

EPA Responses to ENERGY STAR 2011 Qualified New Homes Comments

EPA previously posted a compilation on its Web site of all comments received during the first comment period for its proposed 2011 ENERGY STAR Qualified New Homes guidelines, which ended July 10, 2009

This document contains a summary of these comments, along with EPA's response to each point raised and the resulting policy change, if any.

When similar comments were received from multiple respondents, EPA has consolidated these ideas into a single summary bullet. However, EPA has attempted to retain all unique comments received, including those submitted by a single respondent.

*The Environmental Protection Agency
is not responsible for any typographical errors or omissions.*

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Costs

ID	Comment Summary	EPA's Response	EPA's Policy Decision
General			
1	<ul style="list-style-type: none"> Some respondents suggested that EPA help defray the costs by aligning the requirements with a builder tax credit and/or with future renewals of the 2005 Energy Efficient home tax credit. Other respondents preferred tax credits and stimulus funds not be tied directly to the ENERGY STAR program. 	<ul style="list-style-type: none"> Tax credits and utility rebates are often not aligned with EPA's strategic goals for ENERGY STAR Qualified Homes. EPA's guidelines are the result of a deliberative process to ensure a cost-effective and comprehensive whole-house approach that offers meaningful savings and is grounded in building science principles. Moreover, even where EPA's requirements don't exactly align with various tax credit and rebate programs, they often happen to result in partial or full compliance, thereby allowing costs to be defrayed. 	<ul style="list-style-type: none"> No policy change.
2	<ul style="list-style-type: none"> Respondents expressed specific concerns that builders, especially production builders, who build entry-level, move-up, or retirement homes, would experience a decrease in participation among market actors. Respondents explained that these homes are typically smaller and compete on price and that prices have been driven down in the current market. 	<ul style="list-style-type: none"> EPA is willing to accept some drop in initial builder participation to ensure a cost-effective and comprehensive whole-house approach that offers meaningful savings and is grounded in building science principles. EPA believes that these guidelines will offer builders a much more competitive product relative to new homes that are minimally code-compliant and to existing homes through increased customer satisfaction, reduced risk, and substantially reduced energy consumption and related greenhouse gas emissions. Ultimately, by committing to guidelines that emphasize added value over first costs, EPA believes long-term builder participation will increase. 	<ul style="list-style-type: none"> No policy change.
3	<ul style="list-style-type: none"> Respondents expressed concern that affordable housing developers would also experience a decrease in participation among market actors. This is because they operate on extremely limited budgets, yet serve the population that most benefits from improved energy efficiency, durability, and IAQ. One respondent noted that the average affordable home cost is \$75k-100k, so a cost increase of 5-8% cannot be justified. 	<ul style="list-style-type: none"> While it's true that affordable housing developers are challenged with maximizing units while minimizing costs, affordable housing is the sector of new home construction where ENERGY STAR offers the best value. Occupants pay up to seven times more of their income for energy expenses and can least afford higher maintenance costs with lower quality construction. In addition, increased efficiency reduces operational costs of multifamily buildings, which can increase profits and help secure financing. Lastly, competitive funding sources (e.g., low income housing tax credit programs, HUD grant program) are increasingly incorporating stringent energy efficiency requirements into their criteria. Therefore, EPA believes that long-term participation of affordable housing developers will not 	<ul style="list-style-type: none"> No policy change.

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		decrease because the proposed guidelines will continue to deliver maximum value for affordable housing with extremely reasonable costs.	
4	<ul style="list-style-type: none"> NAHB noted that 246k U.S. households are priced out of the market when the cost of a median-priced new home is increased by just \$1k. Thus, a price increase of \$5k would potentially price out many homebuyers from purchasing an ENERGY STAR qualified home. It is not clear whether this impact accounts for the benefit of reduced utility bills, however. 	<ul style="list-style-type: none"> With due respect to NAHB research, EPA will continue to promulgate guidelines that may increase first costs if they offer American home buyers increased value and affordability. EPA experience suggests that even where some cost increases are necessary, energy efficient mortgages can be used to ensure no additional income or down-payment are needed to purchase qualified homes, which increase affordability by fully offsetting monthly mortgage increases with monthly utility savings. 	<ul style="list-style-type: none"> No policy change.
5	<ul style="list-style-type: none"> Respondents noted that utility program sponsors also may be impacted. These entities rely on high participation rates to achieve program goals and will therefore be impacted even if the decrease is temporary. 	<ul style="list-style-type: none"> EPA's analysis of proposed guidelines suggests that utility partners would benefit from meaningful energy savings and, in hot and mixed climates, meaningful peak demand reduction. Furthermore, the level of efficiency promoted by the program necessitates accompanying water management and air quality measures to mitigate potential problems associated with tight-construction and well-insulated construction practices. EPA believes this combination of meaningful savings and risk reduction will strengthen long-term program participation even if there is an initial drop in participation. 	<ul style="list-style-type: none"> No policy change.
Increased Construction Costs			
6	<ul style="list-style-type: none"> Respondents believe that EPA's estimate of increased cost is too conservative; respondents' estimates generally ranged \$6-8k, and as high as \$14.5k. Respondents felt that EPA's estimated incremental cost was conservative in part due to a lack of accounting for the increased level of effort by builder staff and management, especially during the initial phase-in of the guidelines, and increased fees charged by trades for premium services. Specifically, this was noted for the HVAC design engineer, field technician, and drywall installer, who may take responsibility for sealing the top-plate. 	<ul style="list-style-type: none"> Based on extensive discussion with builders, raters, and building science experts across the country during the vetting process, EPA is confident that the estimates detailed in its Savings & Cost Estimate Summary, available on EPA's Web site, are conservative and that substantial decreases in costs will rapidly occur as partners gain experience with the new requirements. EPA received similar concerns during the development of the 2006 guidelines, with many respondents over-estimating the cost of the Thermal Bypass Checklist (e.g., some estimated the cost as high as \$7,000 compared to actual costs often about \$250). 	<ul style="list-style-type: none"> No policy change.
7	<ul style="list-style-type: none"> Many respondents requested that EPA make fewer measures mandatory, especially with regard to lighting, appliances, and the new checklists, to allow Partners to determine the most cost-effective measures for their 	<ul style="list-style-type: none"> Upon review of the proposed guidelines, EPA agrees that some of the mandatory requirements that were originally proposed can be removed, where their removal does not compromise the integrity of the brand. EPA intends to promote guidelines that ensure meaningful 	<ul style="list-style-type: none"> EPA has eliminated mandatory requirements for lighting, appliances, ceiling fans, R-8 duct insulation, and efficient hot water distribution measures. The

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	businesses.	energy savings, a complete thermal enclosure system, a quality-installed HVAC system, and a water management system for all qualified homes.	efficient hot water distribution measures have been removed from this iteration of the guidelines altogether. The other items will be maintained in the prescriptive path and within the ENERGY STAR Reference Design to influence their use in labeled homes.
8	<ul style="list-style-type: none"> • The Quality Framing Checklist, in particular the requirement for a raised-heel truss, was the source of the most common cost-related concerns: <ul style="list-style-type: none"> ○ One respondent noted that the cost of trusses, wall sheathing, house wrap, and siding would add \$2k to construction costs, and others shared similar concerns. ○ Two respondents cited the cost of redesigning their homes as additional costs. ○ Several respondents noted that the energy savings realized by the raised heel truss do not justify the increased cost. ○ Respondents believed that a raised heel truss would add undue cost to small homes intended for 1st-time or move-up market homebuyers and recommended an exception on homes that are a certain percentage below the benchmark conditioned floor area. 	<ul style="list-style-type: none"> • After nine months of talking to builders, raters, and building science experts across the country, EPA received substantial input confirming that the use of a raised-heel truss or equivalent framing technique that allows for full-depth or near full-depth insulation is both cost-effective and a critical detail for ensuring a complete thermal enclosure system. It appears that the many builders already implementing raised-heel trusses are finding the costs to be much lower than those raised in the respondents' concerns. Further, extensive infrared images of homes across the country consistently show major thermal bypasses due to compressed insulation at attic eaves. 	<ul style="list-style-type: none"> • No policy change, though EPA has clarified within the proposed guidelines that alternative framing techniques that achieve the same objective as a raised-heel truss may be also be used to meet this requirement.
9	<ul style="list-style-type: none"> • Respondents expressed concern that compliance options in the Quality Framing Checklist for walls are not cost-effective given the energy that would be saved, particularly for the OVE option. 	<ul style="list-style-type: none"> • EPA believes that reducing thermal bridging is a critical detail to ensuring that qualified homes consistently deliver a complete thermal enclosure system. In addition, the OVE requirements often reduce labor and material costs, and should result in reduced overall costs for many partners. Finally, extensive field observations by EPA have confirmed that reduced framing techniques are being cost-effectively implemented by numerous builders across the country. 	<ul style="list-style-type: none"> • No policy change.
10	<ul style="list-style-type: none"> • Another concern expressed by respondents 	<ul style="list-style-type: none"> • EPA agrees that non-conformance can be expensive to 	<ul style="list-style-type: none"> • No policy change regarding the

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	<p>relating to the Quality Framing Checklist is that correcting framing problems at the point of inspection would be cost prohibitive, and thereby eliminate the possibility of qualification.</p>	<p>correct at the time of inspection. However, it notes that this is not a new phenomenon – many requirements of the current guidelines, such as infiltration level and duct leakage, embody this risk, as well. Therefore, this indicates the need for raters and builders to communicate early and clearly about the new requirements and expectations for compliance. EPA will assist in this matter by providing ample time to integrate the new checklist requirements into the workflow of partners.</p>	<p>thermal bridging requirements; however, EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. These checklist sections are similar to the requirements in the current Thermal Bypass Checklist. Effectively, this plan allows partners a full two years to educate and train partners and allow them to integrate the new mandatory checklists into their workflows prior to full implementation.</p>
11	<ul style="list-style-type: none"> Respondents expressed concerns regarding the Water Management Construction checklist given the lack of associated energy savings. 	<ul style="list-style-type: none"> EPA recognizes that the Water Managed Construction Checklist, which has been renamed to the Water Management System Checklist, does not contribute to energy savings, but considers it inextricably linked to the other thermal enclosure system requirements that contribute to the meaningful energy savings. Specifically, the requirements for reduced infiltration, continuous air barriers, and quality-installed insulation substantially reduce the tolerance of the home to handle unintended water flows. 	<ul style="list-style-type: none"> No policy change.
12	<ul style="list-style-type: none"> Respondents expressed concerns regarding the Indoor Air Quality checklist given the lack of associated energy savings. 	<ul style="list-style-type: none"> EPA recognizes that the Indoor Air Quality Checklist does not contribute directly to energy savings. However, the requirements are inextricably linked to the reduced infiltration requirements, which contribute to the meaningful energy savings. Specifically, adequate 	<ul style="list-style-type: none"> No policy change.

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		exchange of outdoor air cannot be achieved with the level of infiltration promoted in the guidelines; therefore, a ventilation system must be included. Coincidentally, RESNET guidelines only recognize the benefits of infiltration that is reduced below 0.35 ACH when ventilation systems are included.	
13	<ul style="list-style-type: none"> Multiple respondents requested that EPA delay the implementation of the efficient hot water distribution systems until additional research can demonstrate the savings are justified by the incremental cost. 	<ul style="list-style-type: none"> Upon review of the proposed guidelines, EPA agrees that meaningful energy savings can be achieved for this iteration of the guidelines without requiring low-flow showerheads and efficient hot water distribution systems. In addition, EPA feels that it is appropriate to exclude these requirements until uniform standards can be developed. 	<ul style="list-style-type: none"> EPA has eliminated the requirements for low-flow showerheads and efficient hot water distribution systems from the proposed guidelines.
14	<ul style="list-style-type: none"> Regarding space heating equipment, one respondent requested that EPA lower the required furnace efficiency to 90% in cold climates, stating that the incremental costs to purchase 92% AFUE equipment was not justified by the incremental savings. 	<ul style="list-style-type: none"> EPA intended to align with the requirements of the ENERGY STAR qualified furnace program, which performs extensive cost-effectiveness studies when setting criteria. The current guidelines do, in fact, require an efficiency of 90% AFUE for gas furnaces, rather than 92% AFUE, which was originally proposed in the new homes guidelines. 	<ul style="list-style-type: none"> EPA has reduced the gas furnace efficiency in the prescriptive path and ENERGY STAR Reference Design to 90% AFUE.
15	<ul style="list-style-type: none"> Regarding space cooling equipment, one respondent noted that for homes with central AC and a gas furnace, the requirement for a high-efficiency fan motor, which is generally necessary to obtain a high SEER rating, may require the use of a high-efficiency furnace. That is to say, the least-cost minimum efficiency furnaces that are allowed for use in hot climates may not be available with the required high efficiency fan motor. 	<ul style="list-style-type: none"> It is EPA's understanding that high-efficiency fan motors, which are often a component of high-efficiency AC units, can be specified without the need to use a high-efficiency furnace. Therefore, the concern raised by the respondent should not materialize. 	<ul style="list-style-type: none"> No policy change.
16	<ul style="list-style-type: none"> Regarding duct insulation, multiple respondents questioned the value of increasing the duct insulation to R-8, stating that the increase in cost from R-6 is not warranted given the small savings, which will be minimized by the addition of a radiant barrier in hot climates. A study by Lawrence Berkeley National Laboratory was referenced, which demonstrated savings of 1% in hot climates. 	<ul style="list-style-type: none"> EPA agrees with respondents that insulation levels below R-8 can be used by partners without compromising its goals for meaningful savings, a complete thermal enclosure system, adequate ventilation and quality-installed HVAC systems, and water management systems for all qualified homes. However, it does note that the 2009 IECC, which many states are pursuing adoption of, requires R-8 insulation for supply ducts in the attic and R-6 insulation for all other ducts. 	<ul style="list-style-type: none"> EPA has removed the mandatory requirement for R-8 duct insulation in attics. It has also aligned the requirements for duct insulation in the prescriptive path and the ENERGY STAR Reference Design with the 2009 IECC requirements.
17	<ul style="list-style-type: none"> Regarding lighting, one respondent noted that the cost of compliance was too high given the impermanence of the efficient 	<ul style="list-style-type: none"> EPA believes that lighting is one way to achieve very cost-effective and significant energy savings within a home and is therefore an important component to 	<ul style="list-style-type: none"> EPA will continue to include efficient lighting in the proposed guidelines. However, it will

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	lighting.	promote within the guidelines. However, EPA agrees with respondents that other upgrade measures can be used without compromising EPA's overall goals for the program.	remove it as a mandatory requirement for all qualified homes and instead only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.
18	<ul style="list-style-type: none"> Multiple respondents expressed concern that the added costs for ceiling fans, exhaust fans, and low-flow showerheads are not justified by the relatively small savings achieved. 	<ul style="list-style-type: none"> Upon review of the proposed guidelines, EPA agrees that some of the mandatory requirements that were originally proposed can be removed, where their removal does not compromise the integrity of the brand. EPA intends to promote guidelines that ensure meaningful energy savings, a complete thermal enclosure system, adequate ventilation and quality-installed HVAC systems, and a water management system for all qualified homes. Of the items addressed by the respondent, only the exhaust fan requirements must be maintained. Experts have suggested to EPA that exhaust fans won't be used as part of an effective HVAC system unless they are quiet, which is partially a by-product of high levels of efficiency. 	<ul style="list-style-type: none"> EPA has eliminated mandatory requirements for lighting, appliances, ceiling fans, R-8 duct insulation, and efficient hot water distribution measures. The exhaust fan requirements will be maintained as a mandatory requirement for full-baths only. The efficient hot water distribution measures have been removed from this iteration of the guidelines altogether. The other items will be maintained in the prescriptive path and within the ENERGY STAR Reference Design to influence their use in labeled homes.
Increased Verification Costs			
19	<ul style="list-style-type: none"> Multiple respondents noted concerns about increased costs for the raters, mainly focusing on verification costs, both for verifying compliance with the requirements within the new checklists and because many felt that additional site visits would be required. Multiple respondents proposed that EPA ensure that all verification can be accomplished with two site visits, at rough framing and final inspection, using additional allowances for rater-approved builder verification as needed. To clarify the verification process, CEE proposed that EPA prepare a matrix that illustrates which requirements must be 	<ul style="list-style-type: none"> EPA has field tested the checklists and finds they can be fully implemented on an average size home in approximately two extra hours. This should result in very reasonable costs for the additional quality assurance provided. Moreover, while stakeholder confusion was evident in the feedback received, EPA's intention has been to not require any additional field visits beyond the typical framing and final inspections, in part through the use of adequate allowances for builder-verified items. 	<ul style="list-style-type: none"> EPA has split the Water-Managed Construction checklist that was originally proposed into two new checklists – one Water Management System checklist for builders and one for raters. Builders will be responsible for verifying all of the items on the builder checklist and two additional allowances have been provided on the rater checklist for further flexibility. In addition, EPA has eliminated the stand-alone Quality Framing checklist and current Thermal Bypass Checklist and, instead,

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	<p>verified by the builder, verified by the rater, and verified by the builder at the discretion of the rater.</p>		<p>relocated the requirements to a new Thermal Enclosure System Rater checklist and increased the total allowances for builder-verified items to eight.</p> <ul style="list-style-type: none"> • These two changes should address the majority of respondents' concerns about the need for more than two site visits.
20	<ul style="list-style-type: none"> • To further mitigate the impact on affordable housing, some respondents recommended developing reduced verification requirements that utilize a licensed professional architect or engineer to act as third-party verifiers. • Alternatively, respondents requested that EPA develop a means for towns, municipalities, utilities, or non-profit organizations with funding to act as sponsors, helping to offset costs. 	<ul style="list-style-type: none"> • EPA appreciates the stakeholder interest in and need for developing a streamlined set of verification requirements for affordable housing, including the possibility of utilizing A/E firms as a third-party verifier. In addition, EPA has encouraged sponsor partners to provide resources to help offset verification costs in affordable housing developments. 	<ul style="list-style-type: none"> • No policy change at this time. However, EPA will continue to consider whether streamlined verification protocols should be developed for affordable housing developers.
21	<ul style="list-style-type: none"> • Other general concerns noted by respondents regarding increased verification costs included: <ul style="list-style-type: none"> ○ The cost of increased training of raters, builders, and trades, ○ Administrative costs to track the calculation of the ENERGY STAR HERS index target and compliance with the checklists, ○ The cost to rework marketing collateral, presentations, and websites. 	<ul style="list-style-type: none"> • EPA agrees that raters, builders, and trades will need significant additional training. • EPA believes that long-term administrative costs will not substantially increase given that the number of site visits will not increase for most homes and especially if software vendors automate the calculation of the ENERGY STAR HERS index target. • Lastly, EPA considers the cost to rework marketing and other materials a short-term cost increase that is inevitable for any program that must continue to evolve to maintain relevance. 	<ul style="list-style-type: none"> • No policy change, though EPA intends to help defray costs by providing extensive training resources to partners, including field guides, webinars, and regional training classes; and by developing and providing new marketing materials for partners.
22	<ul style="list-style-type: none"> • With the currently proposed guidelines, many raters estimated that their cost to the builder will double or triple, adding \$200 to \$1000, with predictions of a total cost ranging from \$1200 to \$1500. • However, one respondent noted that even an additional \$1,200 would represent only ~0.5% of the total cost of a new home and that utility savings would result in a payback of two years or less. 	<ul style="list-style-type: none"> • EPA has field tested the checklists and finds they can be fully implemented on an average size home in approximately two extra hours. This should result in very reasonable costs for the additional quality assurance provided. Moreover, while stakeholder confusion was evident in the feedback received, EPA's intention has been to not require any additional field visits beyond the typical framing and final inspections, in part by providing adequate allowances for builder-verified items. 	<ul style="list-style-type: none"> • EPA has split the Water-Managed Construction checklist that was originally proposed into two new checklists – one Water Management System checklist for builders and one for raters. Builders will be responsible for verifying all of the items on the builder checklist and two additional allowances have been provided on the rater checklist for further flexibility.

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			<ul style="list-style-type: none"> • In addition, EPA has eliminated the stand-alone Quality Framing checklist and current Thermal Bypass Checklist and, instead, relocated the requirements to a new Thermal Enclosure System Rater checklist and increased the total allowances for builder-verified items to eight. • These two changes should address the majority of respondents' concerns about the need for more than two site visits.
23	<ul style="list-style-type: none"> • Multiple respondents felt that an additional visit would be required for the Quality Framing checklist, because inspection would have to occur after framing but before insulation installation, to allow time for any corrections. 	<ul style="list-style-type: none"> • EPA believes that non-conformance can be expensive to correct at the time of inspection, regardless of whether the inspection is completed before or after insulation has been installed. However, it notes that this is not a new phenomenon – many requirements of the current guidelines, such as infiltration level and duct leakage, embody this risk, as well. Therefore, this indicates the need for raters and builders to communicate early and clearly about the new requirements and expectations for compliance. EPA will assist in this matter by providing ample time to integrate the new checklist requirements into the workflow of partners. 	<ul style="list-style-type: none"> • No policy change regarding the thermal bridging requirements; however, EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. These checklist sections are similar to the requirements in the current Thermal Bypass Checklist. Effectively, this plan allows partners a full two years to educate and train partners and allow them to integrate the new mandatory checklists into their workflows prior to full implementation.
24	<ul style="list-style-type: none"> • Many respondents also felt the Water- 	<ul style="list-style-type: none"> • EPA agrees with respondents that a substantial number 	<ul style="list-style-type: none"> • EPA has split the Water-Managed

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	<p>Managed Construction checklist would require additional site visits, even with the allowance for three builder-verified items. They pointed to final grading, capillary breaks, below grade water proofing, drain tile, and roof flashing as steps that can take place at different times. Some estimated that this checklist alone would require 4-6 visits to properly verify.</p> <ul style="list-style-type: none"> Because of these concerns many respondents requested that EPA increase the allowance for builder verification or have the entire checklist be builder-verified. 	<p>of items will need to be builder-verified to ensure that additional field visits beyond the typical framing and final inspections will not be required.</p>	<p>Construction checklist that was originally proposed into two new checklists – one Water Management System checklist for builders and one for raters. Builders will be responsible for verifying all of the items on the builder checklist and two additional allowances have been provided on the rater checklist for further flexibility.</p>
25	<ul style="list-style-type: none"> Multiple respondents felt that the verification cost of \$50 for the HVAC Quality Installation checklist was underestimated by EPA, due to the added time for inspection of ducts and pressure-balancing measures, evaluation of the HVAC contractor checklist including possible evaluation of Manual J loads, and the need to communicate frequently with both the HVAC engineer and installer. 	<ul style="list-style-type: none"> While EPA believes that its assumption of a \$50 incremental cost may be slightly conservative for some raters, the deviation is not so large as to greatly impact the overall cost-effectiveness of the proposed guidelines. Also note that it is not EPA's intention that raters will need to evaluate the Manual J loads provided by the contractor to qualify the home. 	<ul style="list-style-type: none"> No change related to the cost estimates. However, EPA has clarified in the HVAC System Quality Installation Rater checklist that the Rater is only responsible for ensuring that the Contractor has completed the Contractor checklist in its entirety, not for assessing the accuracy of the load calculations or field verifications included.
26	<ul style="list-style-type: none"> Multiple respondents felt that additional professional liability insurance would be needed for the Quality Framing checklist, HVAC Quality Installation checklist, and Water-Managed Construction checklist because these relate to issues of structural integrity, occupant comfort, mold, and material durability. 	<ul style="list-style-type: none"> EPA did not intend to increase the liability of raters as a result of the new and expanded checklists. It has carefully reviewed the proposed checklists and has clarified requirements and responsibilities where necessary to limit ambiguities. 	<ul style="list-style-type: none"> EPA has clarified in the HVAC System Quality Installation checklist that raters are only responsible for ensuring that the contractor has completed their respective checklist, and not the accuracy of the values provided. EPA has also indicated that completion of the Water Management System checklists (formerly the Water-Managed Construction checklist) does not constitute a guarantee that the home will avoid all Water Management System -related problems. Finally, regarding the reduced thermal bridging requirements, EPA has clarified that raters need not direct

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			builders to remove framing, but instead shall simply determine compliance by confirming that particular details have been used and by assessing the amount of framing in the home that has no apparent or documented structural purpose.
27	<ul style="list-style-type: none"> One respondent also suggested that EPA enable the builders or trades to be responsible for documenting many of the non-energy items, much like the HVAC contractor will be required to do for the HVAC Quality Installation checklist, to keep the responsibility and liability with the entity that has the appropriate expertise. 	<ul style="list-style-type: none"> EPA agrees with respondents that it is appropriate for some of the items originally proposed for rater verification to instead be verified by the builder or the HVAC contractor. 	<ul style="list-style-type: none"> EPA has developed a Water Management System checklist for builders and has expanded the requirements of the HVAC System Quality Installation checklist for contractors. EPA maintains that the remaining requirements should be within the scope of a rater's expertise and can be handled during the traditional two site visits.

Marketing, Promotion, Training, & Brand Integrity

ID	Comment Summary	EPA's Response	EPA's Policy Decision
General			
28	<ul style="list-style-type: none"> Multiple respondents expressed concern that the proposed guidelines would make marketing of the ENERGY STAR program to both builders and consumers more difficult, diluting many of the appealing attributes of the current program, including limited scope and complexity, clearly cost effective return on investment, and flexibility in meeting program requirements. 	<ul style="list-style-type: none"> EPA has always believed that the value proposition for builders participating in ENERGY STAR and consumers buying qualified homes is that home buying is complex enough without having to know all the details of energy-efficient construction. Instead, consumers should just look for the government-backed ENERGY STAR label to easily identify homes that are truly energy efficient. That key message to homebuyers does not change with the new guidelines. However, for those buyers who want to dig deeper, EPA believes that the increased number of mandatory measures and inspection checklists actually makes it easier for consumers to understand specifically what energy-saving features and equipment will be found in their homes and, therefore, improves the transparency of the program. Furthermore, EPA has eliminated many of the originally proposed mandatory requirements to increase flexibility 	<ul style="list-style-type: none"> To increase flexibility for partners, EPA has eliminated mandatory requirements for lighting, appliances, ceiling fans, R-8 duct insulation, and efficient hot water distribution measures. The efficient hot water distribution measures have been removed from this iteration of the guidelines altogether. The other items will be maintained in the prescriptive path and within the ENERGY STAR Reference Design to influence their use in labeled homes.

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		for partners to meet program requirements.	
29	<ul style="list-style-type: none"> • Respondents were concerned that a more complex marketing message than what is currently required will need to be made for partners and consumers to understand the benefits of the program as the result of the following two overarching areas of concerns: <ul style="list-style-type: none"> ○ The less straightforward explanation of energy savings (i.e., 15% above code, which is generally a successful message) ○ The inclusion of requirements that are not directly related to energy efficiency, namely the Indoor Air Quality and Water-Managed Construction checklists. 	<ul style="list-style-type: none"> • See response to Question #28. • In addition, EPA will continue to promote a definition of ENERGY STAR Homes comparable to the currently used language, "To earn the ENERGY STAR, a home must meet guidelines for energy efficiency set by the U.S. Environmental Protection Agency. These homes are at least 15% more energy efficient than homes built to the 2009 IECC, and include additional energy-saving features that typically make them 20–30% more efficient than standard homes." • Further, EPA believes that the expanded checklists only strengthen the potential marketing message to consumers; e.g., "Not only are you as a homebuyer getting a home that is significantly more energy efficient than standard construction, your builder also incorporates a comprehensive approach to home construction that will help contribute to a complete thermal enclosure system the can improve comfort, proper ventilation to help ensure better indoor air quality for you and your family, and an increased resistance to the potential for water damage, mold, and maintenance problems for your most-valuable asset." 	<ul style="list-style-type: none"> • No policy change.
30	<ul style="list-style-type: none"> • Respondents submitted concerns specifically relating to marketing the 2011 guidelines to builders. These included the increased scope of the program, the substantial increase in mandatory requirements, and the increase in cost. The net result is that marketing the program to builders will be much more challenging, especially for new builder partners who will be overwhelmed with the requirements. 	<ul style="list-style-type: none"> • Despite the downturn in the housing market, ENERGY STAR homes now represent nearly 20% of the market nationally, the rigor of both national and local codes are significantly increasing, and builders are continuing to sign onto the program in record numbers. Therefore, EPA believes that the time is right to substantially raise the bar for homes to earn the ENERGY STAR label. • EPA recognizes that the latest iteration of the ENERGY STAR guidelines will require builders to make more changes than they had to for the first two iterations of the guidelines. However, EPA believes that it is critical for ENERGY STAR to continue to promote increasing levels of performance and remain relevant in the marketplace. • Some builders may feel that the new guidelines are too much for them at this time and EPA accepts that some partners may drop out of the program. ENERGY STAR is not a mandatory code. Rather, it is a voluntary program for builders who want recognition for building 	<ul style="list-style-type: none"> • No policy change regarding the requirements; however, in addition to the originally proposed one year transition period from January 1, 2010 to January 1, 2011, EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be

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		<p>superior energy-efficient homes. As such, builders who participate should expect that the program will periodically need to enhance its guidelines so that the brand continues to make good on its promise of substantially improved efficiency over code.</p> <ul style="list-style-type: none"> • EPA understands that it will take time for participating builders to ‘come up to speed’ on the new guidelines and EPA is providing as much transition time as possible to help partners adjust. • Lastly, EPA believes that the proposed 2011 guidelines continue to represent a cost-effect package of improvements for both home builders and homebuyers. 	<p>completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. These checklist sections are similar to the requirements in the current Thermal Bypass Checklist. Effectively, this plan allows partners a full two years to educate and train partners and allow them to integrate the new mandatory checklists into their workflows prior to full implementation.</p>
31	<ul style="list-style-type: none"> • One respondent requested that EPA aggressively restate its position to local jurisdictions and states that the ENERGY STAR program is not designed or intended to be a mandatory code program. 	<ul style="list-style-type: none"> • EPA has consistently guided state and local governments that ENERGY STAR Qualified Homes is designed as a voluntary program instead of a mandatory code program. It has recently met with representatives from the largest regional area using ENERGY STAR as code to suggest alternatives. 	<ul style="list-style-type: none"> • EPA will continue to promote ENERGY STAR Qualified Homes as a voluntary label and to offer alternatives to jurisdictions currently implementing or considering ENERGY STAR as code.
Marketing to Consumers, Appraisers, and Lenders			
32	<ul style="list-style-type: none"> • Respondents requested that EPA develop strategies to increase awareness, acceptance, perceived value, and demand among several specific audiences, including consumers. Specific strategies for consumers included: creating tools that generate realistic estimates of energy savings; detailing the specific, quantitative benefits of qualified homes; and developing a simple effective marketing pitch (i.e., “elevator speech”) for the new guidelines. 	<ul style="list-style-type: none"> • EPA is currently working on developing strategies for communicating ENERGY STAR 2011 for all ENERGY STAR for Homes’ stakeholders – raters, builders, sponsor programs, and consumers. <ol style="list-style-type: none"> 1. EPA is in the process of developing a consumer page highlighting the history of ENERGY STAR and the events that have led to the change in specifications. 2. EPA will update all communications materials to be released with the final ENERGY STAR 2011 specification, 3. EPA will update all trainings available to partners to reflect the specification changes. 4. EPA is also working on studies with select partners to identify the greatest training needs in building, rating, selling a home that meets ENERGY STAR 2011. • EPA will take all recommendations by respondents into consideration when finalizing our strategies. 	<ul style="list-style-type: none"> • No policy change, though EPA will continue to develop the resources noted in the response to the left.

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33	<ul style="list-style-type: none"> • Respondents requested that EPA develop strategies to increase awareness, acceptance, perceived value, and demand among several specific audiences, including appraisers: • Several respondents commented that the appraisal industry assigns no monetary benefit for qualified homes, producing the misconception among consumers that the brand provides no added value and limiting the adoption of Energy Efficient Mortgages (EEM's), particularly in the Southeast. • Respondents requested that EPA work with the Appraisal Institute to develop training that educates members about the program and its impact on market value. While the Appraisal Institute has some related training that mentions the ENERGY STAR program, its focus is on "Green". • Respondents also suggested that EPA help develop a national database of qualified homes, including addresses, so that added value can be more easily demonstrated. 	<ul style="list-style-type: none"> • EPA is currently working on developing strategies for engaging the appraisal industry, including developing clear recommendations for valuating energy efficiency of a home and coordinating with key industry players to promote appraisal industry participation. 	<ul style="list-style-type: none"> • No policy change, though EPA will continue to pursue the strategies noted in the response to the left.
34	<ul style="list-style-type: none"> • Several respondents were interested in seeing more lending products, such as EEM's, made available for qualified homes, though some respondents questioned the value of such products. • One respondent commented that the impact would be minimal because the industry is already able to go over debt-to-income ratios through an automated system. Instead, lenders would only offer such products for subjective reasons, such as their commitment to energy efficiency or to cater their business to ENERGY STAR builders. • Other respondents suggested EPA evaluate all changes proposed for the 2011 guidelines to ensure they meet FHA's metric for qualifying homes for EEM's. This metric requires that the present value of the incremental energy savings over the life of an improvement not exceed the incremental 	<ul style="list-style-type: none"> • There are efforts underway at FHA to revamp their EEM to make it more useful for borrowers and easier for lenders to understand and implement. EPA is working with FHA on this. EPA has also launched the ENERGY STAR mortgage pilot program in a limited number of states. Under this program, participating lenders agree to offer borrowers a financial benefit (i.e. reduced interest rate, closing cost discount, pay for HERS rating) if they are financing the purchase of an ENERGY STAR qualified home, or making efficiency improvements under a Home Performance with ENERGY STAR or Weatherization Assistance Program and are able to reduce energy use by at least 20%. • In general, the measures in the 2011 guidelines will meet FHA's current metric for qualifying homes for EEMs. EPA developed the 2011 guidelines using cost effectiveness as one consideration and considered whether the utility bill savings at least equaled the amortized incremental costs. For this analysis EPA used a range of costs as well as an interest rate of 6% and a 	<ul style="list-style-type: none"> • No policy change, though EPA will continue to pursue the strategies noted in the response to the left.

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	costs of providing the improvement, using the loan interest rate for the present value discount rate.	30 year period.	
Quality Assurance, Training, and Brand Integrity			
35	<ul style="list-style-type: none"> Respondents expressed concern that lax oversight has resulted in an increasing quantity of homes earning the ENERGY STAR without meeting the guidelines. For instance, in the current program service providers such as insulators may be owned by the same parent company as the verifiers. This diminishes the third-party qualification promised by the program. Respondents noted that with the increased requirements being proposed in the 2011 guidelines, especially those that fall outside the domain of the RESNET guidelines, the potential for raters to improperly qualify homes will only increase. 	<ul style="list-style-type: none"> EPA is coordinating with RESNET to integrate the new mandatory checklists into the RESNET standards and to revise the Quality Assurance guidelines and requirements for Home Energy Raters. In addition, EPA will be implementing new Quality Assurance requirements for Sponsoring programs. 	<ul style="list-style-type: none"> No policy change, though EPA will continue to pursue the strategies noted in the response to the left.
36	<ul style="list-style-type: none"> Respondents requested that EPA both work with RESNET to improve its oversight role (especially in regards to the expanded requirements of the 2011 guidelines) and also develop a more robust level of oversight that is independent of RESNET and involves true third-party random inspections. The rationale for this expansion is that RESNET's current role as oversight organization is not entirely impartial because some members of the board of directors and ethics committee are themselves involved with businesses that benefit from the organization. 	<ul style="list-style-type: none"> See response in #35. In addition, EPA is considering implementation of third-party random testing of ENERGY STAR Qualified homes. 	<ul style="list-style-type: none"> No policy change, though EPA will continue to pursue the strategies noted in the response to the left.
37	<ul style="list-style-type: none"> Some respondents suggested that it was inappropriate for RESNET to be the only verification organization associated with a publicly-funded program, such as ENERGY STAR, and that other oversight organizations and verifiers should be allowed to operate independently of RESNET. Other respondents requested that EPA clarify its current policy on Verification Oversight Organizations and what criteria it uses to 	<ul style="list-style-type: none"> EPA has a process for evaluating applications for Verification Oversight Organizations (VOO) and has laid out criteria for such applicants. EPA is open to recommendations on how VOO criteria can be enhanced and clarified. 	<ul style="list-style-type: none"> No policy change.

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	evaluate eligibility.		
38	<ul style="list-style-type: none"> One respondent suggested improving the quality assurance component of the program by creating an insurance policy for qualified homes, which would cover defects that arise within 5 or 10 years of construction. The insurance industry could then raise prices on builders that have too many claims for defective work. 	<ul style="list-style-type: none"> EPA understands that as requirements increase, the requirements for QA will be commensurately higher. EPA is not sure that the development of an insurance policy would be effective, but is evaluating several options for enhancing the rigor of ensuring conformance to guidelines, including the possibility of using utility bill data to validate program impacts. 	<ul style="list-style-type: none"> No policy change, though EPA will continue to pursue the strategies noted in the response to the left.
39	<ul style="list-style-type: none"> Another respondent suggested improving the quality assurance component of the program by using measured utility bill data rather than modeling to ensure that energy savings are achieved. 	<ul style="list-style-type: none"> EPA understands that as requirements increase, the requirements for QA will be commensurately higher. EPA is evaluating several options for enhancing the rigor of ensuring conformance to guidelines, including the possibility of using utility bill data to validate program impacts. 	<ul style="list-style-type: none"> No policy change, though EPA will continue to pursue the strategies noted in the response to the left.
40	<ul style="list-style-type: none"> On the subject of training, several respondents noted that a significant effort will be needed to train program implementers, builders, raters, and trades (especially HVAC contractors) to meet the 2011 guidelines. Many raters do not currently have the expertise that will be required to assess compliance. Therefore, training for raters will be particularly important to ensure that ratings are being done correctly and consistently and that raters are effectively communicating the requirements of the new guidelines to builders and other building industry professionals. Respondents requested that EPA work with RESNET to increase and enhance their training program, including online options, and make the improved training a mandatory requirement for all raters. Specific training topics requested include: <ul style="list-style-type: none"> Determining compliance with the Indoor Air Quality checklist and ASHRAE 62.2 Conducting worst-case exhaust air flow test. Determining compliance with the 	<ul style="list-style-type: none"> EPA is planning to develop training for all partners and, in particular, more comprehensive training for raters on the new guidelines. General trainings will be available online. More complex and in-depth trainings will be available nationwide, and will cover the new checklists and the raters' responsibilities and requirements for each checklist. Additionally, EPA already has plans for developing supplemental technical guidance corresponding to each of the new checklists to provide further technical support to our partners. Lastly, EPA is also working with ACCA and other HVAC professionals regarding the development of appropriate training for raters and HVAC contractors regarding the new guidelines. 	<ul style="list-style-type: none"> No policy change, though EPA will continue to pursue the strategies noted in the response to the left.

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	<p>HVAC Quality Installation checklist; understanding the basics of ACCA Manual J, D, S, and T; and potentially training raters on sizing and load software, such as Wrightsoft.</p> <ul style="list-style-type: none"> ○ Determining compliance with the Water-Managed Construction checklist and understanding the building science behind it. ○ Determining compliance with the Quality Framing checklist. 		
41	<ul style="list-style-type: none"> • Respondents also suggested that EPA develop analogous, mandatory training for builder partners and trade allies as a precondition for participation. 	<ul style="list-style-type: none"> • EPA already has plans for developing mandatory online training for ENERGY STAR partners. Partnerships with ENERGY STAR will be contingent upon participation in the required training within three months of signing an agreement. Current partners will also be required to take mandatory training, but will have until the end of June 2011 to complete the training in order to keep their partnership status active with ENERGY STAR. 	<ul style="list-style-type: none"> • No policy change to guidelines, though EPA will continue to pursue the strategies noted in the response to the left.

Implementation Timeline of 2011 Guidelines

ID	Comment Summary	EPA's Response	EPA's Policy Decision
42	<ul style="list-style-type: none"> • Many respondents expressed concern about the speed with which the 2011 guidelines would take affect, requesting either a delay or a phased approach to implementation. The primary reasons cited for providing additional time included: <ul style="list-style-type: none"> ○ Allowing market conditions to improve so that builders will be less impacted by program cost increases ○ Allowing implementers to develop and execute training to increase the infrastructure for the greatly expanded areas of required expertise (particularly for HVAC contractors, who don't routinely complete field evaluations) ○ Allowing vendors to develop compliant software so that raters can 	<ul style="list-style-type: none"> • EPA considers the rigorous new guidelines as an important market differentiator by raising the 'quality bar' when competing with existing homes. This is particularly true under current market conditions likely to prevail with foreclosed homes. Thus, rather than waiting for market conditions to improve, EPA believes it needs to get the new guidelines out as quickly as possible. However, EPA also recognizes that training and other necessary transition processes are important and must be accommodated. • EPA will release the new guidelines, as well as complementary training and supplemental technical resources, as quickly as possible. This will allow builder partners that desire the improved performance and quality of the new guidelines to begin implementation as soon as possible. However, the guidelines will have an approximate one-year transition period prior to mandatory implementation on January 1, 2011. 	<ul style="list-style-type: none"> • EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. • Additionally, EPA will make

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	<p>create compliance options for their clients,</p> <ul style="list-style-type: none"> ○ Aligning with the implementation date of more aggressive federally-mandated building codes. 	<p>Furthermore, EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. These checklist sections are similar to the requirements in the current Thermal Bypass Checklist. Effectively, this plan allows partners a full two years to educate and train partners and allow them to integrate the new mandatory checklists into their workflows prior to full implementation. Additionally, EPA will make available a new ENERGY STAR Qualified Homes label starting January 1, 2011 to provide builders an opportunity to differentiate homes that are qualified prior to January 1, 2012 that use the full requirements of the new guidelines, including all mandatory checklists.</p>	<p>available a new ENERGY STAR Qualified Homes label starting January 1, 2011 to provide builders an opportunity to differentiate homes that are qualified prior to January 1, 2012 that use the full requirements of the new guidelines, including all mandatory checklists.</p>
43	<ul style="list-style-type: none"> • Respondents generally requested an extension of one to four years beyond the currently proposed implementation date of 2011. Specific suggestions included: <ul style="list-style-type: none"> ○ Delay mandatory implementation of the new checklists (but not the general performance or prescriptive path requirements) for an additional 12-18 months while the industry develops the ability to incorporate the new requirements into their processes, similar to the delay that was allowed for the original Thermal Bypass Inspection checklist. ○ Delay mandatory implementation of just the checklists that will require the most training (i.e., HVAC Quality Installation, Water-Managed Construction, and Indoor Air Quality) for an additional 12-24 months. ○ Make some of the most difficult items within the new checklists, especially for the HVAC Quality Installation, 	<ul style="list-style-type: none"> • EPA considers the rigorous new guidelines as an important market differentiator by raising the ‘quality bar’ when competing with existing homes. This is particularly true under current market conditions likely to prevail with foreclosed homes. Thus, rather than waiting for market conditions to improve, EPA believes it needs to get the new specifications out as quickly as possible. However, EPA also recognizes training and other necessary transition processes are important and must be accommodated. • EPA will release the new guidelines, as well as complementary training and supplemental technical resources, as quickly as possible. This will allow builder partners that desire the improved performance and quality of the new guidelines to begin implementation as soon as possible. However, the guidelines will have an approximate one-year transition period prior to mandatory implementation on January 1, 2011. Furthermore, EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during 	<ul style="list-style-type: none"> • EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. • Additionally, EPA will make available a new ENERGY STAR Qualified Homes label starting January 1, 2011 to provide builders an opportunity to differentiate homes that are

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	<p>optional instead of mandatory for an extended period of time. This will allow the market to become familiar with the requirements without risking disqualification of homes.</p> <ul style="list-style-type: none"> ○ Delay the implementation date until a market achieves a specified level of market penetration under the current guidelines. 	<p>the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced. These checklist sections are similar to the requirements in the current Thermal Bypass Checklist. Effectively, this plan allows partners a full two years to educate and train partners and allow them to integrate the new mandatory checklists into their workflows prior to full implementation. Additionally, EPA will make available a new ENERGY STAR Qualified Homes label starting January 1, 2011 to provide builders an opportunity to differentiate homes that are qualified prior to January 1, 2012 that use the full requirements of the new guidelines, including all mandatory checklists.</p> <ul style="list-style-type: none"> ● While EPA has modified the organization of the checklist requirements, nearly all of the requirements have been maintained in this latest iteration of the draft guidelines because EPA considers them to be critical to meeting its performance and marketing goals for the program. 	<p>qualified prior to January 1, 2012 that use the full requirements of the new guidelines, including all mandatory checklists.</p>
44	<ul style="list-style-type: none"> ● Many respondents expressed interest in evaluating a revised set of guidelines during a second comment period, prior to finalizing the 2011 guidelines. One respondent thought that EPA's current approach for review and comment on the draft guidelines is insufficient and that the process should be publicized in accordance with the notice and comment procedures of the Administrative Procedures Act ("APA"). This respondent noted that the Federal Register would reach a wider audience and provide the agency with more diverse comments from the public than simply soliciting comments through the internet. 	<ul style="list-style-type: none"> ● EPA has promoted the revision of the guidelines to all of its partners and key stakeholders and has additionally solicited comments from all interested parties through its website. This has resulted in over 350 pages of comments from hundreds of unique respondents, representing a wide range of viewpoints. In addition, EPA continually gathers expert input and researches new technology costs and performance developments during the implementation of each iteration of the guidelines. For these reasons, EPA feels that its current process for soliciting feedback is adequate, particularly given that ENERGY STAR is a voluntary guideline and not a mandatory standard ● EPA agrees with respondents that enough significant feedback was received during the first comment period to warrant a second comment period prior to finalization of the 2011 guidelines. 	<ul style="list-style-type: none"> ● EPA has instituted a second, shorter, comment period for stakeholders to review and respond to the revised guidelines that were developed as a result of the comments received during the first comment period.
45	<ul style="list-style-type: none"> ● The National Propane Gas Association and American Gas Association also requested a revised set of guidelines that evaluates the proposed changes using a "full-fuel-cycle" rather than "point-of-use" savings methodology. They note the recent release of 	<ul style="list-style-type: none"> ● Numerous savings metrics exist and each provides strengths and advantages when evaluating program requirements. For evaluating the savings associated with the 2011 guidelines, EPA is using a source-based metric. While EPA appreciates the information provided by the National Propane Gas Association and American 	<ul style="list-style-type: none"> ● No policy change.

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	<p>a study conducted by DOE, entitled “Review of Site (Point-of-Use) and Full-Fuel-Cycle Measurement Approaches to DOE/EERE Building Appliance Energy-Efficiency Standards”, which they claim recommends the use of fuel-fuel-cycle analysis as the preferred approach for achieving our nation’s energy goals.</p>	<p>Gas Association and may consider using alternative metrics in the future, it does not intend to consider alternative metrics for the 2011 guidelines, given that the process is nearly complete.</p>
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General Feedback on Technical Components of the Guidelines

ID	Comment Summary	EPA’s Response	EPA’s Policy Decision
46	<ul style="list-style-type: none"> • One respondent requested that EPA define program requirements at the national rather than regional level. This would reward states that adopt progressive codes that are more in line with ENERGY STAR guidelines, rather than discouraging them by increasing the stringency of the guidelines. • In contrast, multiple respondents requested that states and program sponsors be permitted to work with EPA to develop modified regional program guidelines, similar to Hawaii, including the possibility of adopting more stringent efficiency requirements or eliminating some of the checklists. • One respondent questioned what policy would be implemented if the local code exceeded the 2011 guidelines in all ways, such that the guidelines were not meaningfully more stringent. 	<ul style="list-style-type: none"> • ENERGY STAR is a national brand that promises consumers substantially better performance than standard practice. Billions of dollars have been invested in building this brand and the logo is now recognized by over 75% of consumers nationwide. In order to protect the integrity of the brand, EPA must ensure that the new homes guidelines ensure meaningful savings, even in locations with progressive codes. It is for this reason that EPA has a tradition of developing regional solutions. Thus, EPA agrees that it’s important to develop customized solutions for states and regions with rigorous energy codes. However, due to resource constraints, EPA will not be able to develop customized solutions for progressive codes adopted at the local level, for which fewer homes will overlap with the program. 	<ul style="list-style-type: none"> • EPA will continue to develop customized solutions for states with rigorous energy codes including additional ENERGY STAR Reference Designs to accommodate compliance through both the prescriptive and performance path.
47	<ul style="list-style-type: none"> • Respondents with specific regional concerns included: <ul style="list-style-type: none"> ○ Oregon, who believes their current ENERGY STAR program requirements are similar to the proposed 2011 guidelines and request that their program definition be maintained until April 2011, when their next code change goes into effect. ○ Washington, who is currently revising 	<ul style="list-style-type: none"> • EPA agrees it’s important to develop customized solutions for states with rigorous energy codes. 	<ul style="list-style-type: none"> • EPA will continue to develop customized solutions for states with rigorous energy codes including additional ENERGY STAR Reference Designs to accommodate compliance through both the prescriptive and performance path.

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	<p>their code and for which initial analysis suggests that the proposed 2011 guidelines will be less stringent than the code west of the Cascades and will save less than 5% east of the Cascades.</p> <ul style="list-style-type: none"> ○ Vermont, who requested a more stringent standard, defined with a fixed HERS index for each benchmark home size. 		
48	<ul style="list-style-type: none"> ● Many respondents felt that too many mandatory requirements had been included, thereby limiting the flexibility of partners to find the most cost-effective solution for achieving energy savings and adding unnecessary complexity to the program. This was particularly true for the mandatory Quality Framing, Indoor Air Quality, and Water-Managed Construction checklists. Multiple respondents were not convinced that their inclusion was necessary for a program that is primarily focused on energy efficiency and carbon reductions. Furthermore, these requirements create inefficiencies and unnecessary challenges because of overlapping authority in the areas of framing decisions (with the architect, structural engineer, and framer), and HVAC installation and commissioning (with the HVAC contractor and mechanical engineer). In a similar regard, they may be similar but not identical to code requirements and to related programs, such as LEED for Homes. The net result of this added complexity may be that fewer partners participate, despite the fact that the energy savings requirements of the program are still very achievable. Some respondents suggested eliminating these requirements, while others suggested that EPA work more closely with related organizations to ensure continued promotion of ENERGY STAR. 	<ul style="list-style-type: none"> ● Upon review of the proposed guidelines, EPA agreed with respondents that there were too many mandatory requirements. However, it also determined that it was critical that the new guidelines, in addition to producing meaningful savings, provide a comprehensive building science package that helps to ensure a complete and effective thermal enclosure system, HVAC system, and Water Management System. These additional components are interrelated with the energy efficiency requirements and research indicates that their omission is the major cause of consumer complaints and possible defects in qualified homes. Moreover, these additional components allow EPA to market qualified homes as being both energy efficient and high quality to American homebuyers. Thus, despite some potential for overlap with related programs, EPA must define the guidelines in a way that qualified homes will offer both meaningful savings, accompanied by associated reductions in greenhouse gas emissions, and compelling value for builder partners and consumers. 	<ul style="list-style-type: none"> ● EPA has eliminated mandatory requirements for lighting, appliances, ceiling fans, R-8 duct insulation, and efficient hot water distribution measures. The efficient hot water distribution measures have been removed from this iteration of the guidelines altogether. The other items will be maintained in the prescriptive path and within the ENERGY STAR Reference Design to influence their use in labeled homes. ● EPA will retain the Thermal Enclosure System Rater checklist (which now encompasses the requirements of the proposed Quality Framing checklist and current Thermal Bypass Checklist), HVAC System Quality Installation checklist (which now encompasses the ventilation requirements from the proposed IAQ checklist), and Water Management System checklist.

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49	<ul style="list-style-type: none"> • One respondent felt that lighting and appliances should also be excluded given their impermanence in the home. 	<ul style="list-style-type: none"> • Upon review of the proposed guidelines, EPA agrees with respondents that ENERGY STAR Qualified lighting and appliances do not need to be mandatory. 	<ul style="list-style-type: none"> • EPA has eliminated mandatory requirements for lighting and appliances. However, these items will be maintained in the prescriptive path and within the ENERGY STAR Reference Design to influence their use in labeled homes.
50	<ul style="list-style-type: none"> • One respondent felt that EPA should provide guidance to partners regarding proper selection of materials, specifically promoting ease of constructability; repeatability; cost-effectiveness; minimization of multi-trade involvement; service life compatibility; material compatibility; durability; proper application; ease of substituting alternate materials; and simplicity. 	<ul style="list-style-type: none"> • Upon review of the proposed guidelines, EPA agrees with respondents that extensive guidance should be provided for the new technical requirements. 	<ul style="list-style-type: none"> • EPA will provide extensive training and guidance on technical requirements through the creation of field guides, webinars, and regional training seminars.
51	<ul style="list-style-type: none"> • Despite the general lack of enthusiasm for mandatory measures, some respondents provided ideas for additional mandatory requirements in new areas: <ul style="list-style-type: none"> ○ Require homes to include piping and wiring to the roof to reduce the cost for installing a solar water heater in the future. ○ Require that all homes comply with the latest edition of the IECC regardless of jurisdiction, rather than just compliance with the local code. ○ Require a maximum 60A circuit to limit total consumption of the home ○ Require separate outlet switching to allow consumers to eliminate standby loads for equipment that's not in use. 	<ul style="list-style-type: none"> • While EPA appreciates the innovative ideas provided by respondents for additional mandatory requirements, it does not intend to implement them for this iteration of the guidelines given substantial concerns by respondents about extensive mandatory requirements. In addition, EPA is reluctant to add additional requirements without compelling evidence that they will contribute meaningful energy savings or improved thermal enclosure systems, HVAC system installations, or water management systems. 	<ul style="list-style-type: none"> • Regarding required compliance with the latest IECC code, EPA is effectively requiring this by ensuring that savings exceed the code by at least 15%. However, to ensure that an effective thermal enclosure system is provided with every qualified home, EPA has added a requirement that all homes must meet or exceed the prescriptive requirements for window performance and insulation levels contained within the 2009 IECC.
52	<ul style="list-style-type: none"> • Many respondents suggested the proposed guidelines contain ambiguities that need to be clarified prior to implementation. <ul style="list-style-type: none"> ○ One respondent suggested that EPA should strive to make all requirements clear, concise, objective, doable, documentable, and verifiable. 	<ul style="list-style-type: none"> • EPA does strive to create guidelines that meet the objectives listed by the respondent and has used the public comment process to allow respondents to identify language that is confusing or ambiguous. 	<ul style="list-style-type: none"> • EPA has made many revisions to the proposed guidelines to address concerns raised by respondents about the clarity, conciseness, achievability, and objectiveness of the requirements and their ability to be verified and documented.

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	<ul style="list-style-type: none"> ○ Another respondent suggested that EPA convene an advisory panel to refine the language of the checklists for clarity. 		
53	<ul style="list-style-type: none"> ● Suggestions to improve the clarity of the National Program Requirements: <ul style="list-style-type: none"> ○ Dictate whether each footnote applies to the prescriptive path, the performance path, or both. ○ Remove footnotes that are purely informational and not requirements of the program. These include footnote 6 (promoting labeled appliances), 7 (promoting the ALP), 17 (promoting ENERGY STAR water heaters), and 20 (promoting ducts in conditioned space). ○ Reduce the number of footnotes and ensure that all requirements be incorporated into the main body of the document. ○ Clarify whether the checkboxes that currently accompany the mandatory requirements in Exhibit 1 must be completed by the rater. ○ In the introduction, EPA states that “a home shall meet..”. To improve clarity, define the term “home”. ○ Update footnote 13 now that the updated ENERGY STAR labeled windows guidelines have been finalized. ○ Footnote 1 of the National Program Requirements includes the phrase, “depending on the compliance path selected.” Clarify that there are only two compliance paths and which path this statement applies to. ○ More clearly differentiate between the requirements of the ENERGY STAR Reference Design and the prescriptive path. 	<ul style="list-style-type: none"> ● EPA agrees with many of these suggestions provided by respondents. 	<ul style="list-style-type: none"> ● EPA has: <ul style="list-style-type: none"> ○ Clarified whether footnotes apply to the performance path, prescriptive path, or to both, ○ Removed footnotes that were purely informational, ○ Where possible, moved requirements from the footnotes to the main body of the documents, ○ Removed the checkboxes that were next to mandatory requirements, ○ Updated footnote 13, ○ Removed the confusing phrase noted in footnote 1, and, ○ Created a separate document with an expanded ENERGY STAR Reference Design definition for use with the performance path.

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54	<ul style="list-style-type: none"> • Suggestions to improve the clarity of the overall documents include the following: <ul style="list-style-type: none"> ○ Explicitly state whether raters are required to verify compliance with local code requirements in order to qualify a home with ENERGY STAR. ○ Unless EPA intends to define “EPA-approved verifier”, remove this phrase from the guidelines. ○ Multiple respondents were confused by the term “BOP Inspector”. Consider removing if this is no longer applicable. ○ Clarify which supplemental documents contain additional requirements and which are purely informative. ○ Where possible, use layman terms in place of technical terminology. Similarly, develop compliance documentation that is trade-specific (i.e. for Framers, HVAC, Air Sealers, and Insulators) and available in English and Spanish. ○ Review the “Guide to the use of Standards” in the ICC for assistance in writing the program requirements and refer to the Construction Specifications Institute’s Manual of Practice for drafting techniques. 	<ul style="list-style-type: none"> • EPA agrees with many of these suggestions provided by respondents. Note that the national program requirements reference all other documents that are required for qualification and that EPA strives to use technically accurate terminology in all of its documents. 	<ul style="list-style-type: none"> • EPA has: <ul style="list-style-type: none"> ○ Clarified statements related to code compliance requirements, ○ Removed the term “EPA-approved verifier” from all documents, and, ○ Retained the term “BOP Inspector”, which is defined within the RESNET guidelines.
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ENERGY STAR Reference Design & Prescriptive Path

ID	Comment Summary	EPA’s Response	EPA’s Policy Decision
55	<ul style="list-style-type: none"> • Respondents requested that EPA develop alternative compliance paths that would allow homes larger than the benchmark home size to utilize the prescriptive path. • Respondents also requested that EPA provide a separate prescriptive path for attached homes that addresses the unique characteristics of that house type, as it does 	<ul style="list-style-type: none"> • At this time, EPA believes that the limited benefit of multiple prescriptive packages for homes of varying sizes and bedrooms does not warrant the considerable resources that would be required for EPA to design them. However, it will continue to evaluate partners’ needs after implementation of the guidelines. • EPA does agree with respondents that a unique prescriptive path for attached housing is warranted. 	<ul style="list-style-type: none"> • No immediate policy change, though EPA will pursue the development of a unique prescriptive path for attached homes.

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	today.		
56	<ul style="list-style-type: none"> • Respondents' recommendations for altering the window area of the ENERGY STAR Reference Design included: increasing the window area to 20%, decreasing it to 15%, or aligning it with the 2009 IECC performance path by setting it equal to the rated home window area or to 15%, whichever is less. • One respondent also requested that EPA ensure that the formula in footnote 15 used for determining total window area is aligned with RESNET's formula. 	<ul style="list-style-type: none"> • EPA inadvertently used 18% WFA in the Reference Design, while the intention was to align with the definition in the 2009 IECC, which sets the window area equal to the rated home window or to 15%, whichever is less. • EPA notes that the formula included in footnote 15 does align with RESNET's formula. 	<ul style="list-style-type: none"> • EPA has modified the definition for window area in the ENERGY STAR Reference Design to align with the 2009 IECC.
57	<ul style="list-style-type: none"> • Respondents' suggestions for clarifying the ENERGY STAR Reference Design definition included the following: <ul style="list-style-type: none"> ○ Clarify that the ventilation system should be modeled with no heat recovery. ○ Clarify that the conditioning of the basement should match that of the rated home. ○ Clarify that the same fuel type used by the rated home should be used in the ENERGY STAR Reference Design and explain how homes with dual fuels should be modeled (e.g., fossil-fuel radiant heating system with a small backup heatpump) ○ Clarify what level of appliance efficiency should be modeled when the appliance type is not included in the rated home. For example, when a refrigerator is not installed in the rated home, how should the ENERGY STAR Reference Design be modeled? Multiple respondents felt that including ENERGY STAR appliances in these situations would unfairly penalize the rated home. ○ Clarify the definition of and explain the rationale for modeling the 	<ul style="list-style-type: none"> • EPA agrees with many of the clarifications requested by respondents. Note that EPA's requirement to model the windows with an even distribution aligns with RESNET's configuration for the RESNET reference home and allows the rated home to take advantage of optimal orientation. 	<ul style="list-style-type: none"> • EPA has created a new document called "2011 ENERGY STAR HERS Index Target Procedure", which includes an expanded definition of the ENERGY STAR Reference Design to be used when calculating the ENERGY STAR HERS index target. This document includes the following clarifications requested by respondents: <ul style="list-style-type: none"> ○ Clarified that the ventilation systems shall be modeled without heat recovery, ○ Clarified that the conditioning of the basement should match that of the rated home, ○ Clarified that ENERGY STAR refrigerators, dishwashers, ceiling fans, and 80% fluorescent lighting shall be modeled in all cases, ○ Clarified the definition of above-grade wall and below-grade walls to align

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	<p>ENERGY STAR Reference Design with windows evenly distributed</p> <ul style="list-style-type: none"> ○ Clarify the definition of above-grade and below-grade walls ○ Clarify the framing fraction of the walls that should be assumed for the ENERGY STAR Reference Design. Consider using RESNET's current default of 19% for walls with advanced framing. 		<p>with RESNET's definition, and,</p> <ul style="list-style-type: none"> ○ Defined the thermal performance of the walls, floors, and ceilings in terms of component U-values, eliminating the need to specify framing fractions.
58	<ul style="list-style-type: none"> • One respondent suggested configuring the ENERGY STAR Reference Design with the same roof type, solar absorptance, and emittance as the rated home. 	<ul style="list-style-type: none"> • EPA has aligned the roof type, solar absorptance, and emittance with the HERS Reference Home definition so that rated homes with improved values can receive credit towards meeting the ENERGY STAR HERS index target. 	<ul style="list-style-type: none"> • No policy change.
59	<ul style="list-style-type: none"> • One respondent suggested defining insulation requirements in terms of U-values instead of in terms of nominal R-values and insulation grades to eliminate ambiguities. 	<ul style="list-style-type: none"> • EPA agrees with the respondent that defining component U-values rather than R-values will eliminate ambiguities when calculating the ENERGY STAR HERS index target. 	<ul style="list-style-type: none"> • EPA has created a new document called "2011 ENERGY STAR HERS Index Target Procedure", which includes an expanded definition of the ENERGY STAR Reference Design to be used when calculating the ENERGY STAR HERS index target. This document includes component U-values, rather than R-values, to define the performance of walls, ceilings, and floors.
60	<ul style="list-style-type: none"> • One respondent suggested specifying the efficiency of the ventilation fan to match that of an ENERGY STAR qualified fan, otherwise builders that use bathroom exhaust for ventilation always get credit for the mandatory requirement to use ENERGY STAR qualified exhaust fans. 	<ul style="list-style-type: none"> • EPA believes that even though ENERGY STAR qualified exhaust fans are a mandatory requirement for full baths, partners that use them as part of the ventilation system should receive credit towards meeting the ENERGY STAR HERS index target. 	<ul style="list-style-type: none"> • No policy change.
61	<ul style="list-style-type: none"> • One respondent suggested that for two-story homes with crawlspaces and basements, consider modeling half of the ducts in the attic and half in the crawlspace or in the basement. The respondent suggested that this is not an uncommon configuration. 	<ul style="list-style-type: none"> • EPA agrees with the respondent's suggestion. 	<ul style="list-style-type: none"> • EPA has modified the duct location definition in the ENERGY STAR Reference Design for two-story homes with basements or crawlspaces, such that 50% of the ducts are located in the attic and 50% are located in the foundation space.

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62	<ul style="list-style-type: none"> Respondents also requested that EPA provide specific examples of ENERGY STAR Reference Design specifications for housing configurations of different sizes, fuel types, and climate zones to better illustrate the proposed performance path. 	<ul style="list-style-type: none"> EPA will develop additional documentation that more clearly illustrates how to configure the ENERGY STAR Reference Design for the purpose of calculating the ENERGY STAR HERS index target. 	<ul style="list-style-type: none"> No policy change, though EPA will continue to develop the resources noted in the response to the left.
63	<ul style="list-style-type: none"> Regarding cooling and heating equipment, one respondent felt that the required HSPF was too high to be achievable with readily available products, while another proposed requiring ENERGY STAR efficiency levels that will be in effect in 2011 for all equipment. 	<ul style="list-style-type: none"> EPA has mostly aligned with the current levels of efficiency that are required for ENERGY STAR qualified cooling and heating products, which have been individually evaluated for cost-effectiveness. The one exception is for heatpumps in cold climates, for which the extreme temperatures require performance that exceeds current ENERGY STAR efficiency levels. For these systems, a review of the AHRI database reveals thousands of models available at efficiencies of 8.5 HSPF and higher, hundreds of models available at efficiencies of 9.2 HSPF and higher, and dozens available at efficiencies of 9.5 HSPF and higher. EPA is unsure of the levels of efficiency that will be required for cooling and heating equipment in 2011. EPA's intent is to continue to align with changes in the program, but will assess them on a case-by-case basis. 	<ul style="list-style-type: none"> No policy change regarding reduced heatpump efficiencies in cold climates or attempted alignment of HVAC efficiency with future specifications.

ENERGY STAR Performance Path

ID	Comment Summary	EPA's Response	EPA's Policy Decision
64	<ul style="list-style-type: none"> Multiple respondents requested that EPA clarify whether it intends to allow or mandate that the ENERGY STAR Reference Design be configured manually by Raters, instead of having the ENERGY STAR Reference Design automatically configured within software programs. If configured manually, multiple respondents suggested that the added time and expense required and increased potential for input errors would more than offset the value that would be added by using a variable index. If automated, multiple respondents requested that the software be released well in advance of implementation. 	<ul style="list-style-type: none"> EPA highly encourages HERS software providers to automate the ENERGY STAR Reference Design configuration and determination of the ENERGY STAR HERS Index Target. However, EPA cannot force the manufacturers to augment their software and has designed the performance path so that compliance can be assessed without automated software. In addition, if vendors don't automate the process, EPA analysis indicates that the proposed performance path should not impose a significant burden. This is because the ENERGY STAR Reference Design is very similar to the rated home. Therefore, once the ENERGY STAR Reference Design has been modeled, minimal additional effort will be required to model the rated home, which is a task that all rates must do under the current guidelines. 	<ul style="list-style-type: none"> EPA has clarified that configuration of the ENERGY STAR Reference Design shall be completed manually by a Rater until a version of the RESNET-accredited software program used by each Rater becomes available that automatically configures the ENERGY STAR Reference Design and calculates its associated HERS index value and then applies the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Upon announcement of the release of

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			such a version, Raters using that software program shall have 60 days to begin all new ratings with this updated version.
65	<ul style="list-style-type: none"> Multiple respondents requested that EPA clarify whether it intends for raters or providers to individually decide whether the national ENERGY STAR Reference Design must be altered to reflect more stringent local codes and changes in ENERGY STAR labeled product guidelines or if EPA will provide specific and explicit guidance when changes are required. Making these determinations can be a difficult process given multiple compliance paths within codes and because codes are not written in a standardized format that facilitates direct comparisons. If raters are required to make these decisions, multiple respondents suggested that the added time and expense required and increased potential for input errors would make program implementation unfeasible. In addition, if EPA is to provide guidance, multiple respondents requested that EPA provide clear timelines on how fast the changes must be incorporated once issued. 	<ul style="list-style-type: none"> Based on respondents' comments, EPA agrees that it is incumbent upon EPA to clarify and establish specific guidance for states with rigorous energy codes. Similarly, EPA agrees that clear timelines for incorporation of customized ENERGY STAR Reference Designs should be provided. 	<ul style="list-style-type: none"> EPA will provide specific guidance for customized ENERGY STAR Reference Designs on an as-needed basis. Raters shall not alter the configuration of the ENERGY STAR Reference Design unless directed to do so by EPA. EPA will establish a specific timeline (e.g., six-month to one-year) for incorporating the customized requirements. Those homes that choose to fully comply with the new guidelines during that transition period will be allowed to use a new label distinguishing compliance with the latest guidelines. Those that don't shall use the current label.
66	<ul style="list-style-type: none"> Multiple respondents requested that EPA consider alternative definitions for the performance path. Multiple respondents proposed or expressed support for the creation of a matrix of HERS index values that are specific to house size and climate zone. This would allow for necessary variation without as much complexity as using the ENERGY STAR Reference Design. 	<ul style="list-style-type: none"> Detailed EPA analysis clearly shows that EPA can more effectively promote a consistent bundle of energy efficiency improvements with the proposed performance path, which relies on the ENERGY STAR HERS Index Target for each rated home rather than a fixed HERS index value. This is due to the substantial variation in the HERS index that results from components of the home that are not influenced by a market transformation program, such as fuel type, location within a climate zone, foundation, aspect ratio, and number of bedrooms 	<ul style="list-style-type: none"> No policy change.
67	<ul style="list-style-type: none"> Alternatively, multiple respondents commented that they would prefer that EPA maintain a fixed HERS index that is simply more stringent, rather than switching to a variable HERS index. The primary objection expressed is that 	<ul style="list-style-type: none"> Detailed EPA analysis clearly shows that EPA can more effectively promote a consistent bundle of energy efficiency improvements with the proposed performance path, which relies on the ENERGY STAR HERS Index Target for each rated home rather than a fixed HERS index value. This is due to the substantial variation in the 	<ul style="list-style-type: none"> EPA will continue to move forward with the proposed performance path. EPA will work with RESNET to incorporate all ENERGY STAR Qualified Homes checklists into

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	<p>moving from a fixed to variable HERS index will result in a more complex marketing message to builders, consumers, and program sponsors and that the added complexity may discourage participation in the ENERGY STAR program.</p> <ul style="list-style-type: none"> Multiple respondents felt that the increased complexity will mean that more marketing time will be spent explaining the ENERGY STAR Reference Design and variable HERS index rather than the benefits being offered by the program. One respondent has found that the LEED for Homes program suffers from the same marketing difficulties due to its complexity. In addition, associating the program with a fixed HERS index value allows for easier comparison of the stringency of the program to other programs that rely on the HERS index. One respondent expressed concern that a variable HERS index would preclude production builders from using a single set of upgrades across homes to earn the ENERGY STAR. In light of these concerns, multiple respondents suggested that EPA work with RESNET to adjust the HERS methodology so that a single HERS index can be used, rather than switching to a variable system to overcome the challenges that EPA has encountered with the current methodology. At a minimum, it was suggested that EPA work with RESNET to ensure that the standards are revised to reflect the energy savings from the new requirements of the guidelines (e.g., clothes washers, HVAC commissioning). 	<p>HERS index that results from components of the home that are not influenced by a market transformation program, such as fuel type, location within a climate zone, foundation, aspect ratio, and number of bedrooms.</p> <ul style="list-style-type: none"> EPA does not anticipate that the proposed performance path will significantly confuse the marketing message for the program. Homes today achieve a wide variety of HERS index values beyond the fixed values required by the current guidelines, due to utility program incentives, differences in architectural characteristics among a group of homes with the same efficiency upgrades, etc. Moreover, EPA anticipates that it will actually be easier to communicate the benefits of the new guidelines, which will deliver a much more consistent bundle of energy efficiency and quality improvements to qualified homes, including meaningful savings, a complete thermal enclosure system, quality-installed HVAC system, and water management system. Lastly, the proposed performance path will actually enhance the ability of production builders to use the same set of efficiency measures across multiple home types. When homes with different architectural characteristics share the same set of upgrade measures, they achieve a variety of HERS index values. Under the proposed performance path, this phenomenon is recognized and explicitly allowed due to the floating HERS index. EPA agrees that it is important to work with RESNET to incorporate all ENERGY STAR Qualified Homes checklists into the RESNET standards and to modify the HERS standards to recognize all requirements that impact energy savings. 	<p>the RESNET standards and to modify the HERS standards to recognize all requirements that impact energy savings.</p>
68	<ul style="list-style-type: none"> Multiple respondents suggested that EPA adopt a metric altogether different than the HERS index or at least allow the use of modeling tools other than those accredited by RESNET. 	<ul style="list-style-type: none"> EPA recognizes there are many options and metrics for specifying energy efficiency performance. However, none of the reviewers providing comments provided a clear case where EPA's proposed use of RESNET's HERS Index metric and mandatory checklists would not 	<ul style="list-style-type: none"> No policy change.

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	<ul style="list-style-type: none"> One respondent claimed that current accredited tools don't accurately reflect consumption in the Pacific Northwest. Regarding alternative metrics, one respondent suggested the use of absolute power density, while another suggested using purchased energy. A third respondent suggested that the metric be based upon source energy consumption, which they stated would be a better metric for promoting low-carbon homes, would better align with EPA's approach for commercial sector buildings, and would better align with recommendations by the National Academy of Sciences regarding appliance efficiency standards. In addition, one respondent suggested that EPA consider adoption of the Energy Performance Score (EPS). 	<p>achieve EPA's objective for ensuring a comprehensive building science package.</p> <ul style="list-style-type: none"> EPA allows any RESNET-accredited software tool to be used for compliance with the performance path; therefore, respondents concerned with the performance in the Pacific Northwest of currently accredited tools may develop additional RESNET-accredited tools that better suit their needs. 	
69	<ul style="list-style-type: none"> Multiple respondents felt that EPA needs to continue to refine the performance path for attached housing. They expressed concern that even with the size adjustment factor it will be too difficult to reach the required HERS index, in part because the amount of window area in the reference home is reduced for common walls, below grade walls, and bermed walls. Note that this concern will likely be resolved if the proposed performance path is implemented, due to the use of the ENERGY STAR Reference Design and dynamic ENERGY STAR HERS index target. 	<ul style="list-style-type: none"> EPA believes that the proposed performance path will resolve the issues cited by respondents regarding attached housing. By requiring a HERS index value that's explicitly tied to the performance of each house using the prescriptive path, rather than requiring a fixed HERS index for all homes, the impact of architectural parameters such as reduced window area in the reference home will be minimized. 	<ul style="list-style-type: none"> No policy change.
70	<ul style="list-style-type: none"> Multiple respondents suggested that EPA should further promote renewable energy and suggested that EPA allow all homes to use renewable energy to meet the requirements of the performance path. 	<ul style="list-style-type: none"> EPA appreciates efforts to promote renewable energy, but feels it is important to understand that the ENERGY STAR is the symbol for energy efficient performance, not the application of renewable energy systems. Therefore, the guidelines have been designed to primarily promote energy efficiency improvements in qualified homes. 	<ul style="list-style-type: none"> No policy change.
71	<ul style="list-style-type: none"> One respondent requested that EPA clarify whether the ENERGY STAR HERS Index Target should be calculated to the nearest decimal or the nearest whole number. 	<ul style="list-style-type: none"> EPA agrees that clarification of the precision of the ENERGY STAR HERS Index Target would be helpful. 	<ul style="list-style-type: none"> EPA has clarified in revised program guidelines that the ENERGY STAR HERS Index Target should be rounded to the nearest whole number.

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Benchmark Home & Size Adjustment Factor

ID	Comment Summary	EPA's Response	EPA's Policy Decision
General			
72	<ul style="list-style-type: none"> • Multiple respondents expressed general support for EPA's concept of adjusting requirements based on house size, with one respondent noting that large homes often have a larger budget with which to invest in improvements. 	<ul style="list-style-type: none"> • EPA appreciates support for the size adjustment factor. 	<ul style="list-style-type: none"> • No policy change.
73	<ul style="list-style-type: none"> • Several respondents suggested that setting more aggressive requirements for larger homes is counter-productive and beyond EPA's authority. The reasons provided for this opinion included: <ul style="list-style-type: none"> ○ Customers alone should determine the appropriate size of homes ; ○ House size is largely a function of zoning at the municipal level and driven by market demand; ○ Setting more aggressive requirements will only discourage builders of large homes from participating, thereby forfeiting any potential savings in homes with large energy consumption. 	<ul style="list-style-type: none"> • EPA does have the authority to define the ENERGY STAR new homes guidelines. ENERGY STAR is a voluntary rather than mandatory program; therefore, only partners that find value in complying with the guidelines need participate. • The primary goal of the ENERGY STAR program is to maximize carbon reductions through a voluntary market transformation program that labels high-quality energy-efficient homes, buildings, and products. EPA's proposed policy does not prohibit large homes from participating in the program, nor does it usurp the authority of other entities to determine market-appropriate house sizes. Rather, EPA recognizes that larger homes have the potential for greater absolute carbon reductions than smaller homes and has designed a policy that it believes will maximize overall program savings. 	<ul style="list-style-type: none"> • No policy change.
74	<ul style="list-style-type: none"> • Multiple respondents thought the Size Adjustment Factor concept was too burdensome or complicated to implement and one respondent questioned how the concept would be applied to CA's Title 24 energy budget paradigm. Multiple respondents believed that implementation would be time consuming and extremely difficult to verify. Several solutions to these issues were offered. These include: <ul style="list-style-type: none"> ○ For each benchmark home size, cap the energy budget and require that any larger house meet that cap with 	<ul style="list-style-type: none"> • Upon review of alternative suggestions to simplify the size adjustment factor, EPA has concluded that there is no clear demonstration of improved simplicity with the proposed alternatives. Moreover, EPA believes that respondents' concerns about undue complexity are not accurate. EPA's proposed size adjustment factor is easily determined through the selection of one value from a table and the use of a simple mathematical equation. In addition, EPA hopes that this factor will eventually be determined automatically within RESNET-accredited software programs. • EPA does agree with respondents that a custom solution will be needed for California because that state does not 	<ul style="list-style-type: none"> • No immediate policy change; however, EPA will pursue the development of customized guidelines for the state of CA.

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	<p>additional efficiency and/or on-site renewable energy.</p> <ul style="list-style-type: none"> ○ Per Florida Solar Energy Center (FSEC)'s suggestion, define a fixed HERS Index threshold based on house size and climate. 	<p>use RESNET-accredited software or the HERS Index.</p>	
75	<ul style="list-style-type: none"> • Even among respondents that were generally supportive, many provided suggestions for modifying the specifics of the proposal. Because the quantity of bedrooms determines the benchmark home size, multiple respondents suggested: <ul style="list-style-type: none"> ○ That EPA better define "bedroom" and associated terms; ○ Align EPA's and RESNET's definition, if logical; and be even more explicit about whether flex spaces (e.g., media rooms, office, or hobby room) should be counted as a bedroom.; ○ Because the presence of an "egress window" is a prerequisite for a bedroom, define this term. Consider using IRC Section 310; ○ Because conditioned floor area also plays a key role in the benchmark home concept, this term and "finished floor area" need to be further defined, especially with regards to attic kneewall spaces, cathedralized attics, and basements with insulated walls but no thermostat or intentional air distribution. 	<ul style="list-style-type: none"> • EPA agrees with respondents' concerns about the need to define the terms "bedroom" and "conditioned floor area" through alignment with the definitions used in the RESNET standards and to define the term "egress window". 	<ul style="list-style-type: none"> • EPA has updated the proposed guidelines to reference RESNET's definitions of "bedroom" and "conditioned floor area" and has defined the term "egress window".
<p>Definition of Benchmark Home Sizes</p>			
76	<ul style="list-style-type: none"> • Some respondents believe that the benchmark home sizes should be adjusted to be more representative of average home size or to promote more aggressive improvements for large homes. Specific suggestions included: <ul style="list-style-type: none"> ○ Align with the home sizes used in the LEED for Homes program. 	<ul style="list-style-type: none"> • EPA developed the proposed benchmark homes sizes using a combination of data and simplifications to achieve a workable policy. EPA understands that additional refinements may be needed in the future but is comfortable with the proposed policy as a first attempt to address the increased environmental impact of larger homes. However, EPA agrees it should monitor how the size adjustment factor continues to work and make any 	<ul style="list-style-type: none"> • No policy change. However, EPA will monitor the effectiveness and ease of implementation of the policy and make any necessary modifications in future guidelines.

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	<ul style="list-style-type: none"> ○ Create region-specific homes sizes to reflect local building practices. ○ Ensure that the data used from 2005 RECS to determine home sizes excludes homes built prior to 2000. ○ Align the home sizes with the actual average size by bedroom using construction data. ○ Solicit feedback from large builders to ensure that the proposed home sizes will allow for continued participation. ○ Define the benchmark for 8 or more bedrooms (per dwelling) at 5200 square feet, or limit the benchmark to 6 or more at 4000 square feet. ○ More narrowly define “bedroom” to exclude dens, libraries, or home offices so that large homes are not given an advantage, or adopt a more aggressive Size Adjustment Factor. 	<p>necessary modifications.</p>	
Calculation of Rated Home Size			
77	<ul style="list-style-type: none"> • Regarding methodology, one respondent requested that EPA clarify whether the rated home size should be calculated strictly using the applicable ANSI standards. 	<ul style="list-style-type: none"> • EPA agrees with the respondent that the methodology for calculating the conditioned floor area of the home needs be clarified. 	<ul style="list-style-type: none"> • EPA has updated the proposed guidelines to reference RESNET’s definition of “conditioned floor area”.
78	<ul style="list-style-type: none"> • Multiple respondents pointed out specific cases in which the proposed policy would discourage good building practices or lifestyles that result in a smaller carbon footprint. These scenarios and proposed improvements include: <ul style="list-style-type: none"> ○ Home offices. Families that work from home require a separate home-office, which is more energy-efficient than commuting to work but may result in increased efficiency requirements for the home. ○ Conditioned basements. Multiple respondents requested that EPA define the rated home size to only include above-grade floor area or finished floor area, rather than 	<ul style="list-style-type: none"> • EPA has reviewed concerns about the size adjustment factor and concluded the following: <ul style="list-style-type: none"> ○ Most home offices will not impose any extra energy efficiency burden because they will be counted as a bedroom under RESNET’s definition, ○ Conditioned basements and crawl spaces should count towards the total square footage because they impose additional space conditioning requirements, ○ Mechanical rooms will add to total conditioned floor area, but will typically not be so large as to significantly impact the required ENERGY STAR HERS Index Target, ○ The additional conditioned floor area required for homes with special-needs occupants will typically not be so large as to significantly impact 	<ul style="list-style-type: none"> • No policy change.

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	<p>conditioned floor area. With the currently proposed definition, homes with conditioned basements will be penalized, despite the fact that increasing conditioned floor by adding a basement is a very energy-efficient design strategy.</p> <ul style="list-style-type: none"> ○ Conditioned crawlspaces. From a building science perspective, sealed conditioned crawlspaces are generally preferred over vented unconditioned crawlspaces. If this conditioned area of the crawlspace is included in the rated home size, it will discourage use of this foundation type. ○ Mechanical rooms that accommodate ductwork and air handling units in conditioned space. Respondents request that EPA exclude mechanical rooms from the total conditioned floor area for the purposes of determining the Size Adjustment Factor. ○ Homes designed for special-needs occupants. Homes that include extra floor area, such as treatment rooms and wider hallways for handicapped or special-needs occupants, should be provided an exemption for the added floor area. As currently proposed, the respondent suggested that the policy may not comply with ADA. 	<p>the required ENERGY STAR HERS Index Target. Even under scenarios where the stringency is increased, homes may still participate in the program but must include additional energy features or renewable energy to compensate, just as other larger homes must do.</p>	
<p>Calculation of Size Adjustment Factor</p>			
79	<ul style="list-style-type: none"> • Multiple respondents suggested that the exponent used to calculate the Size Adjustment Factor be modified to either benefit small homes or to require additional improvements for large homes. Specific proposals included: <ul style="list-style-type: none"> ○ Encourage the development of smaller homes by not capping the 	<ul style="list-style-type: none"> • Under the current guidelines, small homes typically achieve a worse (i.e., higher) HERS index than large homes with the same energy efficiency features. EPA's proposed new guidelines attempt to eliminate this penalty using the new performance path definition. However, EPA intentionally has chosen not to provide additional credit for small homes, because it needs to ensure that even small ENERGY STAR qualified homes 	<ul style="list-style-type: none"> • No policy change.

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	<p>Size Adjustment Factor at 1.0. As currently proposed, this cap arbitrarily provides no credit for small homes that use fewer resources.</p> <ul style="list-style-type: none"> ○ Further increase the stringency for large home by increasing the exponent from 0.25 to a value between 0.50 and 0.85. ○ Allow local program sponsors some flexibility to set a more stringent Size Adjustment Factor. 	<p>provide meaningful savings relative to non-qualified small homes.</p> <ul style="list-style-type: none"> ● EPA understands the desire of some respondents to further increase the stringency of the Size Adjustment Factor for larger homes and realizes that additional refinements may be needed in the future. However, EPA is comfortable with the proposed policy as a first attempt to address the increased environmental impact of larger homes. ● EPA has allowed and will continue to allow local program sponsors to require additional requirements that exceed the national guidelines for participants in their local program.
Rules for Meeting the ENERGY STAR HERS Index Target		
80	<ul style="list-style-type: none"> ● Some respondents would like to see EPA take a more aggressive approach to bring the energy efficiency or carbon footprint of larger homes closer to that of their smaller counterparts. Specific comments included: <ul style="list-style-type: none"> ○ Require larger homes to adopt on-site power generation. ○ Require that larger homes only be allowed to comply using energy efficiency measures; not by adding renewable sources of energy. 	<ul style="list-style-type: none"> ● EPA analysis indicates that with the size adjustment factor, very large homes will have difficulty earning the ENERGY STAR without the use of renewable energy systems. Therefore, while the ENERGY STAR program primarily promotes efficiency, EPA feels that the allowance of renewable energy under these scenarios is an appropriate compromise to allow large homes to continue to partner with the ENERGY STAR program.
		<ul style="list-style-type: none"> ● No policy change.

Envelope

ID	Comment Summary	EPA's Response	EPA's Policy Decision
81	<ul style="list-style-type: none"> ● One respondent noted that raised-heel trusses will be required for homes in climate zones 1 through 3 in order to provide the required airspace between the radiant barrier and insulation. 	<ul style="list-style-type: none"> ● The intent of this requirement, which applies to all climate zones, is to provide adequate space to allow for effective insulation throughout the attic. The additional prescriptive requirement for radiant barriers in climate zones 1 through 3 for homes with ducts in unconditioned attics should not significantly impact this requirement, because the thickness of radiant barriers is negligible. 	<ul style="list-style-type: none"> ● No policy change regarding the need for adequate space to insulate attic edges in all climates. However, EPA has clarified the requirement in the proposed guidelines as follows: "raised-heel trusses or equivalent framing techniques shall elevate the roof adequately to allow for insulation at a depth of at least 75% of full insulation level used throughout the rest of the attic".

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82	<ul style="list-style-type: none"> • A respondent stated that radiant barriers should not be mandatory because their long-term performance is not proven and requested that an alternative compliance option be allowed in the prescriptive path. • On that note, respondents requested a number of alternative means of compliance, including: <ul style="list-style-type: none"> ○ Products approved by the Cool Roof Rating Council; ○ ENERGY STAR qualified roof products ; ○ A continuous ¾” airspace between the roof decking and a solid sheathing surface below, which is allowed by California’s Title 24 energy code, by the ICC National Green Building Standard, and is supported by research at Oak Ridge National Laboratory; ○ And/or products embedded with titanium dioxide. 	<ul style="list-style-type: none"> • EPA research from highly credible sources continues to support the value of radiant barriers in hot climates with ducts in the attic. Moreover, radiant barriers are not mandatory, but instead are specified in the ENERGY STAR Reference Design and can be traded off against other measures under the Performance Path. • EPA agrees with respondents that ENERGY STAR qualified roof products, which encompass those approved by the Cool Roof Rating Council and products that utilize titanium dioxide, can be an effective alternate to radiant barriers. • While the use of a ¾” airspace above the roof decking does also appear to be a successful strategy for reducing radiant gains, EPA research did not reveal the availability of standards that would allow for the successful implementation of this detail on a consistent basis. 	<ul style="list-style-type: none"> • No policy change regarding the specification of a radiant barrier in the ENERGY STAR Reference Design. However, for the prescriptive path, ENERGY STAR qualified roof products were added as an acceptable alternate to the use of radiant barriers.
83	<ul style="list-style-type: none"> • One respondent suggested that radiant barriers should be required in all unconditioned attics in climate zones 1 through 3, regardless of the amount of ducts in the attic, while another respondent suggested that high-performance roof coatings should be required in all homes in climate zones 4 through 8. 	<ul style="list-style-type: none"> • EPA believes that the proposed guidelines will achieve meaningful savings in all climates without the need to require radiant barriers in all homes in climate zones 1 through 3 or high-performance roof coatings for all homes in climate zones 4 through 8. However these improvements will be considered for future iterations of the guidelines. 	<ul style="list-style-type: none"> • No policy change.
84	<ul style="list-style-type: none"> • One respondent suggested that required insulation should be increased to the levels recommended by DOE, as this component of the home is difficult to modify after completion of the home, can be improved cost-effectively and without design changes, and savings are easily documented. • One respondent suggested that attic insulation levels should be increased beyond R-38 in mixed climates. 	<ul style="list-style-type: none"> • EPA has considered the requirement for additional insulation, but feels that the proposed guidelines’ use of 2009 IECC insulation levels will allow EPA to achieve its goal of meaningful and cost-effective savings. However, EPA notes that partners using the performance path can utilize the higher levels of insulation recommended by DOE. 	<ul style="list-style-type: none"> • No policy change.
85	<ul style="list-style-type: none"> • On the topic of windows: <ul style="list-style-type: none"> ○ One respondent requested that ENERGY STAR windows be 	<ul style="list-style-type: none"> • EPA agrees with respondents that a minimum level of window performance needs to be integrated into the program requirements to help ensure an effective 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to: <ul style="list-style-type: none"> ○ Require that windows

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	<p>mandatory in all homes to ensure comfort and because of the long lifetime of windows.</p> <ul style="list-style-type: none"> ○ Another requested that high SHGC values be allowed in the prescriptive path for homes with passive solar designs. ○ One respondent requested that EPA clarify whether the adjustments for homes with more than 18% window to floor area ratios, noted in footnote 14, apply to both the prescriptive and performance path. ○ Another noted that EPA should change the phrase in footnote 14b to read “maximum allowed U-value” instead of “minimum required U-value”. ○ One respondent noted the concern that where high-impact glass is required by code, it may not be available at required SHGC specification. 	<p>thermal enclosure system in every home.</p> <ul style="list-style-type: none"> • EPA agrees with respondents that high SHGC values should be allowed for the use of passive designs, but doesn’t believe that the window efficiency levels that have been proposed will conflict. • EPA agrees with respondents that the footnotes relating to window adjustments need to be clarified. • Regarding code concerns, EPA’s current guidelines already state that in cases where a local code requirement conflicts with the guidelines, the local code requirement shall be met instead of the requirement in the guidelines. This allowance will be maintained in the new guidelines. 	<p>meet or exceed the 2009 IECC in the performance path and meet or exceed the ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 for the prescriptive path,</p> <ul style="list-style-type: none"> ○ Clarify that the window adjustments in the footnote are only applicable to the prescriptive path, though these adjustments now apply to homes with greater than 15% window to floor area ratio, rather than 18%. ○ Correct the phrase in the footnote on window adjustments to state that the ENERGY STAR SHGC and ENERGY STAR U-value should match “the value specified in the ENERGY STAR Reference Design for a home in the same climate as the rated home”.
86	<ul style="list-style-type: none"> • Regarding infiltration: <ul style="list-style-type: none"> ○ One respondent commented that the levels are too lenient in cold climates and that 3 ACH50 is commonly achieved today, especially when utilizing the Thermal Bypass Inspection checklist. ○ One respondent requested that infiltration requirements should relate to the total volume of the house because smaller homes have a harder time meeting infiltration 	<ul style="list-style-type: none"> • EPA agrees with respondents that tighter infiltration levels are achievable and appropriate given that some of the originally proposed efficiency measures (e.g., efficient hot water distribution system, low-flow showerheads) have been removed. • EPA has not proposed mandatory infiltration requirements. Therefore, homes that have difficulty achieving the infiltration levels dictated in the prescriptive path can use the performance path instead and utilize other efficiency measures to compensate. However, note that the mandatory Thermal Enclosure System checklist will require visual verification of the 	<ul style="list-style-type: none"> • EPA has revised the guidelines to reduce the originally proposed infiltration levels by 1 ACH50 in all climates. • EPA has added the most critical air sealing details identified by building science experts to the mandatory Thermal Enclosure System.

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	<p>requirements than large boxy homes.</p> <ul style="list-style-type: none"> ○ One respondent requested that EPA should allow for additional test methodologies beyond what's allowed by RESNET, such as ASTM-equivalent methodologies. 	<p>most critical air sealing details identified by building science experts for all qualified homes.</p> <ul style="list-style-type: none"> ● EPA defers to RESNET on assessing the acceptability of testing protocols. If respondents feel that ASTM-equivalent methodologies should be permissible, EPA recommends that they address this issue directly with RESNET. 	
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Thermal Enclosure System Rater Checklist

ID	Comment Summary	EPA's Response	EPA's Policy Decision
87	<ul style="list-style-type: none"> ● Regarding sealing the sheetrock to the top plate at attic/wall interfaces, a large number of respondents felt it was infeasible or even impossible to verify since it cannot be seen once the drywall is installed. ● Others worried about cost and passive resistance from sheetrock installers who, it was noted, are often paid by the sheet and may oppose a measure that would slow them down. ● One respondent stated the opinion that it was unnecessary in already tight homes. ● Because of these concerns, respondents requested the requirement be eliminated, or an alternative compliance option be added that consists of a pressure zone test across the ceiling and attic showing a minimum pressure differential of 50 Pascals. 	<ul style="list-style-type: none"> ● EPA agrees with respondents that it may be difficult for HERS raters to verify the air sealing of sheetrock to the top plate, but recommends that raters work with builders to verify this item where that is the case. ● EPA research with infrared camera diagnostics reveals a prevalent problem with this detail and cannot allow sheetrock contractor resistance to compromise the ENERGY STAR label. 	<ul style="list-style-type: none"> ● No policy change.
88	<ul style="list-style-type: none"> ● Another area of concern was the requirement for Grade I insulation. Respondents felt it was very difficult to achieve this using fiberglass batts, and worried it would effectively require wet-applied cellulose or foam. ● Respondents also noted a specific concern about achieving Grade I at rim joists. If required, some worried that raters would end up blurring the definition of Grade I to make it more lenient. ● As solutions, respondents suggested an exception if continuous exterior insulation is 	<ul style="list-style-type: none"> ● EPA acknowledges that some types of insulation may have greater difficulty meeting Grade I requirements and that a compliance option that would allow Grade II insulation without compromising the integrity of the thermal enclosure system should be allowed. ● EPA hopes to work with utility sponsors to increase quality assurance procedures to help ensure that all requirements, especially difficult details such as insulation installation at rim/band joists, are enforced. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by adding an allowance for Grade II cavity insulation if continuous insulated sheathing is used that meets or exceeds the following insulation levels: <ul style="list-style-type: none"> ○ R-3 in Climate Zones 1 to 3; ○ R-6 in Zones 4 to 6; and, ○ R-10 in Zones 7 and 8

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	used or allowing Grade II insulation as long as the modeling penalty is applied.		
89	<ul style="list-style-type: none"> Regarding the four allowed builder-verified items, several respondents felt this would be difficult to achieve. In particular, one respondent noted that he usually has the builder sign-off on item 1.4 (slab insulation), 5.4 (airtight light fixtures), and 4.2 (piping penetrations insulated). In addition, the respondent argues that it is necessary for the builder to sign-off on 2.2 (insulation behind fireplaces), 2.7 (staircase wall insulation) and 2.8 (double wall insulation) if the drywaller is also the one installing the air barrier. The respondent feared that if only four allowances were given the rater would end up certifying items they could not fully verify and stated they would prefer the rater to verify fewer items but do so responsibly. 	<ul style="list-style-type: none"> EPA agrees that the number of builder-verified items should be increased for the Thermal Enclosure System Rater checklist, especially in light of the integration of the reduced thermal bridging requirements into this checklist. 	<ul style="list-style-type: none"> EPA has revised the proposed Thermal Enclosure System Rater checklist to increase the number of allowances for builder-verified items from four to eight.
90	<ul style="list-style-type: none"> There were a number of other areas where respondents requested more lenient requirements. These included suggestions: <ul style="list-style-type: none"> To not require an air barrier in basements and crawlspaces in climate zones 4 and higher; That slab insulation be recommended but not required until the practices become more widespread; To not require airtight recessed lighting fixtures in houses with cathedralized attics, lest the efficiency of CFLs be reduced. 	<ul style="list-style-type: none"> EPA has reviewed respondents' concerns and notes the following: <ul style="list-style-type: none"> EPA analysis indicates that air barriers for below-grade walls are just as important as above-grade to prevent air circulation caused by the mechanical system and from infiltration through above-grade segments of the walls. Respondent did not provide suitable justification for excluding these air barriers. While EPA appreciates that some markets will need to evolve to meet the slab insulation requirement, EPA also believes that basic building science confirms that slab insulation is critical for comfort and energy efficiency. Respondent did not provide suitable justification for excluding slab insulation in cold climates where the thermal enclosure system would be compromised by its omission. EPA research indicates that CFL efficiency will not be reduced where ICAT fixtures are used in cathedral ceilings. Respondent did not provide suitable justification for excluding this requirement from the guidelines. 	<ul style="list-style-type: none"> No policy change.

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91	<ul style="list-style-type: none"> • There were also calls for some additional or more stringent requirements. These included requests that EPA: <ul style="list-style-type: none"> ○ Require hurricane straps be screwed to the top of the top plate rather than the side; ○ Prohibit ducts in cantilevered floors to ensure enough room for full insulation; ○ Require blown-in insulation in attics be covered by 1 to 2 mil of visqueen; ○ Prohibit inset stapling as it almost assures Grade II insulation; ○ Specify that bath fans and duct boots must also be sealed to drywall in addition to whole house fans and recessed lighting fixtures. 	<ul style="list-style-type: none"> • EPA has reviewed respondents' concerns and notes the following: <ul style="list-style-type: none"> ○ EPA believes it is not appropriate for ENERGY STAR to require isolated structural integrity details, such as where to fasten hurricane straps, and instead will defer to local codes to assess applicability, ○ Based on current research and EPA's current understanding, it is not clear that the addition of a plastic cover on the top of attic insulation will be cost-effective and result in a meaningful increase in savings, ○ EPA defers to RESNET's definition for Grade I insulation standards, which does not prohibit the use of inset stapling, though EPA agrees with respondents that great effort will be required to achieve Grade I with this practice. ○ EPA agrees with respondent that sealing bath fans and duct boots is an appropriate addition for the guidelines. 	<ul style="list-style-type: none"> • No policy change except for the addition of a new requirement to the HVAC System Quality Installation Rater checklist to seal exhaust fans and duct boots to floor, walls, or ceiling using caulk, foam, or mastic.
92	<ul style="list-style-type: none"> • A respondent requested clarification as to whether gaskets are an acceptable method to seal recessed lighting fixtures. 	<ul style="list-style-type: none"> • Gaskets have been and will continue to be an acceptable means of sealing recessed light fixtures. 	<ul style="list-style-type: none"> • No policy change.
93	<ul style="list-style-type: none"> • A respondent wondered whether construction adhesive applied as sheetrock is installed would satisfy requirement for top-plate sealing or whether caulk is mandatory. 	<ul style="list-style-type: none"> • The sealing of sheetrock to the top plate at attic/ceiling interface shall be completed using a silicone, latex foam, or equivalent air sealing material. Sheetrock construction adhesives shall not be used to comply with this measure. 	<ul style="list-style-type: none"> • EPA has revised proposed guidelines to specify that silicone, latex foam, or equivalent air sealing material shall be used to seal sheetrock to top plate at attic/ceiling interface.
94	<ul style="list-style-type: none"> • There were two concerns that requirements could conflict with fire codes. <ul style="list-style-type: none"> ○ First, a respondent stated that fire codes often do not allow air sealing of common walls. ○ Second, a different respondent stated that some fire codes prohibit spray-foam insulation around sprinkler piping. • Because of these issues it was suggested the EPA add a disclaimer that fire codes are to supersede any requirements in the program. 	<ul style="list-style-type: none"> • EPA's current guidelines already state that in cases where a local code requirement conflicts with the guidelines, the local code requirement shall be met instead of the requirement in the guidelines. This allowance will be maintained in the new guidelines. 	<ul style="list-style-type: none"> • No policy change, though EPA has clarified its guidance in the proposed guidelines regarding situations where local codes overlap with EPA's requirements. In brief, local code requirements shall continue to take precedence over the requirements of EPA's guidelines.

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95	<ul style="list-style-type: none"> One respondent suggested that EPA require wind baffles at every bay, not just at soffit vent locations. 	<ul style="list-style-type: none"> EPA agrees with respondent that wind baffles should be included at every bay where vents or leakage exists and exposed ceiling insulation is present. 	<ul style="list-style-type: none"> EPA has revised the Thermal Enclosure System Rater checklist to clarify that wind baffles shall be installed at eaves in every bay for attics with exposed ceiling insulation.
96	<ul style="list-style-type: none"> Several respondents provided specific recommendations for edits, including the following: <ul style="list-style-type: none"> One respondent noted that there are currently two items listed as "1.4": attic eave baffles and slab edge insulation. Another suggested changing the wording of footnote 5 from "...recommended but not required in Climate Zones 4 and higher.." to "...recommended in climate zones 4 and higher, but not required.." to improve clarity. 	<ul style="list-style-type: none"> EPA agrees with the edits proposed by the respondents. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to ensure proper numbering and to clarify the guidance on air barriers at rim joists.

Quality Framing Checklist

ID	Comment Summary	EPA's Response	EPA's Policy Decision
General			
97	<ul style="list-style-type: none"> One respondent suggested that the checklist be offered as best practices rather than mandatory requirements Several respondents felt that the checklists consisted of good construction practices, but had minimal energy impact. 	<ul style="list-style-type: none"> EPA analysis and review of infrared diagnostics reveals that thermal bridging impacts both efficiency and comfort of homes. Furthermore, the practices required by the checklist can be met cost-effectively. The respondents' concerns do not effectively refute these findings. 	<ul style="list-style-type: none"> No policy change regarding the inclusion of reduced thermal bridging techniques as mandatory requirements.
98	<ul style="list-style-type: none"> One respondent suggested that the checklist be renamed 'Efficient' framing rather than 'Quality' framing, as it deals only with energy concerns rather than structural issues. 	<ul style="list-style-type: none"> EPA agrees with respondent that the name of the checklist should be improved. EPA believes that the requirements of the Quality Framing checklist and the requirements of the current Thermal Bypass Checklist have been designed to help ensure a complete thermal enclosure system. Therefore these two checklists have been eliminated and the requirements relocated to the new Thermal Enclosure System Rater checklist. 	<ul style="list-style-type: none"> EPA has eliminated the stand-alone Quality Framing checklist and, instead, relocated these requirements and those of the current Thermal Bypass checklist to a new Thermal Enclosure System Rater checklist.

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99	<ul style="list-style-type: none"> One particular concern among respondents was how the checklist was to be implemented by raters who may be unfamiliar with structural requirements of buildings, and how they should interact with homebuilders and building inspectors. 	<ul style="list-style-type: none"> EPA is not requiring raters to assess or alter the structural integrity of the home. Rather, raters shall simply determine compliance by confirming that particular details have been used and by assessing the amount of framing in the home that has no apparent or documented structural purpose. 	<ul style="list-style-type: none"> EPA has clarified that raters need not direct builders to remove framing, but instead shall simply determine compliance by confirming that particular details have been used and by assessing the amount of framing in the home that has no apparent or documented structural purpose.
100	<ul style="list-style-type: none"> Regarding corner insulation, a respondent requested clarification on whether 3-stud corners would be sufficient. 	<ul style="list-style-type: none"> EPA will allow 3-stud corners to be used as a means to meet the requirement that all corners be insulated to the end. 	<ul style="list-style-type: none"> EPA has clarified the proposed guidelines to indicate that 3-stud corners are acceptable for compliance.
101	<ul style="list-style-type: none"> A respondent also asked for further explanation of the continuous insulation requirement for double walls, being unclear whether the entire cavity is required to be filled, or whether the insulation is simply required to be secured to the outside surface of the wall. 	<ul style="list-style-type: none"> EPA requires that the entire cavity be filled with insulation and that the interior studs and exterior studs be offset so that insulation can be used to prevent any thermal bypasses. 	<ul style="list-style-type: none"> No policy change; however, EPA has clarified the requirements to ensure that the entire cavity will be filled and that the interior and exterior studs will be offset.
102	<ul style="list-style-type: none"> One respondent suggested that steel-framed walls should be required to use exterior rigid insulation to prevent thermal bridging. 	<ul style="list-style-type: none"> EPA agrees with respondent that steel-framed walls should be required to use exterior rigid insulation to prevent thermal bridging. 	<ul style="list-style-type: none"> EPA has added a requirement within the new proposed Thermal Enclosure System Rater checklist that steel-framed walls must use continuous insulated sheathing at the following levels to comply: <ul style="list-style-type: none"> ≥ R-3 in Climate Zones 1 to 3; ≥ R-6 in Zones 4 to 6; ≥ R-10 in Zones 7 and 8
<i>Raised-Heel Truss & Attic Platform</i>			
103	<ul style="list-style-type: none"> Another major concern expressed by respondents was over the height impacts of requiring a raised heel truss. <ul style="list-style-type: none"> Five respondents had concern with the impact on height, typically citing situations where local zoning requirements imposed height restrictions One respondent noted, "certain 	<ul style="list-style-type: none"> EPA's review of this requirement indicates that it will only increase house height by approximately 8-12 inches. It is not clear to EPA that this small increase will create a widespread hardship for homebuilders. Furthermore, EPA has observed raised heel trusses or equivalent framing techniques being used successfully across many markets and all builder types. 	<ul style="list-style-type: none"> No policy change.

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	narrow lot developments and home designs are not conducive to the use of raised heel trusses.”		
104	<ul style="list-style-type: none"> Regarding the ‘full-depth’ requirement, respondents had concerns about high R-value attic insulation requiring a particularly high raised-heel truss. One suggested changing the requirement to a specified depth that provides adequate – but likely not full depth – insulation at the roof edge. Eight inches was suggested as an appropriate number. 	<ul style="list-style-type: none"> EPA agrees with respondents that near-full-depth insulation should be sufficient to meet EPA’s goal of ensuring a complete thermal enclosure system. Because the required depth of insulation will vary by insulation type and climate, EPA prefers to define the requirement in terms of its intent and allow the rater and builder partners to translate this into the height required for each home. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to clarify the requirement as follows: “Raised-heel trusses or equivalent framing techniques shall elevate the roof adequately to allow for insulation at a depth of at least 75% of full insulation level used throughout the rest of the attic.”
105	<ul style="list-style-type: none"> Respondents submitted the following requests relating to raised heel trusses: <ul style="list-style-type: none"> Multiple respondents requested an option to use stick-built roofs in addition to prebuilt trusses. Two respondents suggested adding wording to allow builders to use a raised-heel truss “or otherwise provide for full R-value to the outside edge of exterior walls.” One respondent requested proper fastening methods be documented for a raised roof rafter with conventional framing. One respondent noted that they have encountered numerous homes that provide for full-depth insulation without the use of a raised heel truss. 	<ul style="list-style-type: none"> EPA agrees with the respondents that the requirements should be clarified to allow equivalent framing techniques. EPA believes it is not appropriate for ENERGY STAR to require isolated structural integrity details, such as proper fastening methods for raised roof rafters and instead will defer to local codes. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to clarify the requirement as follows: “Raised-heel trusses or equivalent framing techniques shall elevate the roof adequately to allow for insulation at a depth of at least 75% of full insulation level used throughout the rest of the attic.”
106	<ul style="list-style-type: none"> Several respondents requested the requirement for raised heel trusses be eliminated altogether. One respondent suggested it be moved to the Reference Design scenario. Two others requested that the specification allow for trade-offs so builders can decide if they can more cost-effectively improve the energy efficiency of the home in other areas. One respondent suggested an exception for locations where zoning ordinances and the raised heel truss requirement would force 	<ul style="list-style-type: none"> EPA’s objective with the proposed guidelines is to recognize high-quality energy efficient homes that offer meaningful energy savings, a complete thermal enclosure system, quality installed HVAC systems, and a water management system. Research and field-experience validate the importance of raised-heel trusses in achieving a complete thermal enclosure system. Furthermore, EPA has observed raised heel trusses or equivalent framing techniques being used successfully across many markets and all builder types. 	<ul style="list-style-type: none"> No policy change.

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	interior ceiling height below a certain (acceptable) level.		
107	<ul style="list-style-type: none"> One respondent asked if a raised heel truss will mean that baffles are no longer needed. 	<ul style="list-style-type: none"> Baffles serve to channel air from an attic eave above the ceiling insulation to help ensure the thermal integrity of the attic insulation. This need will not change with the presence of a raised heel truss or equivalent framing techniques. 	<ul style="list-style-type: none"> No policy change.
108	<ul style="list-style-type: none"> One respondent expressed concern that the requirement conflicted with the credit provided for the raised heel truss methods used in the IECC, which allows for lower attic R-values when raised heel trusses are used. 	<ul style="list-style-type: none"> EPA's ENERGY STAR program is a voluntary above-code program. In this instance, the requirement for a raised heel truss does not conflict, but does exceed, the code-minimum requirements of the IECC. 	<ul style="list-style-type: none"> No policy change.
109	<ul style="list-style-type: none"> One respondent stated that the requirement is unnecessary in climate zones 1-3. 	<ul style="list-style-type: none"> EPA believes a complete thermal enclosure system is necessary in all climates. However, the requirement has been clarified such that a raised heel truss is not required if alternate framing techniques can be used to ensure this intent. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to clarify the requirement as follows: "Raised-heel trusses or equivalent framing techniques shall elevate the roof adequately to allow for insulation at a depth of at least 75% of full insulation level used throughout the rest of the attic."
110	<ul style="list-style-type: none"> A respondent requested that EPA specify the required roof truss heel height and HVAC platform height for various R-values to make requirements easier to convey to builders. 	<ul style="list-style-type: none"> Because the required depth of insulation will vary by insulation type and climate, EPA prefers to define the requirement in terms of its intent and allow the rater and builder partners to translate this into the height required for each home. EPA also believes that specific heights need not be specified for the HVAC platform or other platforms in the attic. Raters can assess compliance by visually inspecting beneath the platform to ensure that the insulation is not compressed. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to clarify the requirement as follows: "Raised-heel trusses or equivalent framing techniques shall elevate the roof adequately to allow for insulation at a depth of at least 75% of full insulation level used throughout the rest of the attic." No policy change regarding attic platforms.
111	<ul style="list-style-type: none"> One respondent had concern over the requirement for the raised HVAC air handler, suggesting that locating air handlers in attic space should be discouraged. One respondent requested wording in footnote 2 adding "or otherwise provide for full R-value of insulation." One respondent had concern over whether a rater could verify that insulation was installed under the platform, and asked if builders 	<ul style="list-style-type: none"> While EPA agrees with respondent that locating air handlers in the attic should be discouraged, this is common practice in many areas of the country and cannot be prohibited at this time as part of an effective voluntary market-transformation program. Research and field-experience validate that where platforms are present in the attic, it is important to raise them to achieve a complete thermal enclosure system. Furthermore, this requirement can be easily and inexpensively met using scrap framing to raise the 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to require that all platforms in the attic, and not just HVAC platforms, be raised to ensure full-depth insulation underneath.

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	<p>would be required to use one of the four allowed builder-verifications for this.</p> <ul style="list-style-type: none"> • One respondent asked why a penalty for not having a raised HVAC penalty was not allowed as a trade-off. • One respondent suggested that all attic platforms should be raised to allow full-depth insulation, not just platforms for HVAC equipment. 	<p>platforms or by coordinating with truss manufacturers to build-in thicker members where needed. For these reasons, EPA has made this requirement mandatory.</p> <ul style="list-style-type: none"> • EPA believes that raters can easily assess compliance with this requirement through a visual inspection. However, at the rater's discretion, a builder could verify this item using one of the allowances. 	
Exterior Above-Grade Walls & OVE Options			
112	<ul style="list-style-type: none"> • Many respondents expressed concern over the options available for exterior above-grade wall construction: <ul style="list-style-type: none"> ○ Some respondents felt the options were too limited. Specifically, several respondents noted that in areas with stringent wind load standards, some provisions of the OVE option can't be done, and that requiring one of the remaining four options for all homes seems unreasonable. ○ Two respondents noted the lack of an alternative to use conventional framing with a thicker wall cavity. 	<ul style="list-style-type: none"> • EPA would welcome suggestions for additional techniques that will achieve its goal of ensuring a complete thermal enclosure system for qualified homes under the proposed guidelines. However, research of best practices by the nation's building science experts indicates that wrapping homes with rigid insulated sheathing remains a highly cost-effective means for achieving this goal where code officials require structural details that prevent OVE framing. • EPA has not included an option for conventional wall framing with a thicker cavity because this configuration will not reduce the framing fraction within the wall, which is the source of the thermal bridging that EPA desires to reduce. 	<ul style="list-style-type: none"> • No policy change.
113	<ul style="list-style-type: none"> • One respondent noted there was no mention of framing fractions and their importance. 	<ul style="list-style-type: none"> • Based on internal discussions and feedback from experts, it was felt that field verification of a percent framing factor would be too difficult to enforce. As a result, a prescriptive approach to OVE that ensures substantially reduced framing was used instead. 	<ul style="list-style-type: none"> • No policy change.
114	<ul style="list-style-type: none"> • One respondent requested that EPA also allow the use of insulated siding. 	<ul style="list-style-type: none"> • EPA agrees with the respondent that insulated siding would meet the intent of the checklist if it provides the required R-value and is installed flush with the exterior sheathing. 	<ul style="list-style-type: none"> • EPA has clarified this requirement in the proposed guidelines as follows: "Insulated siding shall meet this requirement as long as it provides the required R-value and is installed flush with the exterior sheathing."
115	<ul style="list-style-type: none"> • One respondent requested clarification on how the Quality Framing checklist will address gut rehab renovations attempting to earn the ENERGY STAR for new homes. 	<ul style="list-style-type: none"> • EPA's program is designed with new homes in mind and therefore does not directly address gut rehab projects. However, where a gut rehab project can comply with all of the requirements of the guidelines, 	<ul style="list-style-type: none"> • No policy change.

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		then it is also eligible to earn the ENERGY STAR.	
116	<ul style="list-style-type: none"> One respondent expressed concern that the Quality Framing checklist interferes with structural, architectural design, and other critical variables generally. 	<ul style="list-style-type: none"> EPA is not requiring raters to assess or alter the structural integrity of the home. Rather, raters shall simply determine compliance by confirming that particular details have been used and by assessing the amount of framing in the home that has no apparent or documented structural purpose. The key for successful compliance will be to educate the builder partner in advance about the requirements of the checklist so that he or she can work with the appropriate parties to make necessary changes to the design and construction process. 	<ul style="list-style-type: none"> EPA has clarified that raters need not direct builders to remove framing, but instead shall simply determine compliance by confirming that particular details have been used and by assessing the amount of framing in the home that has no apparent or documented structural purpose.
117	<ul style="list-style-type: none"> One respondent expressed concern that if the 2009 IECC is amended to not require 2X6 construction when adopted, builders required to use 2X6 construction for ENERGY STAR compliance will have difficulty being competitive. 	<ul style="list-style-type: none"> EPA notes that the 2009 IECC does not require the depth of framing, only the R-value and equivalent U-value of the insulated assembly. Builders may use 2X4 framing with insulated sheathing to meet required insulation levels, if desired. 	<ul style="list-style-type: none"> No policy change.
118	<ul style="list-style-type: none"> Several respondents had concerns that building inspectors would not allow some of the advanced framing methods in section 2.1. There was particular concern about this for the requirement of the use of “California Corners” in section 2.1.1. From a practical perspective, one respondent noted that their use won’t allow for a nailer for siding. Another respondent was concerned over conflict with the 2006 and 2009 IRC when insulated sheathing is used. However, because EPA is not proposing that California Corners be required when insulated sheathing is used, it is possible that there was confusion over the checklist requirement. One respondent asked if three-stud corners were in compliance with requirement 2.1.1. A final respondent asked for further clarification of “equivalent alternatives” to California Corners. Another respondent asked if structural sheathing was allowed at the corners. One respondent expressed concern over the 	<ul style="list-style-type: none"> As always, local code requirements supersede ENERGY STAR guidelines. In addition, EPA has provided a variety of options for compliance with the checklist and therefore believes that builders will be able to select one that is in compliance with local codes. EPA will allow 3-stud corners to be used as a means to meet the requirement that all corners be insulated to the end. EPA notes that two and three-stud corners have been used successfully by builders and should not present any problems regarding the installation of siding that cannot be overcome. EPA will be providing additional guidance on this checklist and all other new checklists through guidebooks, such as the one that was created for the Thermal Bypass checklist, to assist partners with compliance. This will detail some of the equivalent alternatives that are available to partners. In addition, EPA states on the first page of the checklists that alternative methods of meeting the checklist requirements may be used if the Provider deems them to be equivalent to or more stringent than the checklist guidelines. However, EPA has added a requirement in the inspection checklist document that Providers submit these “equivalent” determinations to 	<ul style="list-style-type: none"> EPA has clarified the proposed guidelines to indicate that 3-stud corners are acceptable for compliance. In addition, Providers are still empowered to make determinations on equivalent measures, though EPA has added a requirement in the inspection checklist document that Providers submit these “equivalent” determinations to EPA for review.

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	OVE option with respect to code requirements on lateral bracing needs.	EPA for review to ensure consistent enforcement of the guidelines.	
119	<ul style="list-style-type: none"> • Several respondents had concern over provision 2.1.5 – “Unnecessary studs have been eliminated.”: <ul style="list-style-type: none"> ○ Several respondents wanted to know who would define unnecessary, while some expressed concern over raters being charged with evaluating structural necessity. ○ One respondent asked for clarification on how many ‘unnecessary’ studs would disqualify a home. 	<ul style="list-style-type: none"> • EPA is not requiring raters to assess or alter the structural integrity of the home. Rather, raters shall simply determine compliance by assessing the amount of framing in the home that has no apparent or documented structural purpose and ensuring that the amount does not exceed the 5% limit. 	<ul style="list-style-type: none"> • EPA has clarified this requirement in the proposed guidelines as follows: “Vertical framing members shall either be on-center or have an alternative structural purpose that is apparent to the rater or documented by the builder, architect or engineer. No more than 5% of studs may lack an apparent or documented structural purpose, which is equivalent to one vertical stud for every 30 linear feet of wall, assuming 16” stud spacing.”
120	<ul style="list-style-type: none"> • Several respondents had concern over the existence of marriage walls in the construction of modular and panelized homes and whether these wall types would be allowed under the text of Footnote 7. 	<ul style="list-style-type: none"> • Marriage walls serve a structural purpose in the construction of the home and therefore would not count towards the limitation on studs without an apparent or document structural purpose. 	<ul style="list-style-type: none"> • EPA has clarified this requirement in the proposed guidelines as follows: “Vertical framing members shall either be on-center or have an alternative structural purpose that is apparent to the rater or documented by the builder, architect or engineer. No more than 5% of studs may lack an apparent or documented structural purpose, which is equivalent to one vertical stud for every 30 linear feet of wall, assuming 16” stud spacing.”
121	<ul style="list-style-type: none"> • One respondent suggested allowing cripple studs to maintain on center stud spacing, which the respondent felt to be missing from footnote 5; this concern may be covered by the provision for accommodating apertures in footnote 7. 	<ul style="list-style-type: none"> • EPA agrees with the respondent that the appropriate use of cripple studs needs to be clarified. 	<ul style="list-style-type: none"> • EPA has clarified this requirement in the proposed guidelines as follows: “Framing at windows shall be limited to a maximum of one pair of king studs and one pair jack studs per window opening to support the header and window sill. Additional jack studs shall be used only as needed for

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			structural support and cripple studs only as needed to maintain on-center spacing of studs.”
122	<ul style="list-style-type: none"> One respondent noted that the use of a structural engineered framing layout to document the structural purpose of framing will be problematic as it is not common to have this as part of construction documents. 	<ul style="list-style-type: none"> When studs do not have a structural purpose that is apparent to the rater, then the rater must either count them towards the maximum allowed limit of 5% or obtain documentation from the builder, architect, or engineer. Documentation may take the form of a structural engineering framing layout but can also take other forms. EPA agrees with the respondent that this documentation may not be included in the plan and may require coordination with the builder, architect, or engineer to obtain. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines as follows: “Vertical framing members shall either be on-center or have an alternative structural purpose that is apparent to the rater or documented by the builder, architect or engineer. No more than 5% of studs may lack an apparent or documented structural purpose, which is equivalent to one vertical stud for every 30 linear feet of wall, assuming 16” stud spacing.”
123	<ul style="list-style-type: none"> Two respondents noted that raters can’t know whether headers are insulated without being there when it is built, and that this should be builder verifiable. 	<ul style="list-style-type: none"> EPA agrees that it may be difficult for the rater to field-verify the presence of insulated headers and that the rater should have the option of allowing this item to be builder-verified. 	<ul style="list-style-type: none"> EPA has eliminated the proposed Quality Framing checklist and transferred these requirements along with those in the current Thermal Bypass checklist into a new Thermal Enclosure System Rater checklist. As part of this process, EPA has also increased the number of allowances for builder-verified items to account for the possibility of builder-verified insulated headers.
124	<ul style="list-style-type: none"> Two respondents noted the insulated header requirement is not possible with a 2x4 header. 	<ul style="list-style-type: none"> EPA research indicates that structural insulated panel headers are available that can accommodate 2x4 framing. Additionally, ½ inch of polyiso rigid insulation between two 2x header members would provide the required insulation value of R-3.5. 	<ul style="list-style-type: none"> No policy change.
125	<ul style="list-style-type: none"> Two respondents expressed concern over the structural need for solid headers over large openings. 	<ul style="list-style-type: none"> EPA research indicates 2x framing members can accommodate many large openings, which would still allow for the use of ½ inch of polyiso rigid insulation to meet the requirement for insulated headers. Where structural engineered framing layout indicates that full-depth solid headers are required, than that header shall be exempt from the insulation requirement. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines to indicate that where structural engineered framing layout indicates that full-depth solid headers are required, than that header shall be exempt from the insulation requirement.

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126	<ul style="list-style-type: none"> Two respondents asked for clarification as to whether the R-5 requirement of the insulated header included the framing material. 	<ul style="list-style-type: none"> EPA agrees with the respondent that the requirement needs to be clarified to state that the R-value applies to the nominal insulation level, not the assembly. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines to indicate that the R-value required applies to the nominal insulation level and not the assembly.
127	<ul style="list-style-type: none"> One respondent felt the OVE option was appropriate for ENERGY STAR, but should not be represented as OVE, which includes other considerations such as stud spacing, locating openings at on center studs, etc. 	<ul style="list-style-type: none"> EPA agrees that the requirements in the proposed guidelines do not encompass the full range of details typically cited for OVE and that a different name is appropriate. 	<ul style="list-style-type: none"> EPA has eliminated the proposed Quality Framing checklist and transferred these requirements along with those of the current Thermal Bypass checklist into a new Thermal Enclosure System Rater checklist. As part of this process, EPA has renamed the option as "Advanced Framing".
128	<ul style="list-style-type: none"> One respondent asked how the OVE option would be implemented when a structural engineer draws the framing plan, and if 'framed to plan' is acceptable. 	<ul style="list-style-type: none"> EPA includes an exemption in the proposed guidelines that allows for additional framing if it has a documented purpose by the builder, architect, or engineer. Therefore, to meet the Advanced Framing option (formerly called OVE option) a structural framing plan must include the required details, such as insulated corners, insulated headers, insulated intersections of interior/exterior walls, and the inclusion of only structurally appropriate framing, and compliance with the plan must be verified in the field by the rater. However, where the plan indicates that additional framing is necessary that would exceed the amount required by EPA's checklist, then the home can still be qualified. 	<ul style="list-style-type: none"> No policy change.
129	<ul style="list-style-type: none"> One respondent asked for clarification whether the two king/jack studs required in footnote 5 were per side or total. 	<ul style="list-style-type: none"> EPA agrees with the respondent that the requirements should be clarified to allow one pair of king studs and one pair of jack studs per window. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines as follows: "Framing at windows shall be limited to a maximum of one pair of king studs and one pair jack studs per window opening to support the header and window sill. Additional jack studs shall be used only as needed for structural support and cripple studs only as needed to maintain on-center spacing of studs."

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130	<ul style="list-style-type: none"> One respondent suggested that in Footnote 4, eliminating structural headers in non-header walls should also qualify. 	<ul style="list-style-type: none"> EPA agrees with the respondent that if a header is not structurally necessary and is removed from the wall, then it doesn't have to be insulated. However, because this is somewhat self-evident no policy clarification is needed. 	<ul style="list-style-type: none"> No policy change.
131	<ul style="list-style-type: none"> One respondent was appreciative of the explicit inclusion of SIPs and ICFs in the Quality Framing checklist. 	<ul style="list-style-type: none"> EPA appreciates the support of the respondent. 	<ul style="list-style-type: none"> No policy change.
132	<ul style="list-style-type: none"> One respondent asked if double-framed walls were required to be offset when insulating the cavity, while another suggested that an option for separating studs with at least 1" insulation instead of offsetting. 	<ul style="list-style-type: none"> For the double-framed wall option, the scope of work clearly calls for offset framing. Regarding alternative compliance options, EPA states on the first page of the checklists that alternative methods of meeting the checklist requirements, such as a continuous 1" layer of insulation, may be used if the Provider deems them to be equivalent to or more stringent than the checklist guidelines. 	<ul style="list-style-type: none"> No policy change.
133	<ul style="list-style-type: none"> One respondent asked if the whole house would not be eligible for qualification if the double-framed wall was not offset. 	<ul style="list-style-type: none"> Where the double-framed wall is the chosen option for Advanced Framing requirements, the scope of work clearly calls for offset framing. Therefore, if the framing was not offset and no equivalent means of compliance was pursued, then the home would not be eligible for qualification. However, EPA states on the first page of the checklists that alternative methods of meeting the checklist requirements, such as a continuous 1" layer of insulation, may be used if the Provider deems them to be equivalent to or more stringent than the checklist guidelines. 	<ul style="list-style-type: none"> No policy change.
134	<ul style="list-style-type: none"> One respondent requested that the minimum R-value of the continuous insulated sheathing be specified. 	<ul style="list-style-type: none"> EPA agrees that more clarification is needed. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines as follows: "Continuous insulated sheathing shall be at least R-3 in Climate Zones 1 to 3; R-6 in Zones 4 to 6; and R-10 in Zones 7 and 8."

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Water Management System Checklist

ID	Comment Summary	EPA's Response	EPA's Policy Decision
Foundation			
135	<ul style="list-style-type: none"> One respondent noted that the 2006 IRC technical bulletin #7 allows for the use of polyethylene without mastic, in contrast to the checklist's mastic requirement, while another suggested a polyethylene thickness of 10 mil rather than 6. 	<ul style="list-style-type: none"> EPA was unable to locate the technical bulletin noted by the respondent. If the respondent can provide additional detail about this allowance, EPA will consider integrating it into the proposed guidelines. 	<ul style="list-style-type: none"> No policy change.
136	<ul style="list-style-type: none"> There are concerns that guideline 1.6 would disallow the use high-density spray-foam insulation and that guideline 1.8 should allow the use of products that do not require wrapping or gravel. 	<ul style="list-style-type: none"> EPA does not currently allow high-density foam on the interior of a foundation wall because it would not allow the concrete wall to dry to the inside and it can't dry to the outside because the ground is saturated. If a high-density spray foam insulation manufacturer would provide a warranty against Water Management System problems with this application, then EPA would consider the allowance of the product for this application. EPA agrees with the respondent that alternate means of compliance besides the use of gravel and wrapping may meet the intent of the requirement and that these alternates are allowed. EPA states on the first page of the checklists that alternative methods of meeting the checklist requirements may be used if the Provider deems them to be equivalent to or more stringent than the checklist guidelines. 	<ul style="list-style-type: none"> No policy change.
137	<ul style="list-style-type: none"> Clarification was requested regarding how far the 0.25 inch per foot slope in guideline 1.1 must extend from the house. 	<ul style="list-style-type: none"> EPA agrees with respondent that clarification is needed. A 10' distance shall be used to coincide with the requirement for finished grade. In most cases, this will enable the entire length of the patio slab to be sloped and for the first 10' of driveways and sidewalks to be sloped. In addition, swales or drains may be used where it's impractical to achieve the 10' distance that's required. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines as follows: "Patio slabs, walks, and driveways sloped > 0.25 in. per ft. away from home to edge of surface or 10 ft., whichever is less."
138	<ul style="list-style-type: none"> In relation to the pouring of the foundation, respondents suggested that sand not be allowed as a slab base and expressed concern that sheeting in contact with the concrete pour could adversely affect curing and finishing. Some also worried that backfill tamping can 	<ul style="list-style-type: none"> EPA has no documentation that clearly suggests a new requirement is needed to not allow sand as a concrete slab base. EPA research indicates that recommended scope of work for plastic sheeting below slabs is standard practice across the country. EPA does not have clear documentation that backfill 	<ul style="list-style-type: none"> No policy change.

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	cause micro cracks in a newly poured foundation.	tamping causes significant problems.	
Walls			
139	<ul style="list-style-type: none"> Some respondents wondered whether rigid flashing would be allowed in addition to flexible flashing, and noted many rigid products are not sloped. 	<ul style="list-style-type: none"> Rigid products for pan flashing are not required to be sloped, but this is highly recommended. EPA states on the first page of the checklists that alternative methods of meeting the checklist requirements may be used if the Provider deems them to be equivalent to or more stringent than the checklist guidelines. 	<ul style="list-style-type: none"> No policy change.
140	<ul style="list-style-type: none"> Others stated that certain ENERGY STAR windows are not thick enough to accommodate furring strips, a drainage plane and insulated exterior sheathing. 	<ul style="list-style-type: none"> EPA research and field experience indicates that high-performance windows can accommodate flashing requirements and, if necessary, insulated sheathing. 	<ul style="list-style-type: none"> No policy change.
141	<ul style="list-style-type: none"> Clarification was requested as to whether all types of siding require flashing at the bottom of the wall. 	<ul style="list-style-type: none"> Building science experts agree that water gets behind all siding materials with no exceptions. Thus, all siding materials must be installed so water can drain away at the bottom of the wall. 	<ul style="list-style-type: none"> No policy change.
142	<ul style="list-style-type: none"> There was a request that guideline 2.2 allow any water-resistive barrier recognized by ICC-ES or other accredited agency, rather than specifying specific types of products. 	<ul style="list-style-type: none"> For convenience, EPA has listed the most common materials for meeting the drainage plane requirement. However, EPA states on the first page of the checklists that alternative methods of meeting the checklist requirements may be used if the Provider deems them to be equivalent to or more stringent than the checklist guidelines. 	<ul style="list-style-type: none"> No policy change.
Roof			
143	<ul style="list-style-type: none"> A respondent stated that because other requirements address the root causes of ice damming, it was unnecessary to require bituminous membranes at eaves. One respondent requested that EPA refer to membranes complying with ASTM D7349 rather than "bituminous membranes". 	<ul style="list-style-type: none"> EPA research confirms that building science experts agree that roof eaves in cold climates are exposed to severe weather conditions and should include self sealing bituminous membranes, or equivalent. EPA agrees that clarifying that other products meeting ASTM D7349 can also be used to meet this requirement. 	<ul style="list-style-type: none"> EPA has revised the Water Management System Builder checklist to clarify that "Equivalent products to self-sealing bituminous membranes include those compliant with ASTM D7349".
144	<ul style="list-style-type: none"> In regards to gutters, there was concern that the requirement to drain 5 ft. from the foundation would be difficult with houses built close together. On a related note, it was suggested that gutter leaf guards be required when near trees. 	<ul style="list-style-type: none"> EPA's proposed guidelines include a provision for underground catchment systems in place of the 5' drain requirement to accommodate houses that are spaced closely together. However, in many cases, EPA believes that homes will be able to meet the 5' drainage requirement simply using above or below-grade pipes. EPA does not believe that gutter leaf guards need to be added to the guidelines at this time. 	<ul style="list-style-type: none"> No policy change.

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Materials			
145	<ul style="list-style-type: none"> Respondents requested that guideline 4.2's moisture-resistant material requirements be waived when using full fiberglass or equivalent tub or shower, and also noted that these types of materials may not be fire rated for assemblies, which poses a problem in multi-family construction. 	<ul style="list-style-type: none"> Even with water-proof liners, there is substantial Water Management System vapor driving force at shower/tub walls. Thus, Water Management System resistant materials should be used. However, as with all ENERGY STAR requirements, local code always takes precedence and if moisture-resistant materials are not acceptable by code then they are not required. 	<ul style="list-style-type: none"> No policy change.
146	<ul style="list-style-type: none"> One respondent requested that guideline 4.4's permeability requirements include an exception for shower or tub walls made of impermeable materials like ceramic tile. 	<ul style="list-style-type: none"> EPA agrees with the respondent that the intent of 4.4 on the Water Managed Construction checklist was not to limit tile and shower/tub walls made of impermeable materials. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines as follows: "Impermeable materials like ceramic tile may be used at shower and tub walls."
147	<ul style="list-style-type: none"> Respondents suggested further bath and shower requirements regarding solid blocking, flashing, and mold-resistant materials. 	<ul style="list-style-type: none"> EPA has developed the current list of requirements for materials based on extensive review with experts. Additional requirements will be considered for the future where documentation clearly demonstrates risk reduction with advanced Water Management System control details. 	<ul style="list-style-type: none"> No policy change.
148	<ul style="list-style-type: none"> Clarification was requested on the minimum allowable distance between a toilet, bath or shower and carpeting. 	<ul style="list-style-type: none"> EPA recommends at least 2.5 feet clearance from toilets, tubs, and showers to carpeting, which provides adequate distance for towel drying. 	<ul style="list-style-type: none"> EPA has clarified this requirement in the proposed guidelines as follows: "Wall-to-wall carpet not installed within 2.5 feet of toilets and bathing fixtures (e.g., tubs and showers)."
149	<ul style="list-style-type: none"> Several comments addressed the ambiguity in guideline 4.6 (interior walls not enclosed with high Water Management System content) regarding: <ul style="list-style-type: none"> Who was to make the assessment? What exactly constituted "high Water Management System content"? 	<ul style="list-style-type: none"> It is EPA's intention that builders will determine compliance with this requirement. In addition, EPA agrees that the term "high Water Management System content" needs to be further clarified. 	<ul style="list-style-type: none"> EPA has relocated this requirement to the new Water Management System checklist for builders. Therefore, it will be the responsibility of the builder to assess compliance with this requirement. EPA has also clarified that for wet-applied insulation products, builders should follow manufacturer's drying recommendations and that lumber should not exceed 18% Water Management System content.
150	<ul style="list-style-type: none"> There was some confusion about the requirements of guideline 4.3 (piping in 	<ul style="list-style-type: none"> EPA agrees with respondents that this scope of work is confusing and will eliminate this requirement. 	<ul style="list-style-type: none"> EPA has revise the proposed guidelines by removing the

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	<p>exterior walls installed with insulation) and respondents requested clearer guidelines. For instance:</p> <ul style="list-style-type: none"> ○ One respondent wondered whether uninsulated pipes could be installed in fiberglass or spray-foam insulated walls; ○ Another suggested this should be allowed as long as 50% of the wall insulation is on the outside of the pipe. 		<p>requirement that piping in exterior walls be installed with insulation.</p>
151	<ul style="list-style-type: none"> ● A respondent proposed: <ul style="list-style-type: none"> ○ Adding guidelines to require vapor barriers in zones 1-3; ○ Prohibit vinyl wallpaper on exterior walls; ○ Requiring vapor barriers, when present, be outside of insulation; ○ Requiring crawlspaces be enclosed with 6-mil visqueen and include Water Management System sensors or a dehumidifier or AC supply vent; ○ Requiring radiant barriers to be perforated if installed on bottom of roof deck. 	<ul style="list-style-type: none"> ● EPA does not believe that vapor barriers must be installed on all exterior walls in climate zones 1 through 3 to achieve an effective water management system or that EPA needs to dictate the location of vapor barriers for all house types. ● EPA does effectively prohibit vinyl wallpaper on the interior side of exterior walls through its requirement for materials with a permeability rating >1 in these locations. ● EPA does require most crawlspaces to be enclosed with 6-mil polyethylene sheeting unless a concrete slab is installed over polyethylene. EPA does not believe that Water Management System sensors, dehumidifiers, or AC supply vents are required in crawlspaces to achieve an effective water management system. ● EPA believes that current research does not indicate the need for radiant barriers to be perforated. 	<ul style="list-style-type: none"> ● No policy change.
Verification			
152	<ul style="list-style-type: none"> ● With regards to verification: <ul style="list-style-type: none"> ○ One respondent suggested that items 4.5 and 4.6 (prohibiting water damaged and high Water Management System materials) are ongoing QA issues that can only be verified by the builder. ○ Another worried about the danger inherent in inspecting the roof measures and noted that the NAHB Green Building program specifically forbids verifiers from going on roofs to verify these details. 	<ul style="list-style-type: none"> ● EPA agrees that some items proposed on the Water Management System checklist should be verified by the builder, and not the rater, and that even for items that can be verified by the rater, some allowances for builder-verified items needs to be provided. 	<ul style="list-style-type: none"> ● EPA has renamed the Water-Managed Construction checklist to the Water Management System checklist and has divided it into one section for builders and one section for raters. Approximately half of the number of the items originally proposed has been relocated to the builder checklist, including the items related to roof inspections, moisture content, and water damage. The remainder has

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			been relocated to the rater checklist.
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Indoor Air Quality Checklist

ID	Comment Summary	EPA's Response	EPA's Policy Decision
General			
153	<ul style="list-style-type: none"> Multiple respondents stated that the inspection and testing requirements would be too onerous. 	<ul style="list-style-type: none"> EPA believes that the testing and visual verification required under this checklist will not be overly burdensome and, furthermore, is essential to ensuring that a quality-installed HVAC system is included with every qualified home. The only tests that must be completed by the rater are for pressure-balancing; ventilation rate; exhaust fan flow; exhaust fan sound level; and, for a limited number of homes, net exhaust flow or net supply flow. 	<ul style="list-style-type: none"> No policy change, though note that the Indoor Air Quality checklist has been eliminated and the proposed requirements have been relocated to the HVAC System Quality Installation checklists for the rater and HVAC contractor.
154	<ul style="list-style-type: none"> Some requested additional guidance as to which guidelines required field measurements and what those measurement methods should be. 	<ul style="list-style-type: none"> EPA agrees more guidance and clarification is needed for this checklist. 	<ul style="list-style-type: none"> Note that the Indoor Air Quality checklist has been eliminated and the proposed requirements have been relocated to the HVAC System Quality Installation checklists for the rater and HVAC contractor. In addition, EPA has indicated which items in the checklist require measured values.
155	<ul style="list-style-type: none"> One respondent proposed delaying the checklist until 2012, or phasing it in over time to allow builders to adjust to the requirements. 	<ul style="list-style-type: none"> EPA agrees with respondent that implementation of the new checklist items will require additional time beyond January 1, 2011. 	<ul style="list-style-type: none"> EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System

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			<p>Checklist shall be enforced. These checklist sections are similar to the requirements in the current Thermal Bypass Checklist. Effectively, this plan allows partners a full two years to educate and train partners and allow them to integrate the new mandatory checklists into their workflows prior to full implementation.</p>
156	<ul style="list-style-type: none"> • Several felt the checklist duplicated EPA's existing Indoor airPLUS program and suggested a co-labeling option instead. 	<ul style="list-style-type: none"> • EPA has selected a narrow subset of the Indoor airPLUS package (i.e., primarily compliance with ASHRAE 62.2 and water management system measures) for implementation in the new homes program. EPA believes that mechanical ventilation is essential given the aggressive infiltration requirements promoted by the new homes program and that a water management system must be included with every energy efficient home due to reduced tolerance for drying. 	<ul style="list-style-type: none"> • No policy change.
<p><i>Whole-Building Delivered Ventilation</i></p>			
157	<ul style="list-style-type: none"> • Regarding the ASHRAE 62.2 ventilation rate: <ul style="list-style-type: none"> ○ Multiple respondents suggested that the checklist focus on helping builders comply with 62.2, and remove the additional requirements. ○ One of the respondents includes a number of proposed changes to make the checklist fully compatible with 62.2 ○ Suggestion of adding ASHRAE 62.2 section references to each item in conjunction with a statement that the checklist is a tool for assisting in compliance with Standard 62.2, not a certification of acceptable indoor air quality. 	<ul style="list-style-type: none"> • EPA agrees that the purpose of the checklists is to ensure compliance with ASHRAE 62.2 and not as a certification of acceptable indoor air quality. 	<ul style="list-style-type: none"> • No policy change, though note that the Indoor Air Quality checklist has been eliminated and the proposed requirements have been relocated to the HVAC System Quality Installation checklists for the rater and HVAC contractor. In addition, a footnote has been added to clarify that the intent of the requirements is to align with ASHRAE 62.2, rather than serve as a guarantee of acceptable indoor air quality.
158	<ul style="list-style-type: none"> • Regarding whole-building mechanical delivered ventilation rate: <ul style="list-style-type: none"> ○ Several respondents claimed it would be a particular burden to 	<ul style="list-style-type: none"> • EPA believes that all energy efficient homes need to be properly ventilated, with no exception for multi-family units. Moreover, research has revealed new technologies such as through-the-wall whole-house 	<ul style="list-style-type: none"> • No policy change.

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	<p>multi-family dwellings.</p> <ul style="list-style-type: none"> ○ One respondent expressed concern that this would be particularly difficult to properly achieve in hot and humid climates. ○ There was also concern that this requirement could result in bringing in an unnecessary amount of humid air in hot-humid climates, leading to mold and Water Management System problems. 	<p>ventilation systems that may be ideally suited to multi-family homes.</p> <ul style="list-style-type: none"> ● EPA agrees with respondent that latent loads need to be properly managed and has included a design requirement to ensure that the HVAC system has the necessary capacity or that a dehumidifier has been installed. 	
159	<ul style="list-style-type: none"> ● It was suggested the reference to 62.2 2007 be changed to 62.2 2010 because the update will be released before 2011. 	<ul style="list-style-type: none"> ● EPA agrees with respondent. 	<ul style="list-style-type: none"> ● No policy change, though note that the Indoor Air Quality checklist has been eliminated and the proposed requirements have been relocated to the HVAC System Quality Installation checklists for the rater and HVAC contractor. In addition, a footnote has been added to clarify that the intent of the requirements is to align with ASHRAE 62.2-2010, rather than serve as a guarantee of acceptable indoor air quality.
Exhaust Fans			
160	<ul style="list-style-type: none"> ● Regarding the required airflow of the whole-building ventilation: <ul style="list-style-type: none"> ○ Respondents requested clarification whether this is the rated airflow, or whether a verification test is necessary. A respondent noted that LEED allows for the use of the rated flow, while another proposed a 10% tolerance if a test is to be performed. In either case, respondents suggest language clarifying the verification requirements on these two items (1.2 and 1.3). ○ It was also suggested that footnote 2 make clear it is the rater, not the HVAC contractor, who is to perform the airflow test. One respondent requested more explicit definitions of 	<ul style="list-style-type: none"> ● Substantial field data from experts around the country indicate that the actual performance of mechanical ventilation systems is very spotty due to poor installation practices and poor maintenance. For this reason, EPA will require that rater test the actual flow of the ventilation system, but will provide a tolerance level for determining compliance. ● The term “net exhaust flow” is referenced from ASHRAE 62.2-2010 and is defined as the flow through an exhaust system minus the compensating outdoor airflow through any supply system that is interlocked to the exhaust system. The term “net supply flow” is intended to represent the inverse. ● Warm-humid climates are defined by section 301.2 of the 2009 IECC, while very cold climates are defined by climate zone 7 & 8 of the 2009 IECC. 	<ul style="list-style-type: none"> ● Note that the Indoor Air Quality checklist has been eliminated and the proposed requirements have been relocated to the HVAC System Quality Installation checklists for the rater and HVAC contractor. In addition, EPA has indicated in the rater checklist that the rater must field-verify the actual flow of the ventilation system and that it must be within 100-120% of the contractor-specified value. The terms “next exhaust flow” and “net supply flow” have been defined, as well as the definitions of “hot-humid” and “very cold” climates.

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	<p>the terms “net exhaust flow” and “net supply flow”.</p> <ul style="list-style-type: none"> ○ Several respondents requested definitions of “hot-humid” and “very cold” climates, while one suggested using three categories instead: Hot, Mixed, and Cold, with Mixed including climate zones 3 and 4. 		
161	<ul style="list-style-type: none"> ● Regarding local kitchen exhaust fans: <ul style="list-style-type: none"> ○ Multiple respondents requested that the requirements clearly state that kitchen exhaust should be directly ducted to outdoors. ○ Respondents wanted clarification on whether kitchens with electric appliances are exempt. ○ There was concern that kitchen exhaust systems can be problematic in attached or multi-family housing buildings, where kitchens can be located further from exterior walls. 	<ul style="list-style-type: none"> ● EPA agrees with respondents that a definition of exhaust system is needed. ● Kitchens with electric appliances are not exempt from the requirement for exhaust fans, because cooking byproducts, such as water vapor, must still be removed from the building. ● While EPA recognizes that exhaust systems in multi-family buildings may not be standard practice, the need for such systems is no different than for single-family homes and, therefore, must remain a requirement. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by adding a definition for exhaust systems, which is aligned with ASHRAE 62.2-2010.
162	<ul style="list-style-type: none"> ● On the subject of bathroom exhaust fans: <ul style="list-style-type: none"> ○ Respondents requested clarification on whether all rooms in a bathroom (such as a half bath with toilet in one room, sink in other room) required exhaust fans. ○ Because savings are particularly diminished in bathrooms with little use, one respondent suggested that EPA only require one qualified bathroom exhaust fan per home, possibly requiring that it be installed in the master bathroom. ○ Another asked for an exemption for ½ baths since Water Management System is not as much of an issue. ○ Other respondents recommended that in-line and multi-port bathroom exhaust systems be allowed ○ To enhance clarity, one respondent requested that the exhaust fan requirements be grouped with the 	<ul style="list-style-type: none"> ● To clarify intent, EPA intends to align the definition with that of ASHRAE 62.2-2010, for which a bathroom is any room containing a bathtub, shower, spa, or similar source of moisture. Therefore, half-baths would be excluded from the requirement for ENERGY STAR qualified exhaust fans. ● In-line and multi-port bathroom exhaust fans are not prohibited from being used to comply with program guidelines. ● EPA agrees with respondents that exhaust fan requirements should be grouped with other ventilation requirements and clarified as to when the ENERGY STAR qualification is required. 	<ul style="list-style-type: none"> ● EPA has revised the proposed HVAC System Quality Installation Rater checklist by only requiring exhaust fans in bathrooms, where the definition of a “bathroom” is aligned with ASHRAE 62.2-2010. ● EPA has included the requirement for ENERGY STAR qualified exhaust fans with the other ventilation requirements in the HVAC System Quality Installation Rater checklist, and has clarified the ventilation and exhaust fan rating requirements as follows: <ul style="list-style-type: none"> ○ Intermittent exhaust fans shall be ENERGY STAR qualified; unless rated flow rate > 400 CFM; ○ Continuous exhaust fans shall be ENERGY STAR

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	<p>other ventilation-related requirements.</p> <ul style="list-style-type: none"> ○ One respondent requested that EPA clarify whether an exhaust fan must be ENERGY STAR qualified if it is also used as part of a whole-house ventilation system 		<p>qualified & rated at < 1 sone;</p> <ul style="list-style-type: none"> ○ Intermittent supply fans rated at < 3 sone, unless rated flow rate > 400 CFM; ○ Continuous supply fans rated at < 1 sone
163	<ul style="list-style-type: none"> ● Multiple respondents asked why the fan sound requirement is needed or felt that this would be achieved by default due to the requirement for ENERGY STAR qualified fans. ● Respondents proposed clarifying that these are to be rated, not measured, fan flows. 	<ul style="list-style-type: none"> ● EPA's research suggest that low sounds ratings are required because high sound ratings can deter occupants from using exhaust systems effectively. In addition, ASHRAE 62.2-2010 requires low sound ratings for many fan installations; however, these requirements are not perfectly aligned with the ENERGY STAR fan program. Therefore, EPA will clarify the scenarios under which ENERGY STAR qualified fans are required and those where more restrictive sound ratings apply. ● EPA research indicates that measured fan flow is important to verify as part of an effective exhaust system. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by clarifying which fans must be ENERGY STAR qualified and which fans will require separate or more stringent sound ratings. It has also clarified that measured, not rated, fan flows are required to be verified.
164	<ul style="list-style-type: none"> ● Regarding guideline 2.5: <ul style="list-style-type: none"> ○ One respondent felt the limit of 15 CFM per 100 sq. ft. of conditioned space is contradictory to mechanical exhaust requirements, and may be infeasible in small homes. ○ Another suggested moving that requirement closer to the other fan rate limits (2.1 and 2.2). ○ One respondent proposed making it clear in the guideline itself (rather than the footnote) that this only applies to homes with atmospherically vented appliances or solid fuel burning appliances, since those homes are the exception rather than the rule. ○ A respondent asked whether the exhaust flow requirement exemption includes gas ranges. 	<ul style="list-style-type: none"> ● EPA has added a requirement that combustion appliances not be atmospherically vented. With this change, the net exhaust flow limit only applies to homes with solid-fuel burning appliances. For this small minority of homes, the limit on net exhaust can be avoided by utilizing continuous exhaust fans or balanced systems. ● EPA agrees with the respondent that the sequence of requirements could be better organized within the checklist. ● EPA believes that gas ranges should not be considered when determining the applicability of the net exhaust flow requirement. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines to prohibit atmospherically vented appliances from being installed within the house. ● Note that the Indoor Air Quality checklist has been eliminated and the proposed requirements have been relocated to the HVAC System Quality Installation checklists for the rater and HVAC contractor. EPA has rearranged the sequence of requirements within these checklists to improve clarity.
165	<ul style="list-style-type: none"> ● Regarding local exhaust, a respondent suggested: 	<ul style="list-style-type: none"> ● EPA intends to align with the requirements of ASHRAE 62.2-2010 and generally not to include supplemental 	<ul style="list-style-type: none"> ● No policy change.

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	<ul style="list-style-type: none"> ○ Adding a requirement to 2.6 that clothes dryers not be allowed to vent upwards at all in order to avoid lint buildup. ○ Requiring crank-timer controlled exhaust fans for bathrooms and kitchens. ○ Prohibiting hoodless down-drafting exhaust systems in the kitchen. 	requirements such as those suggested by respondents.	
Air Inlets			
166	<ul style="list-style-type: none"> ● With regards to air inlets and ventilation sources: <ul style="list-style-type: none"> ○ Multiple respondents were concerned that an inlet that was unobstructed at the time of sign-off could later be blocked by plantings or landscaping. Because of this they suggested a builder sign-off option for this requirement (5.2). ○ Another respondent proposed the additional requirement that air inlets should have at least one foot clearance above grade. ○ One respondent requested clarification on whether inlets required dampers. ○ Respondents in Wisconsin noted the placement of vents and intakes is governed by code. 	<ul style="list-style-type: none"> ● EPA agrees with respondents that raters can only be responsible for verifying unobstructed inlets at the time of inspection and than requiring a minimum distance above-grade was an appropriate addition to help ensure proper functioning of the ventilation system after inspection. ● EPA intends to align with ASHRAE 62.2-2010, which does not require dampers on inlets, though it does require mesh rodent/insect screens, which are required. ● EPA's current guidelines already state that in cases where a local code requirement conflicts with the guidelines, the local code requirement shall be met instead of the requirement in the guidelines. This allowance will be maintained in the new guidelines. 	<ul style="list-style-type: none"> ● EPA has revised proposed guidelines to require that air inlets be at least 2 ft. above grade in Climate Zones 1-3 or at least 4 ft. above grade in Climate Zones 4-8 and not obstructed by snow, plantings, or other material at time of inspection. ● No policy change regarding conflicts with code, though EPA has clarified its guidance in the proposed guidelines regarding situations where local codes overlap with EPA's requirements. In brief, local code requirements shall continue to take precedence over the requirements of EPA's guidelines.
Garage Isolation			
167	<ul style="list-style-type: none"> ● Concerning garage isolation: <ul style="list-style-type: none"> ○ Several respondents disagreed with the ban on the air handler and ducts in the garage, arguing that placing them in the attic (a likely alternative) would be worse from a thermal standpoint. ○ Respondents suggested allowing the air handler and ducts in the garage with the additional requirements for a more stringent standard of unit/duct tightness and 	<ul style="list-style-type: none"> ● EPA is concerned that air handlers and return ducts located in garages are susceptible to damage and disruption that will result in air intake from the garage, even when the initial installation is substantially air-tight. Therefore, it believes that it is important to maintain the prohibition that has been proposed. ● While requiring a pressure differential test and self-closing doors would further ensure air quality in the house, EPA feels that visual inspection for bypasses along with the requirements for a gasketed door is sufficient for this iteration of the guidelines. ● EPA is not sure how the respondents suggest further 	<ul style="list-style-type: none"> ● No policy change.

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	<p>garage venting, as ASHRAE 62.2 does.</p> <ul style="list-style-type: none"> ○ One respondent suggested including a requirement for self-closing doors between the house and garage, while another proposed a pressure differential testing requirement to ensure airtightness. ○ Respondents also requested that EPA clarify the wording “supply and return ducts” in 6.1 and “doors to the garage” in 6.2. 	<p>clarifying the phrases “return ducts” and “garage doors adjacent to occupiable spaces”.</p>	
Appliances and Detectors			
168	<ul style="list-style-type: none"> • Regarding appliances and detectors, several respondents disagreed with the ban on ventless combustion appliances: <ul style="list-style-type: none"> ○ One described the ban as “arbitrary”, stating the EPA does not provide supporting evidence, in violation of EPA’s Office of Management and Budget Information Quality Guidelines; ○ One argued that the ban could be problematic in areas that experience ice storms, where ventless fireplaces are common; ○ One respondent was in favor of the ban and proposed a further requirement that kitchen cooking appliances must be equipped with exhaust to outdoors; ○ Another proposed explicitly prohibiting “unvented gas logs”; ○ A respondent suggested the term “unvented” rather than “ventless”. • There were mixed feelings on CO detectors, with one respondent arguing they are already covered by code, while another expressed support and suggested requiring one on each floor with a bedroom. 	<ul style="list-style-type: none"> • In light of EPA’s new proposed requirement that combustion appliances be direct-vented or mechanically vented to outdoors, it has removed the requirement for CO detectors. • While EPA would prefer to also prohibit ventless combustion appliances in qualified homes, it will remove the proposed prohibition given that ASHRAE 62.2-2010 does not encompass such appliances, that most ventless combustion appliances are not installed at the time of construction, and that these system types likely operate for a limited number of hours per year (e.g., only as emergency backup during ice storms). 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines by requiring combustion appliances to be direct-vented or mechanically vented to outdoors and has removed the requirement for CO detectors. It has also noted that ventless combustion appliances are not prohibit from inclusion in qualified homes.
169	<ul style="list-style-type: none"> • A respondent proposed: <ul style="list-style-type: none"> ○ Prohibiting attached garages altogether, citing indoor air quality 	<ul style="list-style-type: none"> • While requiring detached garages or carports would further ensure air quality in the house, EPA feels that visual inspection for bypasses along with the 	<ul style="list-style-type: none"> • No policy change regarding garages. However, EPA has revised the proposed guidelines

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	<p>concerns. An attached carport is a sufficient alternative.</p> <ul style="list-style-type: none"> ○ Installing both CO detectors and alarms in any home with combustion appliances. This respondent felt that this was necessary. 	<p>requirements for a gasketed door is sufficient for this iteration of the guidelines.</p> <ul style="list-style-type: none"> ● In light of EPA's new proposed requirement that combustion appliances be direct-vented or mechanically vented to outdoors, it has removed the requirement for CO detectors. 	<p>by requiring combustion appliances to be direct-vented or mechanically vented to outdoors and has removed the requirement for CO detectors.</p>
HVAC Filter			
170	<ul style="list-style-type: none"> ● Concerning the HVAC filtration section (8): <ul style="list-style-type: none"> ○ One respondent was concerned that the small fan sizes in multi-family units may make this an onerous requirement. ○ Even in single-family homes one respondent was concerned the pressure drop over the MERV 8 filter could create the need for an additional HVAC system to have the necessary fan power. ○ One respondent suggested including this portion on the HVAC contractor checklist to make the requirements clearer to the contractor. ○ Another requested clarification as to whether "ducted mechanical systems" referred only to ducted heating and cooling systems, or whether it included ventilation systems as well. 	<ul style="list-style-type: none"> ● EPA intends to align with ASHRAE 62.2-2010, with its requirement for a MERV 6 or better filter, in place of the originally proposed requirement for a MERV 8 filter, which should be achievable even in multi-family units. ● EPA has maintained this requirement in the rater checklist because it is an item that can be verified by the rater. However, it will be important for the rater to convey this and other requirements on the rater checklist to the builder to help ensure compliance. ● EPA agrees with respondent that a definition for ducted mechanical systems needs to be provided. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by requiring a MERV 6 or better filter and by defining "ducted mechanical systems" per ASHRAE 62.2-2010 - ducted mechanical systems are those that supply air to an occupiable space through ductwork exceeding 10 ft in length and through a thermal conditioning component, except for evaporative coolers.
171	<ul style="list-style-type: none"> ● Several respondents suggested including radon mitigation measures. They stated that some of these measures are inexpensive compared to other requirements in the checklist, and feel that leaving radon to building codes is unreliable. 	<ul style="list-style-type: none"> ● While EPA agrees with respondents that radon mitigation measures would further ensure indoor air quality, it believes that requiring them for the 2011 guidelines would represent too significant a change for all partners. However, EPA encourages builders to consider adopting the Indoor airPLUS package for those seeking a comprehensive set of guidelines. 	<ul style="list-style-type: none"> ● No policy change.
172	<ul style="list-style-type: none"> ● A respondent proposed including an exemption from the MERV 8 filter requirements for AC systems with a sensible heat ratio less than 0.3. 	<ul style="list-style-type: none"> ● EPA believes that proper filtration and adequate latent capacity are necessary for all qualified homes. 	<ul style="list-style-type: none"> ● No policy change.

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Space Heating, Space Cooling, and Water Heating Equipment

ID	Comment Summary	EPA's Response	EPA's Policy Decision
Space Cooling & Heating			
173	<ul style="list-style-type: none"> Two respondents requested an increase in equipment efficiency – one to meet ENERGY STAR requirements in all climates and one to meet federal tax credit requirements in all climates. 	<ul style="list-style-type: none"> EPA has aligned its proposed guidelines with ENERGY STAR qualified products, where doing so complemented the goals of the new homes program. Requiring high efficiency cooling in cold climates and high efficiency heating in hot climates would significantly impact the cost-effectiveness of the guidelines without delivering significantly more savings. The efficiency levels promoted by ENERGY STAR guidelines are determined using cost-effectiveness as a factor, without regard to potentially temporary tax credits. Partners that wish to exceed the minimum requirements of the guidelines to leverage the tax credits may do so. 	<ul style="list-style-type: none"> No policy change
174	<ul style="list-style-type: none"> With specific regard to space cooling equipment, one respondent requested that an EER requirement be added for cooling equipment in mixed and cold climates, just as one exists in hot climates. 	<ul style="list-style-type: none"> EPA has elected to include EER requirements in its proposed new homes guidelines because ENERGY STAR qualified heatpumps and air conditioners include this metric in their performance requirements. Because there is no federal minimum standard for EER and the importance of EER decreases in cold climates, EPA believes that its addition to the proposed guidelines is not warranted at this time. 	<ul style="list-style-type: none"> No policy change.
175	<ul style="list-style-type: none"> With specific regard to space heating equipment: <ul style="list-style-type: none"> One respondent requested that EPA require the use of sealed combustion, direct-vent, or power-vented space heaters, water heaters, and fireplaces, with visual inspection to ensure proper installation. In addition to the safety benefits, the respondent noted that this would also help reduce fan-induced infiltration and prevent the need for expensive upgrades if closed combustion appliances are installed at a later time. 	<ul style="list-style-type: none"> EPA's review of building science expert recommendations confirms that mechanically drafted or direct-vented equipment is essential to improve both efficiency and combustion safety. Further, for homes that include the necessary venting for direct-vented equipment at the time of construction, the infrastructure to use this preferred equipment is provided at the lowest possible cost and eliminate costs and space requirements for a 'B' vent. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to require that all combustion appliances, including both space-heating and water-heating equipment, located within the home's pressure boundary shall be mechanically drafted or direct-vented.
176	<ul style="list-style-type: none"> A number of respondents commented on heatpump requirements, particularly in cold 	<ul style="list-style-type: none"> EPA was unable to find a specific performance designation or specification for cold-climate heatpumps. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to include the

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	<p>climates. Respondents alternately suggested that EPA:</p> <ul style="list-style-type: none"> ○ Specify the use of heatpumps specifically designed for use in cold climates in climate zones 4 through 8; ○ Require a higher HSPF value for these climate zones; ○ Require that homes with heatpumps in these climates use the performance path; maintain a prescriptive option for the use of heatpumps in climate zones 4 and 5, due their high prevalence in some markets; ○ Maintain a prescriptive path for small homes and attached homes with heatpumps, due their small loads and the lack of gas infrastructure in some markets; ○ One respondent also requested that EPA clarify that ductless mini-split heatpumps can be used to meet the requirements of the prescriptive path. 	<p>EPA agrees with respondents that a heatpump option should be maintained in cold climates, but that the performance of such systems should be improved. Lastly, EPA believes that the prescriptive requirements of the proposed guidelines have been written such that mini-split heatpumps and any other heatpump types that meet the stated requirements can be used as a means for compliance.</p>	<p>prescriptive options for electric-heated equipment in cold climates that are listed in the following three bullets.</p> <ul style="list-style-type: none"> ● Air-source heat pump, ENERGY STAR qualified with efficiency as follows: <ul style="list-style-type: none"> ● CZ 4: ≥ 8.5 HSPF / 14.5 SEER / 12 EER with electric backup; <u>OR</u> ● CZ 5: ≥ 9.25 HSPF / 14.5 SEER / 12 EER with electric backup; <u>OR</u> ● CZ 6: ≥ 9.5 HSPF / 14.5 SEER / 12 EER with electric backup; <u>OR</u> ● Air-source heat pump, ENERGY STAR qualified, ≥ 8.2 HSPF / 14.5 SEER / 12 EER with ENERGY STAR qualified dual-fuel backup; <u>OR</u> ● Ground-source heat pump, any product type, ENERGY STAR qualified
177	<ul style="list-style-type: none"> ● Also regarding heating equipment, one respondent requested that EPA add an option to the prescriptive path for the use of biomass heating systems. 	<ul style="list-style-type: none"> ● For simplicity and ease of enforceability, EPA has limited the prescriptive requirements of the guidelines to the most predominant technologies used in construction. Partners are encouraged to pursue innovative technologies such as biomass heating systems through the performance path. 	<ul style="list-style-type: none"> ● No policy change.
178	<ul style="list-style-type: none"> ● Regarding thermostats: <ul style="list-style-type: none"> ○ One respondent requested that EPA clarify that ENERGY STAR qualified thermostats will only be required as long as the product category continues to exist; ○ Another respondent noted that programmable thermostats can cause short-cycling if their throttling range is not properly set. 	<ul style="list-style-type: none"> ● EPA will be sun-setting the ENERGY STAR label for thermostats and agrees with respondent that clarification is needed. ● EPA is not aware of research showing that proper throttling settings are a source of significant savings or of standards that it can reference regarding commissioning of programmable thermostats. Therefore, EPA believes that this is beyond the scope of the guidelines at this time. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by removing the reference to ENERGY STAR for programmable thermostats. Therefore, a programmable thermostat is still required in the ENERGY STAR Reference Design, but not one that is ENERGY STAR qualified. Note also that if EPA resurrects the ENERGY STAR Qualified Thermostats program, then such

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			products may be incorporated into the ENERGY STAR Reference Design.
Water Heating			
179	<ul style="list-style-type: none"> • Regarding water heating equipment: <ul style="list-style-type: none"> ○ Multiple respondents suggested that efficiency requirements should increase with the size of the tank, rather than decrease, so as not to encourage the use of larger tanks. ○ Others noted that the requirements were too lenient overall and should be aligned with the requirements for ENERGY STAR labeled water heaters (which would exclude the use of electric resistance water heaters), noting that this would be consistent with EPA's proposed requirement to use other labeled products. ○ In contrast, one respondent felt that the proposed requirements for electric water heaters was too stringent given the savings that would be achieved and that this requirement would preclude the use of the prescriptive path by many builders. ○ Another expressed concern about small water heaters (i.e., "low-boys") used in multi-family units, which won't meet the proposed efficiency requirements and will therefore make use of the prescriptive path difficult. 	<ul style="list-style-type: none"> • EPA believes that it is appropriate to decrease the required efficiency of water heaters with increasing tank size, because this mirrors the trend in federal minimum standards. Requiring efficiency to increase with increasing tank size would effectively prohibit the use of large tanks and encourage the installation of multiple small tanks. • EPA did consider aligning the water heater efficiency requirements with the ENERGY STAR Water Heater program, but felt that the incremental costs were too great to justify aligning with the program at this time, given all of the changes already required. This was particularly true for electric systems, which would require solar water heating or heatpump water heaters. However, EPA encourages partners that wish to use these innovative technologies to pursue the performance path. • EPA has not increased the required efficiency for water heaters in the proposed guidelines relative to the current guidelines and therefore feels that they are not too stringent. 	<ul style="list-style-type: none"> • No policy change.
180	<ul style="list-style-type: none"> • A respondent requested a provision for installing water heaters in garages in warm climates, noting the higher outdoor temperature (resulting in higher efficiency operation) and reduced chance of mildew in case of a leak. The respondent may not be aware that there are no limitations being proposed for water heater location. 	<ul style="list-style-type: none"> • EPA has not included any requirements in the proposed guidelines dictating the location of water heaters. Therefore, no special provision is needed to allow water heaters to be installed in the garage. 	<ul style="list-style-type: none"> • No policy change.

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181	<ul style="list-style-type: none"> For clarity, one respondent requested that 40 and 50 gallon tanks be included in the examples included by EPA. 	<ul style="list-style-type: none"> EPA believes that it has included some of the more common equipment sizes and has included an equation in the footnote that allows partners to quickly calculate the required efficiency for additional sizes. 	<ul style="list-style-type: none"> No policy change.
Miscellaneous			
182	<ul style="list-style-type: none"> From a design perspective, one respondent requested that for all homes with gas service, EPA require the installation of a gas line that can accommodate the capacity required for the future installation of an instant gas water heater. 	<ul style="list-style-type: none"> EPA believes that requiring an investment in fuel systems to accommodate a single specific technology that might be installed in the future is beyond the scope of ENERGY STAR. 	<ul style="list-style-type: none"> No policy change.
183	<ul style="list-style-type: none"> A respondent requested that EPA require the installation of a line voltage outlet and condensate drains to support future installations of whole-house instant water heaters. 	<ul style="list-style-type: none"> EPA believes that requiring an investment in fuel systems to accommodate a single specific technology that might be installed in the future is beyond the scope of ENERGY STAR. 	<ul style="list-style-type: none"> No policy change.
184	<ul style="list-style-type: none"> Regarding the location of equipment, one respondent requested that EPA not allow equipment to be installed in the attic unless it is cathedralized, due to performance degradation and difficulty to upgrade to more efficient equipment after completion of construction. 	<ul style="list-style-type: none"> EPA appreciates that locating space conditioning equipment in a conditioned space or conditioned attic is preferable, but observations suggest that this would be too difficult to integrate into mainstream construction practices in large regions of the country at this time. 	<ul style="list-style-type: none"> No policy change.

HVAC System Quality Installation Checklist

ID	Comment Summary	EPA's Response	EPA's Policy Decision
Qualifications and Responsibilities			
185	<ul style="list-style-type: none"> There were a number of comments from respondents concerned that raters are not adequately trained and equipped to perform HVAC quality assurance, and worries that HVAC contractors would not react well to advice from a rater with limited HVAC knowledge. At the same time there were positive comments stating that HVAC QA should indeed be part of the rater's responsibility. To resolve the qualification concerns, respondents requested training support, possibly including training modules on the 	<ul style="list-style-type: none"> EPA research continues to confirm the value of proper HVAC installation. However, EPA agrees that additional time and training will be needed to prepare the raters to assess compliance with this checklist. In addition, EPA agrees with respondents that the requirements need to be clarified so that the roles and responsibilities of the HVAC contractor and rater are clearly delineated. 	<ul style="list-style-type: none"> EPA has added an additional one year transition period from January 1, 2011 to January 1, 2012 during which lack of compliance with the new checklist requirements will not result in disqualification of the home. That is to say, for each home qualified during the 2011 calendar year, all requirements of the new performance path and prescriptive path shall be met and all mandatory checklists

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	<p>proper installation of equipment.</p>		<p>shall be completed, but only Sections 3 and 5 of the new Thermal Enclosure System Checklist shall be enforced.</p> <ul style="list-style-type: none"> • EPA also intends to provide extensive training resources to partners, including regional training classes, field guides, and webinars. • Lastly, EPA has revised the program requirements to state that “the Rater is only responsible for ensuring that the Contractor has completed the Contractor checklist in its entirety, not for assessing the accuracy of the load calculations or field verifications included. It is the contractor’s exclusive responsibility to ensure the system design and installation comply with the Contractor checklist specifications.”
<p>186</p>	<ul style="list-style-type: none"> • An issue in some comments was confusion about how far the Rater’s responsibility extended in section 1 of the rater checklist: <ul style="list-style-type: none"> ○ It was not clear to several respondents whether raters were to check the details of the Manual J calculation or perform the verification tests themselves, rather than simply signing off that the contractor had checked off these items. ○ There was also concern that this ambiguity could open raters up to liability by giving the impression that the rater had checked the work of the contractor, rather than simply signing off on the completion of the contractor checklist. • For these two reasons respondents requested language clarifying the rater was 	<ul style="list-style-type: none"> • EPA agrees with respondents that the requirements need to be clarified so that the roles and responsibilities of the HVAC contractor and rater are clearly delineated. 	<ul style="list-style-type: none"> • EPA has revised the program requirements to state that “the Rater is only responsible for ensuring that the Contractor has completed the Contractor checklist in its entirety, not for assessing the accuracy of the load calculations or field verifications included. It is the contractor’s exclusive responsibility to ensure the system design and installation comply with the Contractor checklist specifications.”

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	only responsible for verifying proper completion of the contractor checklist.		
Equipment Specification, Design, and Documentation			
187	<ul style="list-style-type: none"> • Regarding the equipment design portion of the HVAC QI Contractor checklist: <ul style="list-style-type: none"> ○ Respondents suggested addressing additional types of HVAC equipment such as furnaces, boilers, evaporative coolers, GSHPs, solar-thermal and in-floor heat. ○ It was also suggested that heat loss and heat gain calculations be performed to ensure a right-sized furnace. 	<ul style="list-style-type: none"> • EPA's intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol, which encompasses furnaces, heatpumps, and vapor-compression cooling equipment. Therefore, EPA agrees with respondents that proper sizing and installation of heating equipment covered within the current protocol is appropriate to include in the proposed guidelines. • At this time, EPA does not intend to invest in the development of additional protocols for system types that are not covered by the ANSI / ACCA protocol. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with ANSI / ACCA 5 QI-2007 protocol, including the addition of requirements for proper sizing and installation of furnaces and heatpumps.
188	<ul style="list-style-type: none"> • Several respondents expressed concern that the checklists' focus on air conditioning equipment makes it inappropriate in heating-driven climates: <ul style="list-style-type: none"> ○ One respondent pointed to a study of the Wisconsin market that showed air conditioner commissioning results in 3-5% savings. ○ Respondents felt the lower savings in colder climates did not justify the added cost. 	<ul style="list-style-type: none"> • Even though EPA agrees with respondents that energy savings are smaller in colder climates, many northern states still experience summer peak load conditions that make right-sized air conditioning important. In addition, right-sized AC equipment will reduce the first cost for many home buyers. • Furthermore, the checklist has been expanded to include heatpumps and furnaces, which will provide additional value for homes in cold climates. 	<ul style="list-style-type: none"> • No policy change regarding the requirement for quality-installed AC systems in all climates. However, EPA has revised the proposed guidelines to align with ANSI / ACCA 5 QI-2007 protocol, including the addition of requirements for proper sizing and installation of furnaces and heatpumps.
189	<ul style="list-style-type: none"> • With regards to the ARI reference number: <ul style="list-style-type: none"> ○ Respondents requested an option to use equipment that is not ARI-rated, such as some models from Hallowell and First Co. ○ Another respondent noted that some models popular in multi-family construction do not carry ARI ratings. ○ On a minor language note, a respondent suggested that "ARI" be changed to "AHRI" throughout. 	<ul style="list-style-type: none"> • EPA's intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol, which does allow for systems that are not AHRI rated, as long as a copy of OEM-provided catalog data indicating acceptable combination selection and performance data is provided. • EPA agrees with respondent that references to ARI should be updated to AHRI. 	<ul style="list-style-type: none"> • EPA has updated the proposed guidelines to allow for systems that are not AHRI rated, as long as a copy of OEM-provided catalog data indicating acceptable combination selection and performance data is provided. • EPA has also updated references in the proposed guidelines from ARI to AHRI.
190	<ul style="list-style-type: none"> • Respondents noted that the design section of the checklist would logically be the responsibility of the HVAC designer, who may be different from the HVAC technician. This would require an additional signature 	<ul style="list-style-type: none"> • EPA agrees with the respondent. 	<ul style="list-style-type: none"> • EPA has updated the proposed guidelines to require that the person responsible for the heating, cooling, and ventilation design, whether it be the HVAC

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	line for the designer to sign.		technician or someone else, shall be responsible for completing the design sections of the contractor checklist and signing the checklist.
191	<ul style="list-style-type: none"> • With respect to outdoor design temperatures: <ul style="list-style-type: none"> ○ Respondents worried that allowing “prevailing local practices” could result in the use of extreme temperatures that may negate the intent of performing a design calculation. ○ Respondents suggested setting a limit of 5-10% within ASHRAE 99.0% if weather data can be documented to support the adjustment or only allowing the exception based on code or regulation. ○ Alternatively, a respondent suggested requiring the design temperature to “comply with the procedure being used”, Manual J or otherwise, as different methods reference various design temperature sources. 	<ul style="list-style-type: none"> • EPA believes that outdoor temperatures should generally be selected in compliance with the load-calculation standard being used by the HVAC designer. However, EPA also believes that if prevailing local practice uses alternative design temperatures due to the presence of a microclimate, then those temperatures should be permitted to be used if the corresponding weather data documentation is available. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to require the HVAC designer to document the design temperatures used for each home’s load calculations. • In addition, it has indicated that outdoor temperatures should be selected in compliance with the load-calculation standard being used by the HVAC designer, except when prevailing local practice uses alternative design temperatures due to the presence of a microclimate. In such situations, those temperatures may be used if the corresponding weather data documentation is submitted with the checklist.
192	<ul style="list-style-type: none"> • Several respondents commented that the “99% design temperature” in guideline 2.1.1 and footnote 3 refer to winter temperatures and suggest changing the language to “1% design temperature”. 	<ul style="list-style-type: none"> • EPA agrees with respondents. 	<ul style="list-style-type: none"> • As part of aligning the proposed guidelines with the ANSI / ACCA 5 QI-2007 protocol, EPA has resolved this discrepancy.
193	<ul style="list-style-type: none"> • There were several requests to add additional guidance on the equipment design calculations: <ul style="list-style-type: none"> ○ According to one respondent, contractors often overestimate heating and cooling loads by assuming lower insulation R-values and higher window U-factors than are actually installed. The respondent suggested adding a requirement that the installed R- 	<ul style="list-style-type: none"> • While ACCA Manual J and equivalent sizing procedures dictate that the inputs used in the load calculation be reflective of the home, EPA agrees with respondents that it will be helpful to highlight certain critical inputs. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to clarify the values that should be used for outdoor design temperatures, indoor design temperatures, infiltration rate, insulation levels, and window performance, and to note that the calculations should account for a MERV 6 filter and a ventilation system compliant with ASHRAE 62.2.

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	<ul style="list-style-type: none"> values and U-factors must be used in the Manual J calculation. ○ Another respondent suggested that the presence of a MERV 8 filter be explicitly called for in the design stage, since it is required by the Indoor Air Quality checklist. ○ A respondent suggested a requirement for the infiltration rate to be set to the “infiltration target specified by ES Guidelines”, in addition to allowing the option to set it to “tight”. 		<ul style="list-style-type: none"> • EPA has also clarified that the infiltration rate should be set to “Tight” or equivalent rate, where an equivalent rate would include the actual tested infiltration rate of the rated home or the infiltration level specified in the ENERGY STAR Reference Design.
194	<ul style="list-style-type: none"> • Regarding the sensible heat ratio requirement in guideline 2.5: <ul style="list-style-type: none"> ○ A respondent suggested equipment with SHR higher than 0.7 are uncommon at higher SEER values, making a separate dehumidifier likely. The respondent would like this requirement to be made more clear, and asked for a minimum standard definition on dehumidifiers. Specifically, the respondent is concerned that thermostats with extra run time past the set point in the case of high humidity may be considered by some to satisfy this requirement. ○ On a related note, a different respondent suggested requiring the sensible and latent capacity to satisfy the respective design loads, rather than requiring a fixed sensible heat ratio. 	<ul style="list-style-type: none"> • EPA agrees with respondents that as long as the latent capacity of the HVAC equipment meets or exceeds the latent load of the home, then the intent of this requirement will be met. EPA also agrees that if the latent load is not met, further guidance should be provided about the required dehumidifier. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to require that the HVAC designer compare the latent capacity of the selected equipment to the latent load of the rated home and, where the load is not met, install an ENERGY STAR qualified dehumidifier.
195	<ul style="list-style-type: none"> • Manual D duct sizing calculations were the target of several comments: <ul style="list-style-type: none"> ○ There is concern that Manual D duct sizing does not allow for flexible duct work and this respondent requests an alternative design method that does. ○ There were also requests to specify 	<ul style="list-style-type: none"> • EPA’s review of ACCA Manual D suggests that the use of flexible ducts is allowed by this standard, as well as the use of a ductulator program to help achieve the standard’s requirements. • EPA will require low duct leakage and adequate airflow through alignment with the ANSI / ACCA 5 QI-2007 protocol, but believes that ACCA Manual D provides additional requirements that will help ensure the 	<ul style="list-style-type: none"> • No policy change.

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	<p>which are considered equivalent procedures to Manual D. For instance one respondent would prefer to use a ductulator program instead of Manual D.</p> <ul style="list-style-type: none"> ○ Other respondents suggested that Manual D duct sizing can be subjective and recommended a verification approach that ensures low duct loss and adequate air flow delivery in place of design requirements. 	<p>performance of the HVAC system.</p>	
196	<ul style="list-style-type: none"> ● Regarding the drain pan requirement: <ul style="list-style-type: none"> ○ A respondent requested a definition of “properly sloped”. ○ Another respondent suggested the drain pan requirement is not a design issue and may be more appropriate in the field verification section. 	<ul style="list-style-type: none"> ● EPA agrees with respondents that “properly sloped” can be more clearly defined and that the drain pan inspection requirement should be part of the field inspection portion of the checklist. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines to clarify that the drain pan shall be sloped enough so it does not retain standing condensate and has moved this item to the field-verification section of the contractor checklist.
197	<ul style="list-style-type: none"> ● A respondent suggested that footnote 4 should refer to the 2009 IRC or IECC instead of the 2004 supplement to the IRC. 	<ul style="list-style-type: none"> ● EPA agrees with the respondent. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by updating all IECC references to the 2009 IECC.
198	<ul style="list-style-type: none"> ● A respondent proposed requiring that the AC system be able to reach 50% RH at all temperatures between 70 and 80 degrees in all partial-load and even no-load conditions. 	<ul style="list-style-type: none"> ● While more precise humidity control would be beneficial to a home, EPA believes that this requirement would be difficult to implement because performance ratings are not tailored to determine compliance with such a requirement. 	<ul style="list-style-type: none"> ● No policy change.
199	<ul style="list-style-type: none"> ● A respondent requested more detailed requirements on what sources should be used to gather information used in the Manual J calculation. Simply requiring a Manual J calculation without specifying input sources could lead to unreliable results. 	<ul style="list-style-type: none"> ● While ACCA Manual J and equivalent sizing procedures dictate that the inputs used in the load calculation be reflective of the home, EPA agrees with respondent that it will be helpful to highlight certain critical inputs. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines to clarify the values that should be used for outdoor design temperatures, indoor design temperatures, infiltration rate, insulation levels, and window performance, and to note that the calculations should account for a MERV 6 filter and a ventilation system compliant with ASHRAE 62.2.
200	<ul style="list-style-type: none"> ● Regarding the limits on equipment oversizing in the contractor checklist, one respondent suggested that prohibiting oversizing beyond 10% can sometimes 	<ul style="list-style-type: none"> ● While EPA appreciates the respondent’s comments, EPA’s intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol and associated ACCA design manuals, which dictate the 	<ul style="list-style-type: none"> ● No policy change.

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	<p>impair more efficient operation and improved occupant comfort. Instead they suggested requiring that the mandatory efficiency be met at the Manual S load, rather than full load, or that the manufacturer's part load correction term must be applied for units oversized more than 10%.</p>	<p>limit on oversizing.</p>	
201	<ul style="list-style-type: none"> Regarding footnote 4 of the rater checklist, a respondent requested that EPA specify what duct leakage to outdoors should be used in the HERS software if that test is waived per this footnote. 	<ul style="list-style-type: none"> EPA's exemption on duct testing applies to the ENERGY STAR guidelines alone and are not intended to dictate RESNET policy. Therefore, EPA believes that partners using the performance path and EPA's exemption on duct leakage testing should defer to the RESNET standards for permissible assumptions about untested duct systems. 	<ul style="list-style-type: none"> No policy change.
202	<ul style="list-style-type: none"> Regarding the sensible heat ratio requirements: <ul style="list-style-type: none"> A respondent proposes that this requirement be expanded to encompass homes in climate zones 1-4A. On a related note, the respondent felt that a SHR of 0.7 or lower would not be sufficient to control humidity and suggested allowing a multispeed A/C unit with an ERV or dehumidifying supply air ventilation as an alternative to a standalone dehumidifier. 	<ul style="list-style-type: none"> EPA believes that as long as the latent capacity of the HVAC equipment meets or exceeds the latent load of the home, then the intent of this requirement will be met. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to require that the HVAC designer compare the latent capacity of the selected equipment to the latent load of the rated home and, where the load is not met, install an ENERGY STAR qualified dehumidifier.
203	<ul style="list-style-type: none"> A respondent suggested expanding the checklist to encompass economizers and evaporative air conditioners in climate zones 1-4B, and possibly C, accompanied by requirements for proper installation. 	<ul style="list-style-type: none"> EPA's intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol, which encompasses furnaces, heatpumps, and vapor-compression cooling equipment. At this time EPA does not intend to invest in the development of additional protocols for system types that are not covered by the ANSI / ACCA protocol. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines to align with ANSI / ACCA 5 QI-2007 protocol, including the addition of requirements for proper sizing and installation of furnaces and heatpumps. While other system types may be included in ENERGY STAR qualified homes, these system types will be exempted from many sections of the HVAC System Quality Installation Contractor checklist.

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Field Verification			
204	<ul style="list-style-type: none"> • Comments in this area related to the field verification portion of the HVAC QI contractor checklist and the first section of the rater checklist. Some respondents questioned whether it was necessary to have the rater fill out a separate checklist and suggested the contractor review portion of the rater checklist could be integrated into the contractor checklist by adding an additional column and signature line. 	<ul style="list-style-type: none"> • EPA believes that the requirements for the HVAC contractor and rater are distinct enough that two checklists are warranted. However, EPA agrees with the respondent that the originally proposed rater checklist can be streamlined to minimize duplicate effort when the rater is verifying the contractor checklist. 	<ul style="list-style-type: none"> • EPA has maintained both an HVAC System Quality Installation checklist for the Rater and for the HVAC contractor. However, with regards to the rater's review of the HVAC contractor's checklist, EPA has revised the proposed guidelines by reducing this requirement to a single line-item in the rater checklist, which simply states, "HVAC System Contractor checklist completed in its entirety".
205	<ul style="list-style-type: none"> • Many comments focused on the 5% tolerance for the field verified values. Respondents generally felt that 5% was unreasonable or infeasible based on the resolution of testing methods and the precision of equipment ratings. For instance, respondents noted that equipment airflow is often reported in ranges like 350-450 cfm, making a 5% tolerance unachievable. Another example given was the tolerance stack of the measurements necessary to determine capacity: airflow, temperatures and Water Management System content each have a measurement tolerance which, when combined, exceed 5%. Respondents suggested that deviations of 10-15% be allowed instead, noting that ANSI/ACCA 5 QI allows 15% for some measurements. 	<ul style="list-style-type: none"> • EPA agrees with the respondents that the originally proposed tolerance levels can be improved. EPA's intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol, and its associated tolerances. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with the ANSI / ACCA 5 QI-2007 protocol, and its associated tolerances.
206	<ul style="list-style-type: none"> • There were concerns that some testing procedures are not well defined, which may lead to a lack of consistency: <ul style="list-style-type: none"> ○ One respondent requested clearer standards for the resolution and calibration of equipment required for various measurements. ○ Another questioned how to measure capacity, and noted a lack of protocols for whole house air flow. ○ In general, respondents requested 	<ul style="list-style-type: none"> • EPA's intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol, which should clarify many of the respondents' requests for improved clarity. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with the ANSI / ACCA 5 QI-2007 protocol, and its associated terminology and acceptable methods of testing.

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	clarification on acceptable methods of testing.		
207	<ul style="list-style-type: none"> • Another issue presented in many comments was the checklists' divergence from ANSI/ACCA 5 QI – 2007 standards, upon which, it is pointed out, the ENERGY STAR Home Performance QI standards are based. Respondents stated that in some cases the checklists were more stringent, and in other cases less. Some specific changes to align the checklists with the ACCA standards included; <ul style="list-style-type: none"> ○ Allow airflow measurements based on any of the four methods listed in ACCA QI section 4.1 as options instead of measuring supply and return duct pressures. ○ Do not require measurements of the equipment capacity since no industry standard method of test exists. The respondent suggests that when the equipment is properly selected based on the load calculations, the capacity will be acceptable when the airflow and refrigerant charge are within acceptable ranges. ○ Add additional verification items including those related to electrical, combustion, venting, airflow balance and documentation. 	<ul style="list-style-type: none"> • EPA agrees with respondent's concerns. EPA's intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with the ANSI / ACCA 5 QI-2007 protocol.
208	<ul style="list-style-type: none"> • In regards to the fan, respondents expressed confusion about why the fan speed setting was required. • One respondent asked if the CFM was meant to be the labeled or measured CFM. If the former, they questioned why there would be a difference between the design and field values, and if the latter they wondered how it would differ from the airflow at the evaporator. 	<ul style="list-style-type: none"> • EPA agrees with respondent's concerns. EPA's intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol and its associated requirements for airflow. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with the ANSI / ACCA 5 QI-2007 protocol. With this revision, the requirement to document the fan speed setting has been eliminated.
209	<ul style="list-style-type: none"> • One respondent was concerned that requiring true flow or duct blaster air flow 	<ul style="list-style-type: none"> • EPA's intention was not to endorse a particular product or company and agrees with respondents that such 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to clarify the

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	measurement methods limited permissible test equipment to products that are exclusive to the Energy Conservancy.	references should be avoided.	acceptable test methodologies for determining air flow (i.e., flow grid, pressure matching, anemometer, fan curve, temperature rise, or other) and to eliminate any references to particular products or companies.
210	<ul style="list-style-type: none"> • Regarding equipment capacity verification: <ul style="list-style-type: none"> ○ One respondent questioned how to measure latent and sensible capacity without being in ARI design conditions. ○ Another suggested changing the term “gain” to “capacity” to avoid confusion. 	<ul style="list-style-type: none"> • EPA agrees with respondent’s concerns. EPA’s intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol and its associated requirements and terminology. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with the ANSI / ACCA 5 QI-2007 protocol. With this revision, the measurement of latent and sensible capacity are no longer required and the terms “heat gain” and “heat loss” are used in the design section, while “capacity” is used in the equipment selection section.
211	<ul style="list-style-type: none"> • Regarding refrigerant charge verification: <ul style="list-style-type: none"> ○ A respondent stated that newer Lennox TXV models do not use the approach temperature method and suggests changing the language in the rater checklist guideline 6.11. ○ On a related note, one respondent suggested that if a TXV is considered equivalent to commissioning, the program should simply require TXVs in all installations. ○ It was also suggested that, due to issues that can arise in field installations of TXVs, all TXVs should be factory installed in order to qualify under note 8 on the contractor checklist. 	<ul style="list-style-type: none"> • EPA agrees with respondent’s concerns about Lennox TXV models. EPA’s intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol and its associated requirements and terminology. • Testing is EPA’s preferred approach for ensuring proper HVAC performance, but allows the alternate for TXV’s so that homes built during cold seasons can continue to be ENERGY STAR qualified. • EPA appreciates the respondent’s concerns about field-installed TXV’s. However, EPA’s review of research suggests that TXV’s that are properly field-installed can perform as intended. Therefore, EPA believes additional guidance is required to ensure proper field installation. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with the ANSI / ACCA 5 QI-2007 protocol. With this revision, specific references to Lennox models have been removed. In addition, EPA has added the follow guidance on the field installation of TXV’s, “TXV sensing bulbs shall be insulated and tightly clamped to the vapor line with good linear thermal contact at the recommended orientation, usually 4 and 8 o’clock.”
212	<ul style="list-style-type: none"> • Some respondents expressed confusion on the precise meaning of “design value” and “field value”. • It was suggested that a footnote be added clarifying that “design value” refers to those values found in the Manual S and J calculations, rather than the ARI values. 	<ul style="list-style-type: none"> • EPA agrees with respondent’s concerns. EPA’s intent with this iteration of the guidelines is to align with the ANSI / ACCA 5 QI-2007 protocol and its associated terminology, which should resolve these concerns. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to align with the ANSI / ACCA 5 QI-2007 protocol. With this revision, the terminology has been clarified as design values (associated with the load calculation) and selected values (associated with the selected

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			equipment parameters).
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Ducts

ID	Comment Summary	EPA's Response	EPA's Policy Decision
213	<ul style="list-style-type: none"> • One respondent questioned the need to insulate the return ducts at the same level as supply ducts and suggested that all supply ducts be insulated to R-8, with all return ducts insulated to R-6. • As an alternative, respondents suggested making the R-8 level of insulation an optional, rather than mandatory, requirement. 	<ul style="list-style-type: none"> • Based on respondent's concerns, EPA believes that additional flexibility can be provided in the performance path for duct insulation levels, without compromising the overall intent of the proposed guidelines. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines in the following manner: <ul style="list-style-type: none"> ○ For the ENERGY STAR Reference Design, EPA has aligned with the requirements of the 2009 IECC, which requires R-8 for supply ducts in unconditioned attics, and R-6 for all other supply ducts and all return ducts, ○ For the performance path, EPA has set a minimum insulation level of R-6 for all ducts, allowing partners to use higher levels of insulation as they see fit.
214	<ul style="list-style-type: none"> • Regarding duct leakage: <ul style="list-style-type: none"> ○ Several respondents questioned whether the total duct leakage test was necessary in addition to the duct leakage to outside. Meeting the total leakage target, respondents worried, would require abnormal steps like caulking boots to drywall in conditioned space, which they felt added little value. ○ Others worried that if a failure is found it would be too late to correct any problems since interior ducts would already be covered. An Energy Center of Wisconsin study was cited, which indicated that duct 	<ul style="list-style-type: none"> • Feedback from building science experts to EPA consistently cites the importance of total duct leakage measurements to ensure that conditioned air is delivered to intended spaces. Based on feedback received, EPA believes that the limit of 6 CFM per 100 sq. ft. of conditioned space is reasonable and achievable. • Furthermore, EPA believes that measures such as sealing duct boots to the drywall are inexpensive and valuable to achieving the overall duct leakage requirement. 	<ul style="list-style-type: none"> • No policy change regarding the overall duct leakage requirement. However, EPA has added a specific requirement in the HVAC System Quality Installation checklist for raters to verify sealing of duct boots to the floor, wall, or ceiling using caulk, foam or mastic

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	<p>losses in practice are low.</p> <ul style="list-style-type: none"> ○ Respondents requested eliminating the total duct leakage requirement altogether, or raising it to 8-10 CFM per 100 sq. ft. On the other hand, some respondents were supportive of total duct leakage testing. 		
215	<ul style="list-style-type: none"> ● Separately, a respondent suggested changing the total and outside duct leakage benchmarks to a percentage of nominal fan flow, rather than a set CFM per 100 sq. ft. They claimed that the current method creates a low bar for well insulated homes with low cooling and heating loads. 	<ul style="list-style-type: none"> ● EPA has defined duct leakage in terms of nominal fan flow in past iterations of the guidelines, but found that this promoted increases in fan size and associated airflow, which minimized savings. 	<ul style="list-style-type: none"> ● No policy change.
216	<ul style="list-style-type: none"> ● One respondent noted the difficulty of small homes and attached units to meet the proposed leakage requirements. For example, for a 1200 square foot unit, the maximum allowed leakage to outdoors is 48 CFM. The respondent requested that EPA allow 6 CFM leakage to outdoors per 100 square feet of conditioned floor area for homes under 1200 square feet, which would allow an extra 24 CFM of leakage. They believe this will be more achievable and have a minimum impact on performance. 	<ul style="list-style-type: none"> ● EPA recognizes that small homes may have more difficulty meeting the leakage requirement when the air handler is located outside of conditioned space, but also notes that many small homes are multi-family units, where air handlers are typically located within conditioned space. Ultimately, EPA believes that there is not a clear rationale to allow homes below a specific size to be granted an exemption on the duct leakage requirement. 	<ul style="list-style-type: none"> ● No policy change.
217	<ul style="list-style-type: none"> ● With regards to the HVAC QI Rater checklist requirements forbidding bends over 90°, looped coiling and duct compression (2.1-2.3): <ul style="list-style-type: none"> ○ Respondents raised concerns over the lack of clear standards and worried this subjectivity would lead to inconsistent application. ○ Respondents also stated bends over 90 degrees and looped ductwork were sometimes necessary in homes with engineered joists. ○ One respondent claimed that looped duct work is a common method of limiting flows to diffusers close to the air handler and pushing air to longer runs. It was argued that as long as 	<ul style="list-style-type: none"> ● The duct installation requirements are based on extensive feedback from building science experts across the country. They are intentionally left with some room for interpretation by the individual rater to assess whether the overall intent of the checklist has been met, in contrast to minor oversights. Overall, the intent is to start rejecting the most egregious installation practices. ● With that said, EPA appreciates the respondent's concerns for increased clarity and that achieving this will help partners meet EPA's intentions. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by rewording the requirement for no bends over 90° as follows: "Connections and routing of ductwork completed without kinks or sharp bends, where kinks are caused when ducts are bent across sharp corners such as framing members and sharp bends occur when the radius of the duct centerline is less than one duct diameter." This should allow partners to install ductwork with greater than 90° bends as long as they're done gradually. ● EPA has also clarified its

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	<p>proper static pressure and airflow was achieved, indicating a well functioning duct system as a whole, a home should not be disqualified for these types of details.</p> <ul style="list-style-type: none"> ○ One respondent was concerned about requiring straight ducts runs because intentional bends are sometimes used to mitigate acoustical problems. 		<p>requirements regarding looped ductwork as follows: “Ducts shall not include coiled or looped ductwork except where needed for acoustical control. Balancing dampers shall be used instead of loops to limit flow to diffusers.”</p>
218	<ul style="list-style-type: none"> ● Regarding bedroom pressure balancing (HVAC QI Rater 2.10): <ul style="list-style-type: none"> ○ Many respondents requested that a testing option for compliance be included in addition to the current grill area method. ○ Respondents suggested a limit of 3 Pascals pressure differential with the doors closed. It was felt that this would be simpler to test in some cases and be a more reliable indicator of performance. It was pointed out that Indoor airPLUS allows this option. 	<ul style="list-style-type: none"> ● EPA agrees with respondents that a performance testing alternative is reasonable. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines to include a performance testing alternative for verification of pressure-balancing, which is aligned with the Indoor airPLUS package and states, “As alternative to prescriptive requirement, a measured pressure differential no greater than 3 Pa (0.012 in. w.c.) between closed rooms and adjacent spaces that have a return is permitted to demonstrate compliance.”
219	<ul style="list-style-type: none"> ● In contrast to these requests for more lenient requirements, multiple respondents requested an increase in stringency. These suggestions included: <ul style="list-style-type: none"> ○ Requiring R-4 insulation for ducts in conditioned space to prevent condensation and to ensure expected delivery temperature of air; ○ Increasing the level of insulation for ducts in crawlspaces to R-8 (to align with the attic requirement); ○ Requiring the use of hard ducts in contrast to flex ducts; ○ Requiring water-based mastic and prohibiting tape; ○ Requiring centralized duct layout with shorts runs; ○ Requiring duct testing for all homes, even when ducts are located in 	<ul style="list-style-type: none"> ● EPA recognizes there are many desirable practices for proper HVAC installation, but has chosen to focus on those with most consistent expert consensus and those most ready for mainstream construction. With that said, EPA agrees with respondents that building cavities should be prohibited from being used for supply ducts in addition to return ducts and that ducts should not be installed in insulated walls. 	<ul style="list-style-type: none"> ● EPA has revised the proposed guidelines by adding the following two requirements to the HVAC System Quality Installation checklist for raters: <ul style="list-style-type: none"> ○ Building cavities shall not be used as supply or return ducts. ○ Ducts shall not be installed in insulated walls

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	<ul style="list-style-type: none"> o conditioned space; o Prohibiting building cavities from being used for supply ducts in addition to return ducts; o Prohibiting ducts in exterior walls, and; o Prohibiting the installation of ducts and air handlers outside the thermal enclosure system, due to the significant energy savings and difficulty of improving duct efficiency after completion of construction. 		
220	<ul style="list-style-type: none"> • With regards to testing, one respondent requested that EPA remove the allowance in the National Program footnote 21 to use testing protocols not approved by RESNET, noting that RESNET will add protocols such as Delta-Q as they become ready for standard use. 	<ul style="list-style-type: none"> • EPA agrees with respondent. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to state that “duct leakage shall be determined and documented by a Rater using a RESNET-approved testing protocol”.
221	<ul style="list-style-type: none"> • Several respondents were confused by footnote 4 of the HVAC QI Rater checklist as written and one suggested separating it into two separate footnotes as follows, with the first being referenced by guideline 2.8 and the second by 2.9: <ul style="list-style-type: none"> a. Duct leakage testing can be waived if all ducts are within conditioned space AND the envelope leakage is tested to below a certain level. b. Leakage to outdoors not needed if total duct leakage is found to be less than 4 CFM. 	<ul style="list-style-type: none"> • EPA agrees with respondent. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines to state in two separate footnotes that: <ul style="list-style-type: none"> a. Duct leakage testing can be waived if all ducts and air handling equipment are located in conditioned space (i.e., within the home’s air and thermal barriers) AND the envelope leakage has been tested to be ≤ 3 ACH50 OR ≤ 0.25 CFM50 per sq. ft. of the building envelope. b. If total duct leakage is ≤ 4 CFM25 then leakage to outdoors need not be tested
222	<ul style="list-style-type: none"> • Respondents asked EPA to clarify the following: <ul style="list-style-type: none"> o Whether the duct insulation requirements apply to the pressure-balancing and exhaust ducts; o Whether third-party duct testing is still a requirement of the program; o Whether the “required value” in 	<ul style="list-style-type: none"> • Duct insulation requirements apply to pressure-balancing ducts that transit unconditioned spaces, but do not apply to exhaust ducts. Based on respondents’ comments, EPA believes that the applicability of duct insulation, installation, and leakage requirements needs to be clarified. • As with current guidelines, duct leakage shall be determined and documented by a Rater using a 	<ul style="list-style-type: none"> • EPA has revised the HVAC System Quality Installation checklist for raters to clarify which duct system types the insulation, installation, and leakage requirements apply to. Duct quality installation requirements apply to all HVAC,

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	<p>footnote 22 refers to the maximum allowed leakage to the outside;</p> <ul style="list-style-type: none"> ○ To explicitly note the maximum allowed leakage value in the prescriptive path; ○ To explicitly specify CFM 25 or CFM 50 as the duct leakage test method. 	<p>RESNET-approved testing protocol.</p> <ul style="list-style-type: none"> • The “required value” mentioned by the respondent was intended to refer to maximum allowed leakage to the outside. EPA agrees with respondent that this should be clarified in the footnote. • EPA has included an explicit requirement in the ENERGY STAR Reference Design for the maximum allowed duct leakage of 4 CFM per 100 sq. ft. of conditioned floor area. • EPA intends for duct leakage to be tested at 25 Pa and agrees with respondent that this should be made explicit within the program guidelines. 	<p>ventilation, exhaust, and pressure-balancing ducts; duct insulation requirements apply to all HVAC, balanced-ventilation, and pressure-balancing ducts; duct leakage requirements apply to all HVAC and balanced-ventilation ducts.</p> <ul style="list-style-type: none"> • EPA has clarified the footnotes regarding duct testing exemptions and has specified that all duct leakage limits are intended to be measured at 25 Pa.
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Lighting

ID	Comment Summary	EPA’s Response	EPA’s Policy Decision
223	<ul style="list-style-type: none"> • Multiple respondents noted their support for the increased lighting requirements being proposed, citing the federal standards for increased efficiency that will be phased-in in the near future and the large amount of energy that lighting consumes. • The ability to meet the requirements using either pin-based or screw-in lamps was also commended. 	<ul style="list-style-type: none"> • EPA agrees that advanced lighting is very important to achieving overall energy savings. However, based on respondents’ concerns, EPA believes it can limit the requirements for efficient lighting to the ENERGY STAR reference design, allowing partners that use the performance path to pursue alternate measures that provide equivalent savings, if they so desire. 	<ul style="list-style-type: none"> • EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.
224	<ul style="list-style-type: none"> • Multiple respondents requested that the term “socket” be defined more precisely or redefined as “qualifying light fixtures” as defined by RESNET. It was noted that by relying on sockets, one non-compliant chandelier with many sockets could disqualify the entire home. 	<ul style="list-style-type: none"> • EPA agrees that the term “socket” is confusing and can be clarified. 	<ul style="list-style-type: none"> • EPA has revised the proposed guidelines by defining the lighting requirement in the prescriptive path and ENERGY STAR Reference Design as follows: “ENERGY STAR Advanced Lighting Package (ALP) shall be installed, or 80% of fixtures in RESNET-defined Qualifying Light Fixture Locations shall be

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			ENERGY STAR qualified or contain ENERGY STAR qualified CFLs.”
225	<ul style="list-style-type: none"> Some respondents requested that low-use areas (e.g., closets, halls, storage areas, attics) be excluded from the requirement due to the relatively low savings that would accrue. RESNET currently defines “qualifying light fixture locations”, which excludes some areas of low use. 	<ul style="list-style-type: none"> EPA agrees with respondent that efficient lighting can be limited to RESNET-defined Qualifying Light Fixture Locations. 	<ul style="list-style-type: none"> EPA has revised the proposed guidelines by defining the lighting requirement in the prescriptive path and ENERGY STAR Reference Design as follows: “ENERGY STAR Advanced Lighting Package (ALP) shall be installed, or 80% of fixtures in RESNET-defined Qualifying Light Fixture Locations shall be ENERGY STAR qualified or contain ENERGY STAR qualified CFLs.”
226	<ul style="list-style-type: none"> Multiple respondents noted the expense and difficulty specifically with recessed fixtures and standard dimmers, which may result in fewer builder-provided fixtures and increased inefficient portable lighting provided by the homeowner. 	<ul style="list-style-type: none"> EPA agrees that more flexibility is needed regarding lighting requirements. 	<ul style="list-style-type: none"> EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.
227	<ul style="list-style-type: none"> Multiple respondents noted that some builders allow homeowners to select their lighting and that limiting their options to ENERGY STAR qualified lighting will be difficult. 	<ul style="list-style-type: none"> EPA agrees that more flexibility is needed regarding lighting requirements. 	<ul style="list-style-type: none"> EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for

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			achieving equivalent savings.
228	<ul style="list-style-type: none"> One respondent requested that sensors, switches, and dimmers should be allowed to meet the requirements for efficient lighting, rather than just the efficiency of the lamp and ballast combination, similar to the allowances of California's energy code - Title 24. They state that when dimmers are paired with halogen lamps, the savings over non-dimmed incandescent lamps are significant. 	<ul style="list-style-type: none"> For the prescriptive path and ENERGY STAR Reference Design of the 2011 new homes guidelines, EPA will defer to the ENERGY STAR qualified light fixture and CFL programs and their respective criteria for defining efficient lighting. However, EPA notes that under the performance path, any lighting systems and controls that are recognized within the RESNET standards can be utilized to achieve the required ENERGY STAR HERS Index Target. 	<ul style="list-style-type: none"> EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.
229	<ul style="list-style-type: none"> One respondent requested that fixtures be required that have been approved by the International Dark-Sky Association (IDA). 	<ul style="list-style-type: none"> For the prescriptive path and ENERGY STAR Reference Design of the 2011 new homes guidelines, EPA will defer to the ENERGY STAR qualified light fixture and CFL programs and their respective criteria for defining efficient lighting. However, EPA notes that under the performance path, any lighting systems and controls that are recognized within the RESNET standards can be utilized to achieve the required ENERGY STAR HERS Index Target. 	<ul style="list-style-type: none"> EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.
230	<ul style="list-style-type: none"> One respondent requested that lighting recycling programs be more prevalent or mandatory prior to increasing the amount of efficient lighting that is required. 	<ul style="list-style-type: none"> EPA information indicates that recycling centers for expired fluorescent bulbs are widely available and that other alternative options that don't require special recycling are becoming increasingly available. 	<ul style="list-style-type: none"> EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for

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			achieving equivalent savings.
231	<ul style="list-style-type: none"> One respondent requested that EPA clarify whether LED lighting can be used to meet the proposed requirements. 	<ul style="list-style-type: none"> For the prescriptive path and ENERGY STAR Reference Design of the 2011 new homes guidelines, EPA will defer to the ENERGY STAR qualified light fixture and CFL programs and their respective criteria for defining efficient lighting. However, EPA notes that under the performance path, any lighting systems and controls that are recognized within the RESNET standards can be utilized to achieve the required ENERGY STAR HERS Index Target. 	<ul style="list-style-type: none"> EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.
232	<ul style="list-style-type: none"> Regarding verification, one respondent requested that builders be allowed to self-certify this requirement, due to the time and difficulty for a rater to determine compliance with each fixture in the house. 	<ul style="list-style-type: none"> For the performance path, EPA defers to the RESNET standards, which require verification of qualifying light fixtures while rating the home. For the prescriptive path, which contains ENERGY STAR lighting requirements in the ENERGY STAR Reference Design, EPA agrees that the use of builder-accountability tools can ease the verification process. 	<ul style="list-style-type: none"> EPA will continue to promote efficient lighting in the proposed guidelines. However, it has revised the proposed guidelines by removing it as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require it in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings. EPA will allow the rater to accept builder verification for installing the Advanced Lighting Package where the builder provides the rater a copy of the Advanced Lighting Package Declaration for each specific address. For the prescriptive path, EPA will develop a similar builder accountability form for energy efficient light bulbs that ensures the bulbs provided match the assumptions used for each rated

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Non-Lighting Labeled Products

ID	Comment Summary	EPA's Response	EPA's Policy Decision
233	<ul style="list-style-type: none"> • Multiple respondents noted their support for increased requirements for non-lighting labeled products, due to the added energy that can be saved and the consistency with which the ENERGY STAR brand is applied to ENERGY STAR homes. 	<ul style="list-style-type: none"> • EPA appreciates respondents' support. 	<ul style="list-style-type: none"> • No policy change.
234	<ul style="list-style-type: none"> • In the case of ceiling fans, one respondent noted that the majority of savings come from the light kit, which can be difficult to obtain even when the fan itself is qualified. In light of the separate whole-house lighting requirement, it was suggested that ceiling fans not be required to have a compliant light kit. Otherwise, builders may simply install ceiling fans without any lighting to avoid the requirement. 	<ul style="list-style-type: none"> • EPA believes that the use of efficient ceiling fans is one way to achieve cost-effective energy savings within a home and is therefore an important component to promote within the guidelines. However, EPA agrees with respondents that other upgrade measures can be used in place of qualified ceiling fans without compromising EPA's overall goals for the program. 	<ul style="list-style-type: none"> • EPA will continue to promote efficient ceiling fans in the proposed guidelines. However, it has revised the proposed guidelines by removing them as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require them in the prescriptive path and ENERGY STAR Reference Design, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.
235	<ul style="list-style-type: none"> • One respondent noted that some builders allow homeowners to select their appliances and that limiting their options to ENERGY STAR qualified lighting will be difficult. • Another respondent expressed the concern that many appliances (e.g., refrigerators) don't save enough energy to justify their added cost, even when installed in a new home. • One respondent requested that EPA clarify that the appliances must be ENERGY STAR qualified only when installed in the home by the builder at the time of construction and that appliances that are purchased by the homeowner or brought from a previous home are exempt from this requirement. 	<ul style="list-style-type: none"> • EPA research has demonstrated that all ENERGY STAR products are cost-effective and that the use of efficient appliances is one way to achieve cost-effective energy savings within a home. Therefore, qualified ENERGY STAR qualified appliances are an important component to promote within the guidelines. However, EPA agrees with respondents that other upgrade measures can be used in place of qualified appliances without compromising EPA's overall goals for the program. • EPA's intent was only to require qualified appliances when they are included with the rated home, but agrees with the respondent that this can be further clarified. 	<ul style="list-style-type: none"> • No policy change regarding ENERGY STAR qualified exhaust fans as a mandatory requirement for all qualified homes. • EPA will continue to promote ENERGY STAR qualified dishwashers, refrigerators, and ceiling fans in the proposed guidelines; however, it has revised the proposed guidelines by removing them as a mandatory requirement for all qualified homes. Instead, the revised guidelines only require them in the prescriptive path

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			<p>when such appliances are included in the rated home and require that the ENERGY STAR Reference Design always be configured with the qualified appliances, thereby allowing partners using the performance path to utilize alternative strategies for achieving equivalent savings.</p>
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Water Efficiency Measures

ID	Comment Summary	EPA's Response	EPA's Policy Decision
236	<ul style="list-style-type: none"> • Regarding low-flow showerheads: <ul style="list-style-type: none"> ○ Respondents variously requested that showerheads be required to meet a standard of 1.75 gpm ○ Requested that the requirements be aligned or simply co-branded with EPA's WaterSense program ○ Requested that the requirements not be mandatory because some occupants find low-flow showerheads to be unsatisfactory, and some builders allow occupants to select showerheads and have little control over the efficiency level. 	<ul style="list-style-type: none"> • Based on feedback, EPA acknowledges that there is potential confusion between the proposed EPA ENERGY STAR Qualified Homes guidelines and the new EPA Water Sense labels for hot water efficiency measures. 	<ul style="list-style-type: none"> • EPA has eliminated the requirements for low-flow showerheads and efficient hot water distribution systems from the proposed new homes guidelines to reduce confusion with EPA's new Water Sense guidelines.
237	<ul style="list-style-type: none"> • Respondents also requested that EPA clarify: <ul style="list-style-type: none"> ○ Whether outdoor showerheads are included within the requirements ○ Whether all showerheads must meet the requirement, or if the average flow rate of all showerheads may be used to determine compliance. 	<ul style="list-style-type: none"> • Based on feedback, EPA acknowledges that there is potential confusion between the proposed EPA ENERGY STAR Qualified Homes guidelines and the new EPA Water Sense labels for hot water efficiency measures. 	<ul style="list-style-type: none"> • EPA has eliminated the requirements for low-flow showerheads and efficient hot water distribution systems from the proposed new homes guidelines to reduce confusion with EPA's new Water Sense guidelines.
238	<ul style="list-style-type: none"> • Regarding efficient hot water distribution systems: <ul style="list-style-type: none"> ○ Multiple respondents requested that EPA delay the implementation of this requirement until more precise system specifications can be 	<ul style="list-style-type: none"> • Based on feedback, EPA acknowledges that there is potential confusion between the proposed EPA ENERGY STAR Qualified Homes guidelines and the new EPA Water Sense labels for hot water efficiency measures. 	<ul style="list-style-type: none"> • EPA has eliminated the requirements for low-flow showerheads and efficient hot water distribution systems from the proposed new homes guidelines to reduce confusion

EPA Responses to ENERGY STAR 2011 Qualified New Homes Comments

	<p>established. These specifications may include metrics for maximum allowed contained volume of water and/or a requirement for the speed with which hot water is delivered to fixtures during consecutive use (i.e., “time-to-tap”).</p> <ul style="list-style-type: none"> ○ These respondents also noted that EPA’s WaterSense program is in the midst of developing such standards and that it would be most appropriate to align or co-brand with the resulting guidelines. ○ One respondent noted that motion-activated water circulation pumps are prone to false positives. Suggestions for alternative means of compliance included the use of R-2 pipe insulation or water-sensing shutoff valves to prevent wasted water. ○ One respondent requested that EPA include irrigation systems in their requirements and another requested that EPA clarify why low-flow faucets, low-flow toilets, and water-efficient dishwashers and clotheswashers were excluded from the requirements. 		<p>with EPA’s new Water Sense guidelines.</p>
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