home under the new specs, does contain system charge measurements and data to be reported within the HVAC System Quality Installation Contractor Checklist. | No policy change. |

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| 81 | Target Home SEER - Mixed Climates | For the Target Home SEER level in Climate Zones 3-5, multiple respondents were generally supportive while one respondent felt a higher SEER value should apply to homes with higher cooling loads and another felt that 15 SEER is not effective in Climate Zone 5. | DOE feels that 15 SEER as a Target Home value is reasonable for a leading edge performance program. While 15 SEER may be less cost-effective in a somewhat colder area like Climate Zone 5, this also means that the penalty from using a slightly lower SEER unit will be less - so builders still have flexibility in how to meet the Target HERS Index. | No policy change. |
| 82 | Target Home SEER - Cold Climates | For the Target Home 13 SEER level in Climate Zones 6-8, multiple respondents were generally supportive while also expressing that higher cooling load homes should have a higher SEER target. Other respondents felt a SEER Target value higher than, such as 15 or 16, should apply in these climate zones. | DOE recognizes that the entire DOE Challenge Home spec is aggressive overall, and has attempted to balance climate-based energy savings potential with the Target Home specs. So in the case of cold climate target SEER values, DOE has elected to use a 13 SEER target. Builders can "gain ground" to a limited extent (due to limited cooling load) on the target home by opting for higher SEER equipment - which offers them flexibility. | No policy change. |
| 83 | Target Home HSPF - Hot Climates | Commenters either supported the 8.2 HSPF target home value in Climate Zones 1 and 2, or advocated for a slightly higher value of 9.0 | This HSPF value establishes a heating efficiency target. It affords some flexibility to go beyond the target home with a higher HSPF, although the impact would be somewhat modest because homes in these climate zones will have modest heating loads. Overall DOE feels this is a reasonable target home spec which also provides some flexibility to builders. | No policy change. |
| 84 | Target Home HSPF - Provisions for Cold Climate Heat Pumps | One commenter stated that when heat pumps are used in CZ 6-8, there should be provisions for cold climate reliability and a restriction on electric strip heat. | Air-source heat pumps used in cold climates will often incorporate electric resistance for supplemental and emergency back-up heat. However, sizing of this equipment under ENERGY STAR for Homes V3 will require proper sizing of the heat pump to minimize operation of back-up heat. | No policy change. |

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| 85 | Target Home GSHP Efficiency - Inclusion of Pumping Energy | Multiple respondents raised the issue that GSHP actual performance sometimes does not meet modeled energy performance. Pumping energy should be captured in modeling the performance of GSHP systems. | DOE agrees that pump energy must be included in the energy modeling of GSHP systems and looks to the RESNET rating standards which now include this feature. Similarly, DOE will defer to RESNET and the rating standard community on issues like rated versus actual performance of GSHP systems. | No policy change. |
| 86 | Target Home Efficiency Requirements - Gas vs. Electric Efficiency Requirements | One respondent questioned the relative efficiency requirements for gas versus electric HVAC systems, and stated that new utility-scale electric generation plants are much more efficient than the current inventory of plants. | DOE relies upon a Target HERS Index for DOE Challenge Home qualification, which is based on a reference set of specs for the Target Home. These specifications utilize the same HVAC system type and energy source as the design home. So the design home - regardless of whether it uses gas or electric HVAC - is compared to a Target Home with the same type of HVAC system. This approach avoids direct comparisons of gas versus electric within the HERS rating framework in qualifying homes for DOE Challenge Home. | No policy change. |
| 87 | Target Home GSHP Efficiency - Too Stringent | One commenter stated that the target efficiencies for GSHP systems were too stringent, and that less than 5% of GSHP systems listed on the ENERGY STAR web site would comply. | Based on the Tier 3 requirements for ENERGY STAR geothermal product criteria (effective 1/1/2012) and a listing of qualified products posted 2/16/2012, the respondent is correct that a small percentage of listed products have COP and EER ratings at levels 1.25x the ENERGY STAR product criteria. Accordingly, DOE has modified the Target Home GSHP specs to align with ENERGY STAR levels, without the 1.25 multiplier. | DOE has modified the Target Home GSHP specs to be equal to ENERGY STAR criteria for EER and COP. No multiplier is included. |
| 88 | Target Home Whole House Ventilation - System Types | Multiple respondents questioned the Target Home ventilation system specification, with specific concerns about the suitability of certain whole-house ventilation system types for use in certain climates. | DOE agrees that whole-house ventilation system designs should be climate-appropriate. Provisions in EPA Indoor airPLUS and the 2 HVAC checklists within ENERGY STAR for Homes V3 address such issues. The Target Home ventilation system information is only intended to establish the target energy performance level of the system, and is not intended as guidance on appropriate system types for given climates or house designs. | DOE has edited the Target Home specifications on ventilation, and added a clarifying footnote. |

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| 89 | Target Home Whole House Ventilation - ASHRAE 62.2 Rates | Multiple commenters expressed concern with ASHRAE 62.2 ventilation rates in hot/humid climates, and cited that lower rates mitigate humidity issues and still provide satisfactory IAQ. | DOE respects the views and experiences of builders and contractors on appropriate ventilation system types and flow rates in their region. ASHRAE 62.2 calls for minimum system requirements. Builders can design low cost systems which meet 62.2, and also educate their home buyers on how to use a ventilation system in a way which is appropriate for the climate. | No policy change. |
| 90 | Target Home Whole House Ventilation - HRV Performance Levels for Mixed Climates | One respondent proposed an HRV level of performance for the Target Home ventilation system in CZ 3-5. | DOE views the greatest energy benefits of heat exchange-type ventilation systems in the coldest climate zones, but certainly recognizes their performance benefits in the mixed climates. Designs using ventilation systems with superior performance than the Target Home spec gain flexibility elsewhere in the building design. | No Policy Change. |
| 91 | Target Home Whole House Ventilation - Enforceability | One respondent felt that the Target Home ventilation specs are unenforceable at this time. | The Target Home ventilation specs set the bar for how efficient actual designs must be. The enforceability of these provisions will be built into the rating software. DOE is in the process of working with the rating software developers so that the software will automatically generate the Target Home HERS Index, much as it does not for ENERGY STAR for Homes V3. | no policy change. |
| 92 | Target Home Whole House Ventilation - Cold Climate Specs | For the colder climate zones (6-8), commenters felt that the Target Home ventilation spec should be the same as the other climate zones, and also have caps on electric usage for the system. | DOE's purpose in establishing an HRV/ERV level of performance in CZ 6-8 is to set the target home performance at a level that represents best practice for whole-house ventilation in cold climates. Actual designs may deviate from this system type and use higher- or lower-performing systems as long as the Target Home HERS Index is met and other ventilation-related provisions are met. | No policy change. |
| 93 | Target Home 2012 IECC Insulation Levels | Multiple commenters supported the use of 2012 IECC insulation levels in the Target Home design; one commenter suggested a specific reference to | Given the objectives of the DOE Challenge Home, aligning insulation levels with the 2012 IECC is reasonable. DOE agrees that a section reference could be helpful. | No policy change. Section reference has been added to National Program Requirements. |

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| | - Support | the appropriate section of the IECC also. | | |
| 94 | Target Home 2012 IECC Insulation Levels - Too Lenient | One commenter stated that 2012 IECC insulation levels were not stringent enough. | DOE views 2012 IECC insulation levels as a significant increase above code-minimums in many jurisdictions currently. This level of insulation is mandatory, but it is only a minimum as well. Additional thermal resistance of the building shell may be needed if the home is larger than the Benchmark Home or to make up for systems which fall below the Target Home specifications. | no policy change. |
| 95 | Target Home 2012 IECC Insulation Levels - Importance of Air Movement | One respondent felt that adding R value is not helpful if convective loops undermine insulation performance. | DOE is confident that the provisions in ENERGY STAR for Homes V3 which align air and thermal barriers, as well as requiring RESNET Grade I insulation installation, ensure reliable performance from insulated assemblies. | no policy change |
| 96 | Target Home 2012 IECC Insulation Levels - Importance of HVAC | One respondent expressed concerns that adding insulation is not productive unless quality HVAC practices are implemented. | DOE is confident that the HVAC checklists (contractor and rater) within ENERGY STAR for Homes V3, as well as keeping ducts in conditioned space, will provide a high performance HVAC installation to complement a high performance envelope. | no policy change. |
| 97 | Target Home R-4 Duct Insulation - General | Multiple respondents understood the R-4 duct insulation requirement in the Target Home to mean that R-4 insulation is required for ducts outside of conditioned space. This level of insulation would not meet current energy codes. | DOE would like to clarify that the R-4 duct insulation requirement is for ducts in conditioned space. By virtue of the Mandatory Requirements in Exhibit 1, ducts in DOE Challenge Homes must be within conditioned space. However, in response to other comments on this provision, DOE is eliminating the R-4 duct insulation provision from the Target Home specs. | R-4 duct insulation provision has been removed from the Target Home specs. |

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| 98 | Target Home R-4 Duct Insulation - Necessity | For those respondents who read the spec as requiring R-4 duct insulation for ducts within conditioned space, one felt this was reasonable to prevent condensation while another thought it was unnecessary. | DOE views insulating ducts within conditioned space as a good practice for condensation prevention in specific designs and climates. However it recognizes that this practice does not need to be part of the Target Home specifications, as it provides negligible energy savings benefits. | R-4 duct insulation provision has been removed from the Target Home specs. |
| 99 | Target Home Infiltration Rates - Combustion Safety | One commenter expressed concern regarding combustion safety and the target home ACH50 values, and suggested that combustion safety precautions should be used. | By virtue of the ENERGY STAR Homes V3 HVAC System Quality Installation Rater Checklist, furnaces, boilers, and water heaters located within the home's pressure boundary must be mechanically drafted or direct-vented. One exception allows naturally drafted equipment in Climate Zones 1-3; however in this case the Rater must then conduct combustion safety test procedures in accordance with RESNET or BPI protocols (Item 10.1 from the HVAC Rater checklist). Thus, DOE agrees with the commenter's concern and feels that the Challenge Home provisions address it adequately. | No policy change. |
| 100 | Target Home Infiltration Rates - Hot Climates | Commenters expressed a range of views on the 3 ACH50 Target Home tightness spec in CZ 1-2, with equal numbers stating it was too low, reasonable, or too high. | Relative to energy codes, above-code programs like ENERGY STAR for Homes V3, and tightness levels achievable with very good building practices, DOE feels this ACH50 level is reasonable as a target. Actual designs can exceed or fall short of this target, with the corresponding benefits or penalties in reaching the HERS Index Target. | no policy change |
| 101 | Target Home Infiltration Rates - Mixed Climates | Commenters expressed a range of views on the 2.5 ACH50 Target Home tightness spec for CZ3-4, with roughly equal numbers stating it was too low, reasonable, or too high. | Relative to energy codes, above-code programs like ENERGY STAR for Homes V3, and tightness levels achievable with very good building practices, DOE feels this ACH50 level is reasonable as a target. Actual designs can exceed or fall short of this target, with the corresponding benefits or penalties in reaching the HERS Index Target. | No policy change. |

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| 102 | Target Home Infiltration Rates - Cold Climates | Commenters expressed a range of views on the 2.0 ACH50 Target Home tightness spec for CZ5-7, with roughly equal numbers stating it was too low, reasonable, or too high. One respondent stated that the tightness level should be more stringent for larger (4000 SF) homes. | Relative to energy codes, above-code programs like ENERGY STAR for Homes V3, and tightness levels achievable with very good building practices, DOE feels this ACH50 level is reasonable as a target and certainly appropriate for cold climate homes. Actual designs can exceed or fall short of this target, with the corresponding benefits or penalties in reaching the HERS Index Target. As for larger homes, while the Target Home tightness level does not differentiate for home size, homes over the Benchmark Home Size will have to do more to qualify - which could entail a tighter envelope. | No policy change. |
| 103 | Target Home Infiltration Rates - Very Cold Climates | One commenter stated that the Target Home tightness level for CZ8 should be 3 ACH50, while others supported the draft spec of 1.5 ACH50. | Relative to energy codes, above-code programs like ENERGY STAR for Homes V3, and tightness levels achievable with very good building practices, DOE feels this ACH50 level is reasonable as a target and certainly appropriate for very cold climate homes. Actual designs can exceed or fall short of this target, with the corresponding benefits or penalties in reaching the HERS Index Target. | No policy change. |
| 104 | Target Home SHGC - Passive Solar Flexibility | Nearly all comments on the Target Home SHGC values pointed out that the spec should accommodate designs that take advantage of passive solar heating. | DOE fully supports passive solar design in high performance home designs. One item to note is that the Target Home SHGC is not binding or mandatory - it merely defines the house that the design home must meet/exceed. Thus, actual home designs are free to incorporate SHGC values above those listed in Exhibit 2 and use passive solar design to meet/exceed the Target Home HERS Index. DOE felt that the Target Home should not assume a passive solar design approach given that many homes cannot utilize this technique when appropriate. Lastly, in the Mandatory requirement for ENERGY STAR rated fenestration, DOE has also added an exception for fenestration used as part of passive solar design. | DOE has modified or added footnotes to provide full flexibility to utilize passive solar design without constraints or penalties. This modifications are also consistent with ENERGY STAR Homes V3. |
| 105 | Target Home U Values - General | Many respondents were generally supportive of the Target Home U-Values for windows across all climate zones. One respondent suggested a target of U = 0.3 in CZ 1-2. | The Target Home window U-Values are somewhat more stringent than current ENERGY STAR window product criteria, and likely to be very close or equal to the next version of the ENERGY STAR window product criteria (V 6.0). DOE feels that these performance levels are achievable with readily available products at a reasonable cost. The window U-Values in Exhibit 2 are only Target Home specs as well, so builders have flexibility to do more or less. | No policy change. |

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| 106 | Target Home WFA - Prescriptive Compliance | One commenter asked if the window U and SHGC values in Exhibit 2 were required for Performance Path compliance, and if pointed out that these values would limit passive solar design. | DOE agrees with this observation and has added a clarifying footnote which provides exceptions when the U-value and SHGC values in Exhibit 2 are being used for Prescriptive Compliance. | DOE has added a clarifying footnote, for cases when Exhibit 2 is being used for Prescriptive Compliance with the DOE Challenge Home. |
| 107 | Target Home WFA - Clarification of when U/SHGC Adjustments are Applied | One respondent requested more details on how to apply the WFA adjustment factor, either in the table or a footnote. | DOE has clarified that an adjustment to the Target Home window specs due to total window-to-floor area greater than 15% only applies for Prescriptive Path compliance cases. | DOE has added a clarifying footnote. |
| 108 | Target Home WFA - Limiting Window Area undermines Passive Solar | One commenter stated that limiting the WFA ratio to 15% is unnecessary and can be counterproductive as highly efficient windows used as part of a passive solar design can provide significant energy benefits. | DOE has clarified that an adjustment to the Target Home window specs (U, SHGC) due to total window-to-floor area greater than 15% only applies for Prescriptive Path compliance cases. For homes following the Performance Path specification, the design home can use greater than 15% WFA in window area. The design home must simply meet/exceed the Target Home HERS Index. In cases where the design home has >15% WFA of glazing, the Target Home (for purposes of calculating the target HERS Index) is capped at 15% WFA of glazing, evenly distributed on the orientations of the building. | DOE has added a clarifying footnote. |
| 109 | Target Home - ENERGY STAR Water Heater - Support | Several commenters offered general support for the Target Home specification of an ENERGY STAR rated water heater. | DOE feels that setting the target home water heater requirements at ENERGY STAR levels represents a reasonable target for efficiency, while still allowing flexibility through performance calculations and encouraging builders to use higher efficiency water heaters to gain further flexibility. | No Policy Change |

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| 110 | Target Home - ENERGY STAR Water Heater - Use of Tank Systems | On commenter recommended that tank water heaters should only be allow within insulated spaces. | There are incentives within the specifications to use tankless systems, heat pump water heaters, or other high efficiency water heaters. DOE anticipates that many qualifying homes will use these options, but wishes to allow this measure of flexibility on tank location. | No policy change. |
| 111 | Target Home - ENERGY STAR Water Heater - Use of Electric Tank Systems and Use of Standby Losses | One commenter suggested that, in Marine climate zone 4, electric tank water heater in the thermal envelope could be used to reduce space heating loads. | Electric tank water heaters are not disallowed by the DOE Challenge Home. The target home sets efficiency levels higher than a standard electric tank. However, this target home can be met using a variety of approaches and efficiency can be made up elsewhere in the home. In addition, the intent of the DOE Challenge Home is to never stand in the way of innovation. The Challenge Home National Program Requirements specifically allow a rater to submit an alternative approach to DOE along with calculations and/or testing that show equivalency. | No policy change. |
| 112 | Target Home - ENERGY STAR Water Heater - Limits on Use of Electric Tank Systems | On commenter recommended that the spec should encourage the use Heat Pump water heaters with greater than 2.0 EF, Tankless EF >0.93 and gas-fired >0.62 EF. Electric water heaters should be avoided unless used as storage for Geothermal Systems. | Essentially, with minor changes, this is what the specifications accomplish. The DOE Challenge Home target home sets the specs at ENERGY STAR efficiency levels. This does not mean that the system has to be ENERGY STAR, but that the target home is defined by those efficiencies and any change from that will impact your performance calculations (either positively or negatively). DOE Challenge Home decided to use ENERGY STAR requirements rather than specific EFs so that as ENERGY STAR updates the program will automatically capture those changes. | No Policy Change. |
| 113 | Target Home - ENERGY STAR Water Heater - Limits on Natural Draft Systems | On commenter suggested eliminating any natural draft or power draft but using direct vent only. | The Indoor airPLUS provisions require that any water heater located in conditioned space must be power vented or direct vented. These provisions (Item 5.1) also specify what types of spaces are considered as "conditioned space" for this requirement. DOE feels that this provision, which prohibits atmospherically vented water heaters from being located in conditioned space, is reasonable. | No policy change. |

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| 115 | Target Home Programmable T-Stat - Support | Multiple commenters provided general supportive comments on the programmable thermostat spec for the Target Home. | DOE sees programmable thermostats as a widely available technology with energy saving potential in most applications. Placing the requirement in the target home spec allows flexibility for unique situations | No Policy Change |
| 116 | Target Home Programmable T-Stat - Applicability and Effectiveness | Multiple commenters noted situations in which programmable thermostats may not provide additional savings: passive design, ductless heat pumps, and low load situations in which the thermal envelope is adequately controlling indoor temperature. | The programmable thermostat requirement is defined only for the Target Home. Builders have the flexibility to use a different kind of thermostat, making up for any energy performance shortfall elsewhere. | No Policy Change |
| 117 | Target Home Appliances - Defining Efficiency Levels | One commenter suggested that appliance efficiency levels be specifically defined, as ENERGY STAR appliances can incorporate a wide range of efficiency levels. | DOE agrees. In the DOE Challenge Home HERS Index Target Procedure for National Program Requirements (to be released in April 2012), these levels will be specifically defined. DOE anticipates that these levels will coincide with the appliance efficiency levels specified in ENERGY STAR for Homes V3. | DOE will address specific appliance efficiency levels in the DOE Challenge Home HERS Index Target Procedure for National Program Requirements (to be released April 2012). |
| 118 | Target Home Appliances - Support | Several respondents support ENERGY STAR level of performance in the Target Home for dishwashers, refrigerators, bathroom ventilation fans, and ceiling fans. | DOE recognizes the value of ENERGY STAR certified appliances in meeting the performance goals of DOE Challenge Homes. Such appliance upgrades are also typically cost-effective. | No policy change |
| 119 | Target Home Appliances - Projects without Appliances | One respondent noted that some spec homes or affordable homes may not include all of the ENERGY STAR appliances listed in the Target Home definition. | The Target Home is modeled assuming the use of an ENERGY STAR dishwasher (0.66 EF) and refrigerator (423 kWh/year). If the design home does not utilize one of these appliances, it is not "penalized". Qualifying DOE Challenge Homes are not required to install ENERGY STAR dishwashers, refrigerators, or washing machines if the design does not call for inclusion of these appliances. | No policy change. |

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| 120 | Utility Billing Data Requests - Support | Many commenters supported the concept of requesting utility bill data from the buyers of DOE Challenge Homes. They commented that this is common practice for some, and the request can work best as part of the closing documents. A few suggested that the use of this data should be helpful but done carefully. One commenter felt that few owners would agree to this, citing experience with LEED projects | DOE views actual utility billing data as excellent evidence to promote DOE Challenge Home partners in their local markets and through the national program. DOE is currently working on the format of how billing data could be requested, collected, stored, and used with respect to privacy issues. | No policy change at this time. |
| 121 | Uses of Max Energy Use Metric instead of HERS Index | One commenter stated that basing the DOE Challenge Home (Builders Challenge) qualification framework on a HERS Index is not a good approach due to concerns about the HERS rating methodology. Instead, a maximum house energy score should be used, which would also open up the use of more software options. | DOE is deferring to the ongoing efforts of the energy rating industry for the tools and processes used for ratings and verification. Further, DOE feels that the Target Home HERS Index framework used in both ENERGY STAR for Homes V3 and DOE Challenge Home helps establish house-specific HERS targets and avoids some potential issues which can arise in using the HERS Index for a national home labeling program. | No policy change. |
| 122 | Resources for Partners - Design Assistance | When asked about tools which partners could use, one respondent stated that he needed design assistance on passive ventilation, and didn't need a "stamp of approval" from the program. The commenter felt that the R-5 window program was worthwhile to shift the marketplace. | DOE does not provide direct design assistance to builders within this program. However, builders interested in leading edge research can inquire about participating in DOE's Building America research program. Please visit www.buildingamerica.gov and then review the different research teams. | No policy change. |

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| 123 | Resources for Partners - Marketing Resources | Multiple respondents emphasized the importance of marketing the DOE Challenge Home (formerly Builders Challenge) to raise builder and consumer awareness. One respondent also suggested numerous marketing resources to assist DOE Challenge Home partners, local seminars instead of webinars, Social Media outreach, and visibility on housing-related TV shows. | DOE agrees that marketing support is very effective. DOE is working on a suite of marketing solutions and messaging for the industry that it feels will be very effective. | No policy change. |
| 124 | Resources for Partners - Lack of Consumer Demand | Multiple commenters stated that builders will likely not participate in the DOE Challenge Home program, due to a struggling housing industry and a lack of consumer demand. | DOE has seen successful high performance builders drive innovation in their market, and thereby initiate a demand for leading edge homes. This is the model for DOE Challenge Home, where builders will innovate and drive the market for this innovation, and gain multiple production, performance, and marketing benefits by doing so. | No policy change. |
| 125 | Resources for Partners - Leveraging Builder Partners | One commenter suggested that DOE should leverage and learn from the leading edge builders in the program. | DOE strongly agrees that the experience and successes of builder partners are a tremendous resource, and plans to engage partners through case studies, awards recognition, and similar efforts in 2012 and beyond. | No policy change. |
| 126 | General Comments - Flexibility in Meeting Requirements | One respondent reiterated that builders should be given maximum flexibility in meeting the energy goals of DOE Challenge Home. | DOE is using this public comment period to identify and address areas where more flexibility is needed or alternatives should be recognized (e.g. ducts in conditioned space). Note that all Exhibit 2 provisions merely define the Target Home - they are not mandatory provisions. Also note that Footnote 1 of the program requirements also provides the Rater flexibility in evaluating if alternative methods still meet the intent of a provision. | No specific policy change in relation to this comment, although other policy changes generally address the topic of flexibility |

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| 127 | Partner Resources - Resources Proving Value | One respondent stated that consumer-oriented materials which allow a builder to easily communicate the value of different components of a DOE Challenge Home - such as the envelope - would be helpful in proving the value. | DOE is currently developing a consumer marketing brochure which builders can customize and use for consumer marketing. | No policy change. |
| 128 | Timeline - New Specification Phase-In | Regarding the phase-in of Version 2 specs, multiple respondents felt that the timeline was clear and acceptable. One or two stated that they would likely complete homes under the current V1 spec but not continue with the V2 spec. | DOE is working to accomplish the transition timeline so that the DOE Challenge Home is consistent with ENERGY STAR for Homes V3 as complimentary federal programs. DOE understands the Challenge Home spec will be challenging for builder partners as it represents leading-edge building practices throughout the home, but will support builder partners with technical, marketing, and program support. | No policy change. |
| 129 | Timeline - Completion Date for Use of Existing (Builders Challenge) Specification | One respondent proposed that a completion date should not be part of the V2 phase-in. | In the interest of program clarity, DOE wants to minimize the time window during which V1 and V2 projects are being certified. Therefore a "completed by" date is necessary to establish a cut-off point for use of the V1 specs. There is currently no limit on when projects qualified under V2 must be completed. | No policy change. |

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| 130 | Timeline - Phase-In for Affordable Housing Projects | One respondent requested a longer transition timeline for affordable housing projects, in keeping with the approach in ENERGY STAR for Homes V3. | DOE recognizes that the transition timing for the DOE Challenge Home is somewhat condensed, but feels strongly that the spec must be updated as closely as possible with the ENERGY STAR Homes V3 program updates. Otherwise, there will be inconsistent and uneven federal home energy labeling programs in the market place. Further, because affordable housing projects already in the pipeline are very likely not required to comply with DOE Challenge Home, DOE is electing to make the transition timeline uniform for all projects. | No policy change. |
| 131 | Footnote Comments - Organization of Program Requirements | Regarding the footnotes, one respondent suggested that footnotes that applied to all provisions should be elevated and not left as footnotes. Footnotes with more detailed information should also be considered for inclusion in the program requirements section. | DOE has used the footnote format to link the details on understanding and implementing a specific provision to the provision itself, which is often stated in a bullet or a table to keep the top level program requirements more concise. This makes the core requirements more easily reviewed, and avoids adding many details to the tables which will not apply to all projects. | DOE has re-ordered text throughout the program requirements, and sought to condense information as possible. |
| 132 | Footnote Comments - Defaulting to Local Energy Code Requirements | Several respondents supported that local minimum requirements should serve as the Target Home specifications in cases where the local requirements exceed the Exhibit 2 requirements. | DOE agrees with this approach, and will develop customized solutions for markets with more rigorous codes. | No immediate policy change. DOE will provide state-specific guidance for states with more stringent energy codes. |

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| 133 | Footnote Comments - Allowable Contribution of Renewables | One respondent questioned the footnote that restricts the use of renewable systems in meeting the Target Home HERS Index, stating that DOE should allow cost effectiveness in the marketplace determine the technologies which will be used. | The DOE Challenge Home design seeks to emphasize efficiency measures with long-term implications (e.g. life of the building), such as forced-air duct location and hot water distribution. Therefore, renewables are not intended to be traded-off against 100-year building enclosure energy improvements. However, builders can use renewables to help make up ground on the Target HERS Index for homes greater than the Benchmark Home size, and they can also use the HERS Index does (which reflects the use of renewables) for marketing. | No policy change. |
| 134 | Footnote Comments - Vapor Retarder Provisions | Regarding the footnote requiring compliance with the 2009 IRC vapor retarder provisions for building assemblies, several commenters support this item, while a few others recommend instead referencing the 2012 IRC for consistency or allowing compliance with either the 2009 or 2012 IRC. | DOE agrees that for the sake of consistency (the program has multiple references to 2012 IECC), because 2012 IRC is beginning to see state-level adoption, and because the 2012 IRC is the most current model code guidance, that this footnote will reference the 2012 IRC instead of the 2009 IRC. | Vapor retarder provisions in footnote will reference 2012 IRC, instead of 2009 IRC. |
| 135 | Footnote Comments - Duct Leakage Testing | Several respondents supported the footnote guidance on duct leakage testing, while one commenter asked for clarification on a "DOE-approved verifier" and suggested that this designation be defined in the program requirements. | DOE has clarified the footnote on duct leakage testing to be consistent with the provisions in ENERGY STAR for Homes V3 (Rev5) for consistency, and also added a verifier definition to the National Program Requirements. | Revised duct leakage testing footnote to be consistent with ENERGY STAR for Homes V3, and added a definition of verifier to the National Program Requirements. |
| 136 | Footnote Comments - Duct Leakage Testing & IECC Protocol | One commenter suggested referencing the duct leakage test protocols in the 2012 IECC. | While the 2012 IECC has a logical duct testing protocol, DOE elects to reference RESNET-approved testing protocols to maintain consistency with ENERGY STAR for Homes V3. | No policy change. |

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| 137 | Footnote Comment - Solar Radiation Map Referenced in RERH Applicability | One commenter noted some wording and formatting concerns with the NREL solar radiation map which is referenced in the footnote on the Renewable Ready checklists. | DOE agrees with the editorial concerns, and will alert NREL to these issues. | No policy change. |
| 138 | Footnote Comment - Referencing 2012 IECC Climate Zones | One commenter suggested referencing the 2012 IECC Climate Zones instead of 2009 IECC for consistency in the IECC references. The zones did not change between these 2 versions of the IECC. | DOE agrees with this suggestion to make IECC references consistent within the DOE Challenge Home program requirements. | 2009 IECC Climate Zone references changed to 2012 Climate Zone references in National Program Requirements |
| 139 | Footnote Comments - Use of HPWH Units as Part of WH Mech Ventilation | Regarding the footnote on using heat pump water heaters as a component of whole-house ventilation in cold climates, multiple respondents asked for a better explanation of this design approach while two others challenged that it would be suitable for cold climates or commercially available. One proposed deleting the footnote. | To make the DOE Challenge Home National Program Requirements as concise as possible, DOE agrees that this footnote can be deleted. | Footnote on the use of heat pump water heaters as part of a whole-house mechanical ventilation system has been deleted. |

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| 140 | Footnote Comment - Allowable Methods for Complying with 2012 IECC Insulation Levels | Multiple commenters support the footnote on allowable methods for meeting envelope insulation requirements, while one respondent inquired about how a basement ceiling insulation job (with ducts and plumbing) could meet RESNET Grade 1. | DOE has adopted the same methods for meeting envelope insulation levels as are used in ENERGY STAR for Homes V3, which provide flexibility and some trade-offs. Regarding a Grade I basement ceiling insulation job, the feasibility of such an installation would depend on the extent of mechanical components in the ceiling assembly and the type of insulation used. A common alternative would be insulating the foundation walls instead. | DOE has aligned envelope insulation compliance methods with ENERGY STAR for Homes V3 pathways. |
| 141 | Footnote Comment - Infiltration Testing Methods | Multiple commenters support the footnote on air infiltration testing and test methods, while one respondent felt that SIPS homes should be exempt from this requirement. | DOE feels that no technology type should be exempt from air infiltration testing. | No Policy Change |
| 142 | Footnote Comment - Explanation of Window Area Exception | One commenter asked for clarification on the footnote which exempts up to 0.75% of conditioned floor area of window area from the Climate Choice requirements. | There is no longer a reference to "Climate Choice" and the 0.75% factor has been replaced with a flat 15 sq ft exception from inclusion in U and SHGC requirements. See the footnotes connected to the ENERGY STAR fenestration Mandatory requirement for full details. | The trade-offs and allowances on the requirement for ENERGY STAR fenestration have been clarified and simplified. |

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| <p>143</p> | <p>Footnote Comment - R-5 Windows</p> | <p>Multiple commenters supported the recommendation on R-5 windows, with several pointing out that this recommendation should be directed for Cold Climates where these windows will be most impactful. One respondent suggested omitting the R-5 window footnote as it is a recommendation, not a requirement.</p> | <p>DOE agrees that the R-5 window recommendation should be directed for Cold Climates and has re-worded the footnote accordingly. Because DOE strongly supports and is involved in advanced window technology development, it has elected to highlight the window technology in the spec.</p> | <p>Moved footnote to more appropriate location within the Target Home specifications table.</p> |
| <p>144</p> | <p>Footnote Comment - Adaptive Recovery for Programmable T-Stats</p> | <p>There were two supportive comments in the footnote calling for Adaptive Recovery in programmable thermostats used with heat pumps, with an additional question as to whether mini-split systems would have this feature.</p> | <p>This requirement comes directly from ENERGY STAR V3. Furthermore, it is in the Target Home spec, which is flexible, if a specific innovative technology does not use it. Mini splits use of back-up heat and controls varies.</p> | <p>No Policy Change</p> |