No.	Topic	Comment	EPA Response
1	Implementation Date	Multiple stakeholders want the implementation date to be extended to January 1, 2015 for the following reasons: • There is ongoing weakness in the economy and the housing market in particular. • Manufacturers cannot realistically begin transitioning to the new program requirements until they are finalized. A lead time of approximately 24 months is critical to manufacturers' ability to smoothly plan, produce, and market new products. • This would align with manufacturing cycles and with revisions to the International Energy Conservation Code (IECC).	EPA has already pushed back the estimated implementation date for the Version 6.0 criteria and does not anticipate any further delays. The current ENERGY STAR specification does not meet the 2012 IECC fenestration specifications in some climate zones, so delaying the ENERGY STAR implementation date would cause ENERGY STAR to become irrelevant in large parts of the country as more states adopt IECC 2012. EPA continues to monitor the code process and will make adjustments or revisions to the implementation deadline as necessary. Please note that EPA provided potential criteria ranges and new program elements in the Framework Document, which was published in October 2011, 27 months before the planned implementation date of the Version 6.0 criteria.
2	Implementation Date	Other stakeholders, including some manufacturers, support the proposed implementation date of January 1, 2014, noting that a shorter lead time would help reduce ENERGY STAR market share.	EPA appreciates the support for the proposed implementation date.
3	Specification Language	Several stakeholders suggest replacing the use of 29.8% glazing as the cutoff between > ½-lite and ≤ ½-lite doors with the designation defined by the National Fenestration Rating Council (NFRC) 100 (Table 5-1 on p. 40 of NFRC 100-2010 Technical Document). This avoids confusion.	The Draft 2 Version 6.0 criteria have been modified to reflect the NFRC definitions. (See page 1 of the Draft 2 specification.)
4	Specification Language	A stakeholder suggests that language be added to the specification that clarifies that products must carry the NFRC label.	According to the NFRC, a product is not considered NFRC-certified until it carries the NFRC label, and the ENERGY STAR product specification requires that products must be NFRC-certified to be eligible for ENERGY STAR qualification. (See pages 3 and 5 of the Draft 2 specification.)
5	Specification Language	A stakeholder indicates that it is unclear whether sidelites and transoms are included in the ENERGY STAR program because they can be classified as swinging doors or fixed windows based on dimension.	EPA defines how these products are to be categorized on pages 1-2 of the Draft 1 Version 6.0 specification. The definitions are taken directly from NFRC documents.

No.	Topic	Comment	EPA Response
6	Structural Requirements	Several stakeholders strongly encourage EPA to require structural certification to the North American Fenestration Standard/Specification (NAFS) 101/I.S.2/A440. Most fenestration products are already certified to NAFS and the International Building Code and International Residential Code require testing. Structural performance is directly related to energy savings as an indicator of product quality and assurance of long-term performance. Further, the stakeholders suggest that EPA's installation instructions proposal can be achieved by requiring structural certification. Programs from the Window and Door Manufacturers Association, the American Architectural Manufacturers Association, the National Accreditation & Management Institute, and Keystone Certifications require manufacturers to have installation instructions available.	Based on conversations with NFRC and comments from manufacturers, it is clear to EPA that the addition of Air Leakage (AL) criteria and installation instructions to the program requirements will be quite challenging for the certification body and some manufacturers. Therefore, EPA has elected to leave any additional new program requirements for the next criteria revision, especially since many complex processes and documentation details will have to be considered and addressed before proceeding with a NAFS certification requirement for all ENERGY STAR fenestration products.
7	High Altitude and Impact-Resistance	One stakeholder suggests that there should be a U-factor allowance for impact-resistant products and products installed at high altitude. High Solar Heat Gain Coefficient (SHGC) products receive special treatment, which is inconsistent with EPA's statements about avoiding special treatment for high-altitude or impact-resistant products.	EPA received comments from several stakeholders that they were not concerned about achieving ENERGY STAR qualification with impact-resistant products or with products installed at high altitude. To clarify, the equivalent energy performance criteria (tradeoffs) provided for the Northern Zone are not "special treatment." These products offer equivalent energy performance, which would not be true of any allowances made for impact-resistant or high-altitude products.
8	Impact-Resistance	A stakeholder suggests that EPA not provide an exception to the criteria for impact resistance.	EPA appreciates the support for not allowing an exception for impact resistance.
9	Daylighting	A stakeholder agrees that minimum Visible Transmittance (VT) or VT/SHGC ratios are not necessary at this time.	EPA appreciates the support for not setting a minimum VT or VT/SHGC ratio.
10	Daylighting	A stakeholder suggests that the traditional approach of analyzing energy savings based on product parameters disregards the value of skylights in reducing home energy usage through daylighting and optimizing the distribution of fenestration in homes (reducing the need for windows).	As stated in the Framework Document and the Draft 1 Report (Section 2.2.4), EPA considers daylighting a property that must be evaluated at a room or whole-building level; individual fenestration products cannot truly be evaluated for their daylighting properties.
11	Climate Zones	A stakeholder suggests that the Pacific Northwest region, specifically Seattle and Portland, should not be classified in the same region as North Dakota and Minnesota. The Version 6.0 criteria would require a U-factor far below building codes and is not necessary for the climate.	EPA has found that several utilities in the Pacific Northwest support high-efficiency windows with incentives, which make the products more cost-effective. Additionally, EPA indicated in the framework document (Section III.a.) that the Agency did not plan to revise the climate zone map with the Version 6.0 criteria revision. Changing the map is an expensive undertaking for many manufacturers. EPA plans to revisit the map during the Version 7.0 criteria revision process if warranted by changes to incentive levels and/or local or model code.

No.	Topic	Comment	EPA Response
12	Air Leakage (AL) Criteria	Several stakeholders state that a pass/fail rating for AL neglects significant performance differences among products. They also state that AL is a significant issue, especially in northern climates. They suggest that the criteria should be 0.15 cfm/ft^2.	As outlined in Section 2.4.1 of the Draft 1 Report, EPA's research and analysis indicates that fenestration AL has little impact on whole-home energy savings once it is below 0.5 cfm/ft^2.
13	AL Criteria	Some stakeholders express support for the proposed AL requirement of ≤0.3 cfm/ft^2 for windows and sliding doors and ≤0.5 cfm/ft^2 for swinging doors.	EPA appreciates the support for the proposed AL requirement.
14	AL Criteria	A stakeholder suggests that AL values are valid only with the prerequisite of operating force. EPA needs to ensure that manufacturers do not sacrifice operation in favor of reducing AL.	EPA is matching the AL requirements set in code and focusing on labeling using "≤0.3" or "≤0.5" as appropriate.
15	AL Labeling and Reporting	Several stakeholders suggest that the AL labeling methodology should be consistent with existing procedures and not present additional burden to stakeholders. They also state that the AL requirement should be fulfilled by either compliance with an NAFS label or NFRC AL labeling.	EPA has requested example labels from NAFS certifiers so that it can evaluate the effectiveness of these labels at communicating AL ratings to consumers. To date, no example labels have been received, so EPA cannot consider allowing NAFS certification labels as a proxy for carrying AL on the NFRC temporary label at this time. EPA may reconsider this position if/when it receives example labels from NAFS certifiers.
16	AL Labeling and Reporting	A stakeholder suggests that in addition to displaying "≤0.30" and "≤0.50" on the NFRC temporary label, manufacturers should have the option of including an alternative statement to the same effect, e.g. "AL: Meets or exceeds an AL rate of ≤0.30."	EPA suggests that stakeholders submit additional information as to why such an alternative is necessary or desirable. To clarify, only one significant digit should be reported for AL, per NFRC requirements.
17	AL Labeling and Reporting	A stakeholder comments that the results of AL testing should be included in the CPD, but there should not be any additional procedures or new labels required.	ENERGY STAR requires that the U-factor and SHGC appear in the CPD and on the NFRC temporary label for verification purposes and for consumer reference; for consistency, AL will also be required to appear in the CPD and on the product.
18	AL Labeling and Reporting	A stakeholder states that requiring the reporting of exact AL ratings on the NRFC CPD would add complexity and cost to the documentation practices of manufacturers because AL rates below 0.3 cfm/ft^2 have an insignificant impact on energy performance.	EPA concurs with this assessment, which is why it requires labeling using "≤0.3" or "≤0.5" as appropriate.
19	AL Testing	A stakeholder comments that the conditions specified by NFRC 400 and NAFS are necessary to ensure that testing has been conducted properly, so the requirements should expressly state that the ASTM E238 test method must be conducted in accordance with those conditions.	EPA appreciates this insight and has modified the Draft 2 specification accordingly. (See page 5 of the Draft 2 specification.)
20	AL Testing	A stakeholder suggests that the AL requirements state that the product was "independently tested per NAFS-08 (ASTM E283)" but should not require specific association certification.	EPA requires certification of metrics used as qualification criteria across all ENERGY STAR product categories to better ensure that consumers are receiving the energy-efficient products for which they paid.
21	AL Testing	A stakeholder suggests that testing for AL be conducted on an installed window rather than a laboratory-tested unit.	EPA is unaware of any in-situ AL testing that can be certified by a third party, which is a requirement of all ENERGY STAR qualified products. Additionally, on-site testing typically reflects installation technique rather than product performance. Proper product installation testing goes beyond the current scope of the ENERGY STAR windows program.

No.	Topic	Comment	EPA Response
22	Installation Instructions	A stakeholder states that it is not feasible to list all of the hardware and tools that might be required in all the varying replacement and removal conditions.	EPA does not expect the list of hardware and tools to be exhaustive. Manufacturers may add any disclaimer language they consider necessary.
23	Installation Instructions	Several stakeholders comment that the proposed requirement to address proper management of lead paint is unnecessary because of the existing Lead Renovation, Repair, and Painting (LRRP) standards. Requiring manufacturers to further address lead in installation instructions is redundant, and it potentially exposes manufacturers to liability risks in the event of unintended conflicts between their instructions and the LRRP Rule. Any LRRP information should be developed by and solely attributable to EPA. Manufacturers should just have to provide a link to the EPA LRRP website.	EPA proposed the requirement to ensure that manufacturers mentioned lead paint management when applicable. To make this intent clearer, EPA has modified the lead paint language in the Draft 2 specification. Providing a link to the EPA lead website (www.epa.gov/lead) would be sufficient for meeting this requirement. (See page 4 of the Draft 2 specification.)
24	Installation Instructions	A stakeholder points out that item 4 in the installation instructions requires detailed flashing instructions but many replacement applications do not allow an opening to be flashed. Flashing should be a recommendation, not a requirement.	EPA understands that some installation scenarios may prevent the use of flashing and has modified this portion of the specification accordingly. (See page 5 of the Draft 2 specification.)
25	Installation Instructions	A stakeholder comments that the installation instruction requirements are best achieved through scan codes and web portal information affixed to each window.	EPA encourages manufacturers to pursue whatever method they choose for meeting the new installation instructions requirement.
26	Installation Instructions	A stakeholder comments that it is not feasible to ask NFRC accredited test labs to review and approve manufacturers' instructions as part of IVP.	EPA will not be asking NFRC test labs to "review" or "approve" installation instructions. Rather, EPA plans to require a checklist item in the verification program, which will verify the presence of installation instructions.
27	Installation Instructions	Multiple stakeholders comment that installation instructions should be required only for "typical" products and situations. Manufacturers do not and cannot have readily available instructions for every situation or condition that might arise.	EPA appreciates this insight and has modified the specification language accordingly. (See page 4 of the Draft 2 specification.)
28	Installation Instructions	Multiple stakeholders suggest ways that EPA could further ensure product quality. • One comments that written installation instructions are a limited first step toward a broad-based quality assurance program including training and certification for installers, follow-up checks, and consumer warranties. • Another suggests that installation instructions should be provided with the product and the procedure verified by the inspection agency that visit ENERGY STAR partners each year. ENERGY STAR should also promote the use of certified installers. • Another states that educating consumers about the importance of proper installation can help spur demand for quality installation. Certification and training requirements may help establish standards by employing third-party checks. Installation requirements for HVAC may serve as a possible model.	EPA appreciates the suggestions regarding installation instructions and may consider these ideas in the future. EPA encourages industry to develop the necessary standards for inspection, certification, and enforcement processes, which would better enable EPA to educate homeowners about these issues and/or add new ENERGY STAR program requirements as appropriate.

No.	Topic	Comment	EPA Response
29	Installation Instructions	One stakeholder points out that the mention of preventing water leakage in the 'Guidance on sealing' section of the installation instructions requirement contradicts the lack of requirements for structural certification.	EPA has clarified this language in the Draft 2 specification; the intent was to focus on preventing water leakage at the product-wall interface, not through the product itself. (See page 5 of the Draft 2 specification.)
30	Installation Instructions	A stakeholder suggests that guidance on disposal or recycling should be included under the 'removing old products' requirements.	EPA has added this to the specification. (See page 4 of the Draft 2 specification.)
31	Installation Instructions	Several stakeholders comment that these requirements would add significant administrative burden to EPA and manufacturers. The requirement should be to make installation instructions readily available online or packaged with the product, and not specify the content of those instructions. The requirements are ambiguous about what constitutes compliance.	EPA plans to require a checklist item in the verification program to verify the existence of installation instructions. EPA will not be checking every item listed in the installation instructions requirement for “compliance.” The requirements are written to allow flexibility.
32	Installation Instructions	A stakeholder comments that the language in the installation instructions referring to "safely removing old products" and "proper management of lead paint" puts the manufacturer in a position of having to assume liability for the existing door or window. Specification section 3.D.iii should read: "General guidance on preparing the frame for installation."	EPA encourages manufacturers to add to the installation instructions whatever disclaimer language they consider necessary.
33	Window Criteria	A stakeholder strongly urges EPA to work cooperatively with industry to develop suitable qualification criteria to recognize dynamic glazing products for their efficiency benefits.	EPA is concerned about how consumer behavior affects the energy performance of dynamic products and has discussed these concerns with the dynamic glazing industry. EPA will continue to discuss options with stakeholders and evaluate new research as it becomes available.
34	Window Criteria	Some stakeholders state that the U-factor maximum should be set at 0.25 in the Northern Zone because fourth surface glass products are widely available.	EPA is appreciative of this feedback; however, the 0.27 U-factor maximum proposed for the Northern Zone was based on careful consideration of several factors (including current codes, current market share, and stakeholder feedback) and multiple analyses (including product feasibility, product availability, and cost-effectiveness). This analysis is explained in Section 3 of the Version 6.0 Draft 1 Criteria and Analysis Report. During the Version 7.0 criteria revision process, EPA will reevaluate these factors and perform new analyses to determine what specification level is most appropriate.
35	Window Criteria	Several stakeholders comment that the current mean and median SHGC are 0.22, which indicates that manufacturers are limiting their inventories to single SHGC products that can be sold in all four climate zones.	To clarify, the cited SHGC mean and median are for the CPD and Products Available for Sale Analysis, not for unit window sales. As stated in the Draft 1 Report on page 27, the SHGC of manufacturers’ best-selling ENERGY STAR qualified product is 0.28, which does not allow the product to qualify in all four zones.

No.	Topic	Comment	EPA Response
36	Window Criteria	Several stakeholders comment that: • Adding a 0.35 minimum SHGC to the northern criteria would double aggregate energy savings in the Northern Zone. • A minimum SHGC in the Northern Zone is critical to the continued credibility of the ENERGY STAR Program. Allowing any SHGC in the Northern Zone reduces the availability of high SHGC products, misleads consumers, and results in greater energy consumption	EPA's proposed approach to addressing SHGC in the Northern Zone is consistent with the approach used in both the IECC and previous ENERGY STAR window specifications. However, EPA has now added two additional equivalent energy performance criteria (trade-offs) to Draft 2 of the proposed specification to address stakeholder concerns. EPA believes that establishing a minimum SHGC in the Northern Zone will require additional analysis and has already begun evaluating the possibility of including a minimum SHGC in the Version 7.0 specification. Further, note that EPA has included a minimum SHGC criterion in the Most Efficient program for 2013.
37	Window Criteria	Several stakeholders state that EPA's allowance of any SHGC in the Northern Zone is antithetical to the purpose of the ENERGY STAR program in helping people make informed decisions.	To clarify, the primary focus of the ENERGY STAR program is to help consumers save money and protect the environment through energy efficient products and practices. The proposed U-factor in the Northern Zone will offer energy savings. EPA plans to develop guidance to help consumers understand the benefits and limitations of high- and low-gain fenestration products. Further, EPA has expanded equivalent energy performance criteria in the Northern Zone to recognize the potential benefits of high-gain windows.
38	Window Criteria	Several stakeholders comment that setting the U-factor at 0.27 will not significantly reduce market share because it will permit window manufacturers to continue selling the same windows.	EPA found in its research that the U-factor of manufacturers' best-selling window is 0.30, which indicates that there should be some market share decline with U-factor levels below 0.30 in two of the four climate zones.
39	Window Criteria	Several stakeholders warn that a 0.27 U-factor will be overtaken by the IECC 2015, possibly with a Northern Zone U-factor requirement as low as 0.25 or 0.20.	If the DOE proposal for the IECC is accepted in 2013, EPA will reconsider the ENERGY STAR criteria.
40	Window Criteria	Several stakeholders comment that a U-factor requirement of 0.40 in the Southern Zone would exclude aluminum windows. The lack of balance between the proposed criteria for the Northern Zone and Southern Zone will negatively impact the market for aluminum frame windows.	EPA believes that the ENERGY STAR specification for the Southern Zone needs to at least meet the U-factor minimum set by IECC 2012 for the program to remain meaningful in that zone.
41	Window Criteria	One stakeholder comments that the use of a dual insulating glass (IG) unit that uses low-e on surfaces 2 and 4 can lead to condensation on the glass because it results in inside glass surface temperature about 10 degrees cooler than a standard IG unit. EPA should implement a minimum NFRC condensation rating at least as good as the current average for a dual glazed window (about 60) to ensure that quality isn't harmed by new criteria. The CPD includes condensation ratings for all glazing options, so this would not pose additional burden to manufacturers.	At this time, EPA does not plan to institute a condensation resistance requirement or otherwise introduce new program criteria specifically aimed at fourth surface products. EPA believes that proper consumer education at the time of sale can address any issues that may arise from this technology. Additionally, EPA learned at the most recent NFRC Membership Meeting that NFRC will be developing a "Condensation Index" rating in hopes of developing a metric that is more useful when evaluating how likely fenestration products are to develop condensation. EPA will continue to monitor these efforts.

No.	Topic	Comment	EPA Response
42	Window Criteria	Several stakeholders state that condensation on fourth surface products is not an issue. The surface temperature of fourth surface products is at least 4 degrees warmer at the center of the glass than double pane clear glass with 1/2" airspace. Condensation can form in some situations, but it will occur regardless of whether fourth surface products are used.	EPA appreciates the feedback on this issue. EPA has received comments on both side of this issue and is monitoring the progress of a condensation study on fourth surface products.
43	Window Criteria	A stakeholder comments that an equivalent energy performance option should be included for the Southern Zone, with lower SHGCs offsetting U-factor increases.	EPA cannot permit such tradeoffs because doing so would result in ENERGY STAR products that do not meet code (IECC 2012).
44	Window Criteria	Several stakeholders recommend that in addition to the equivalent energy performance allowances for the Northern Zone, EPA should allow U-factor of 0.29 paired with SHGC ≥0.37, and U-factor of 0.30 paired with SHGC ≥0.42.	EPA has added the two additional tradeoffs to the Draft 2 Version 6.0 specification. (See pages 4 and 6 of the Draft 2 specification.)
45	Window Criteria	Multiple stakeholders support the goal of an ENERGY STAR market share of 25%-30%. One stakeholder comments that U-factor criteria of 0.25-0.27 are needed to ensure that ENERGY STAR products are among the best at reducing energy consumption.	EPA appreciates the support for its efforts to reduce market share. EPA notes, however, that the Agency also uses other indicators to determine when and at what level to set specifications, e.g., product feasibility, product availability, current codes, and cost-effectiveness.
46	Window Criteria	One stakeholder comments that the U-factor for the Southern Zone and SHGC for the Southern and South-Central Zones are the same as the 2012 IECC criteria, which may make it difficult for utilities to justify offering rebates.	EPA recognizes that the IECC 2012 U-Factor of 0.40 is a significant tightening of the criteria, which will present a challenge for many manufacturers, and does not intend to propose a more stringent level. Some stakeholders expressed concern during the previous criteria revision that setting an SHGC requirement below the IECC 2012 level of 0.25 in the Southern and South-Central Zones could result in lower visible transmittance. ENERGY STAR will be offering a Most Efficient program in 2013 which utilities can use as a basis for rebate programs.
47	Window Analysis	One stakeholder states that EPA's analysis of products available for sale is a de facto delegation of decision making authority from EPA to a select group of window manufacturers.	EPA points out that the Products Available for Sale Analysis was not the only data set used to select the Draft 1 criteria. In addition to the Products Available for Sale Analysis, EPA performed industry research, household saving analysis, feasibility analysis, stakeholder outreach, model building code research, state code adoption research, and cost-effectiveness analysis to select the Draft 1 criteria. EPA also reviewed and used aggregate national savings analysis performed by Lawrence Berkley National Laboratory (LBNL) and ENERGY STAR market data collected by Ducker Worldwide when selecting the Draft 1 criteria.
48	Window Analysis	Several stakeholders comment that EPA's products available for sale analysis skews product "availability" in favor of national window manufacturers who have a strong interest in single, nationwide SHGC criteria.	EPA's intent with the Products Available for Sale Analysis was to collect data on widely available products that were reasonably representative of windows sold in the marketplace. According to market research, the top 20 manufacturers account for approximately 80% of window sales.

No.	Topic	Comment	EPA Response
49	Window Analysis	Several stakeholders comment that EPA's products available for sale analysis accounts for only 2.5% of entities involved in the manufacture of windows and doors.	EPA recognizes that the Products Available for Sale Analysis accounts for a small percentage of entities involved in the manufacture of windows and doors, but the manufacturers selected for the analysis are responsible for approximately 80% of all window sales. As such, their marketed products were considered sufficiently representative of products widely available to consumers. At the same time, EPA evaluated products from all NFRC participants (not just ENERGY STAR partners) to evaluate potential feasibility and complement the Products Available for Sale Analysis.
50	Window Analysis	Several stakeholders state that EPA assumes that 100% of the windows are sold by the top 100 window makers listed in Door & Window magazine.	EPA recognizes that not all windows are sold by the top 100 manufacturers. ENERGY STAR for Windows, Doors, and Skylights has more than 400 partners and NFRC has more than 800 participants. According to market research, the top 20 manufacturers account for approximately 80% of window sales.
51	Window Analysis	Several stakeholders state that EPA's Products Available for Sale Analysis ignores the fact that high SHGC glass is readily available from five different US primary glass manufacturers.	EPA is appreciative of this feedback; however, availability of components is different from availability of products. Therefore, EPA's research focused on windows currently certified by NFRC (an ENERGY STAR program requirement) and on windows currently available for sale as viable options under the new criteria.
52	Window Analysis	Several stakeholders state that while EPA notes that there are 4,562 products in the NFRC CPD with a U-factor less than 0.27 and an SHGC greater than 0.32, EPA is ignoring the many thousands of high-gain solar products that are found in Natural Resources Canada's (NRCan's) windows database. Windows available in Canada are readily available in the United States, especially in the Northern Zone.	EPA did not include products from the NRCan database in the feasibility analysis because the U.S. ENERGY STAR program requires product certification through NFRC. ENERGY STAR Canada does not require NFRC certification for its products. To clarify, the purpose of the Products Available for Sale Analysis was to identify the products that top manufacturers are actively marketing in the United States, which would not have been accomplished by including products listed in a Canadian database. Additional details on the purpose and methodology of both the feasibility and availability analyses are available in Section 3.2 of the Draft 1 Report.
53	Window Analysis	A stakeholder comments that EPA relies too heavily on product information contained in the CPD and assumptions of availability based on what some manufacturers offer in their portfolios. There are 25% more products listed on the CPD than the actual number of units available for sale, so assumptions and conclusions based on the CPD are invalid.	EPA is limited in what data it can use for analysis. For this reason, EPA primarily relied on the CPD to evaluate product feasibility and approximated product availability based on what manufacturers are marketing on their websites. EPA did not use the CPD to estimate the number of products available for sale; instead it used the CPD only to determine what products could feasibly be manufactured.
54	Window Analysis	One stakeholder comments that data from 2009-2010 sales should not be used as a basis for the criteria revisions because of the 30% tax credit offered at the time as part of the stimulus.	EPA uses market share, not unit sales numbers, to evaluate when the criteria need to be revised. ENERGY STAR market share declined just 3% after the amount of the tax credit was reduced from $1,500 to $200.

No.	Topic	Comment	EPA Response
55	Window Analysis	One stakeholder comments that the market share of aluminum windows was grossly underestimated. The CPD and Top 20 data are skewed to include a smaller share of aluminum windows, which make up a significant share of the market in the south. Ducker estimates a total market share of 8.1%, with a 35% share in Florida. Aluminum windows will be adversely affected by the proposed criteria, so the statement that consumer choice will not be reduced significantly is not correct.	EPA appreciates this clarification; the term “market share” was inappropriately applied in the section cited. However, ENERGY STAR cannot set a U-factor minimum that is less stringent than IECC 2012 in the Southern Zone.
56	Window Analysis	A stakeholder comments that payback studies do not account for the fact that energy costs rise faster than the rate of inflation, resulting in better payback periods for windows.	EPA chose to retain flat energy costs as a conservative assumption for the energy savings analysis, as has been done in the previous criteria revisions.
57	Window Analysis	A stakeholder comments that "Window 311," used in the North-Central, South-Central, and Southern Zone analyses, is not representative of the large number of single pane windows installed in these climate zones.	ENERGY STAR cost-effectiveness is determined by evaluating the cost and performance difference between a code product and an ENERGY STAR product, not the difference between a consumer’s current product and an ENERGY STAR product.
58	Window Analysis	One stakeholder comments that EPA's cost-effectiveness analysis is based on replacing single or double clear windows, but this does not apply to new construction, where products comply with ENERGY STAR or 2009 IECC.	EPA’s cost-effectiveness analysis was based on the incremental cost between ENERGY STAR and code. Please refer to Sections 3.3.1 and 3.3.3 of the Draft 1 report.
59	Window Analysis	One stakeholder comments that the costs of higher performing products, with a U-factor ≤0.27, have been overstated by manufacturers. A PNNL report on the R5 program found that more than 13,000 windows had been sold with an average price of about $240 per window, which is in line with the current average price of ENERGY STAR windows on one big box retailer’s website.	EPA would be interested in reviewing the PNNL report referenced and invites stakeholders to share the report. Based on manufacturer feedback, EPA notes that big box retailer website prices are more indicative of products with lower price points, and not representative of the current average price of ENERGY STAR products.
60	Window Analysis	One stakeholder comments that EnergyGauge and RESFEN runs in 10 cities in Zone 2 show an average energy cost savings of only $21 per year, and zero or negative energy savings in Zone 1, contrary to the $98-194 per year savings estimated in EPA’s Draft 1 Report.	It is unclear to EPA what data and assumptions were used to determine the results of the stakeholder. EPA has provided the assumptions and inputs necessary to duplicate its energy cost savings analysis. Stakeholders may contact EPA if they need additional information.
61	Window Analysis	One stakeholder comments that efficiency requirements for fenestration have reached levels of diminishing returns, especially in the Northern Zone. EPA found the V6.0 criteria would save 2.2 trillion Btu, or only 1/4 the savings of 2009 criteria. The savings in the Northern Zone would be only 0.53 trillion Btu.	EPA selected more conservative assumptions for the most recent aggregate energy savings analysis, so the two results are not directly comparable.
62	Window Cost Effectiveness	One stakeholder comments that EPA's cost estimate does not seem to include the cost of adding a thermal break to aluminum windows. Cost calculations based on data from only 8 manufacturers significantly underestimates average incremental and marginal cost increases. The assumption that fourth surface coatings or triple pane is not necessary is not true in many cases. Analysis of cost-effectiveness in the Northern Zone must include triple pane windows.	EPA notes that it performed cost analyses on all data volunteered by manufacturers. EPA welcomes additional cost data from manufacturers. EPA did not assume that fourth surface or triple-pane IGUs would not be necessary, but no manufacturers volunteered cost data for fourth surface products and EPA hopes to improve double-pane performance with the Version 6.0 criteria. Double-pane windows will be a more cost-effective option for most manufacturers, other than those that are already successfully selling triple-pane windows.

No.	Topic	Comment	EPA Response
63	Window Cost Effectiveness	Multiple stakeholders comment that the average payback periods in the Northern Zone do not represent reasonable, consumer-acceptable time periods. Meeting proposed criteria in the Northern Zone would require significant product redesign, including triple-panes, chassis redesign, and IG spacer retooling. These changes are not cost-effective, resulting in payback periods of 11-13 years that are unacceptable to consumers and impose significant risks on manufacturers. One stakeholder comments that a payback period of 5-7 years is needed to conform to the expectations and means of consumers. Another suggested that a payback of 7-10 years is reasonable. The NAHB uses a payback period of 10 years to determine cost-effectiveness.	EPA understands that there are many different viewpoints on what constitutes a "reasonable" payback period. Due to the long life of fenestration products, EPA believes that payback within the lifetime of the product represents a reasonable payback period. EPA also understands that payback periods will vary based factors from the individual house to the manufacturer's production costs. As a national program, ENERGY STAR must make some basic assumptions to evaluate and set criteria.
64	Window Cost Effectiveness	A stakeholder comments that the U-factor in the North-Central Zone should be 0.30. The proposed criteria require significant product redesign with minimal benefit to consumers. This 0.01 difference increases energy savings by 0.16 trillion Btu (7.2% of total savings), but costs an additional $112 million, resulting in a 38.9 year payback. Setting the criteria at 0.30 generates more than $37 million in annual energy savings over V5.0 with virtually no incremental cost.	EPA's cost-effectiveness analysis found the payback period in the North-Central Zone to be much shorter (13-20 years). EPA welcomes any additional cost data that manufacturers would like to volunteer.
65	Future Criteria Development	Several stakeholders state that the current level of interaction between EPA and the fenestration industry (including a stakeholder meeting, proposals, and comment periods) is vital in maintaining a program that is beneficial to consumers and equitable to manufacturers. Complexity in the fenestration industry based on different applications and climate zones warrants an involved process.	EPA appreciates the input and intends to continue its dialog with industry.
66	Future Criteria Development	A stakeholder recommends that EPA continue to monitor the 2015 IECC process to determine if a shorter timeline for ENERGY STAR V7.0 is warranted if code requirements approach or surpass V6.0. Future criteria should place more emphasis on SHGC in the Southern and South-Central Zones and not focus on the need for a stringent U-factor (like 0.20).	EPA appreciates the input and plans to continue monitoring the IECC development process.
67	Future Criteria Development	One stakeholder comments that industry and EPA should create a tiered program for Version 7.0 where the current specification would be kept for a "bronze" ENERGY STAR. This could solve the conflict between maintaining affordability and promoting new technology that threatens the future of ENERGY STAR.	EPA appreciates the feedback and will accept comments on the Version 7.0 specification after the publication of the Version 7.0 framework document.

No.	Topic	Comment	EPA Response
68	Door Criteria	Several stakeholders comment that the > and ≤ ½-lite U-factor requirements are not consistent. A qualifying insulating glass unit on a full-lite does not meet the proposed criteria in a ½-lite. Consumers may need to purchase glazings with different tints or different doors entirely to meet the ENERGY STAR requirements for all doors. Specifically, a soft coat and argon fill are required for a ½-lite to achieve a U-factor of 0.23. Some stakeholders suggest a U-factor requirement of 0.25 for ½-lite doors is needed to permit the same glass in different door types. Another suggests a maximum U-factor of 0.26 is needed to keep the criteria proportional between door types.	EPA appreciates the additional insight on this issue and has modified the ≤ ½-lite U-factor requirement to ≤ 0.25.
69	Door Criteria	Several stakeholders suggest increasing the SHGC requirement for full-lite doors. The proposed SHGC criteria of 0.25 will require many door products to have glazing with a triple silver low-e coating. In cases where a door needs to meet a lower SHGC requirement than the surrounding windows, the glazing colors will not match. To match glazing in the Northern Zone, windows would need to forego energy savings from passive solar heating. In addition, most doors are shaded by overhangs and thus high SHGC values will not significantly affect energy consumption in southern climate. Some stakeholders suggest a maximum SHGC requirement of 0.30 for full-lite doors; others suggest a maximum of 0.27.	EPA appreciates the stakeholder insight and product samples submitted with regard to this issue. In the Draft 2 specification, EPA is proposing two zonal SHGC requirements for > ½-lite doors to address this issue. (See pages 3 and 6 of the Draft 2 specification.)
70	Door Criteria	Some stakeholders suggest differentiating the door requirements by climate zone or applying the window criteria to full-lite doors or just sliding glass doors.	EPA has received mostly positive feedback from manufacturers for creating a separate, whole-country criteria for doors; however, the Draft 2 criteria do include zonal SHGC requirements for > ½-lite doors. (See pages 3 and 6 of the Draft 2 specification.)
71	Door Criteria	One stakeholder comments that changes to the criteria for opaque and full-lite doors will offer no additional energy savings and will damage affordability. Stakeholders estimate that the cost to meet the proposed requirements will be double that of EPA's estimate for ½-lite doors. The payback period is not reasonable.	EPA estimated payback on all data volunteered by manufacturers. If manufacturers wish to submit additional cost data, EPA would welcome the additional data.
72	Door Criteria	One stakeholder recommends modifying maximum U-factor requirements to ≤ 0.19 for opaque doors, ≤ 0.25 for ≤ ½-lite doors, and ≤ 0.30 for > ½-lite doors to maintain a consistent 0.02 change across all categories and allows for the same glass usage.	EPA has revised the ≤ ½-lite U-factor specification to ≤ 0.25 and has already proposed a ≤ 0.30 U-factor for > ½-lite doors. Feedback received from manufacturers indicates that their best-selling opaque doors already achieve a 0.17 U-factor. (See pages 3 and 6 of the Draft 2 specification.)
73	Skylights Criteria	One stakeholder states that EPA does not justify the differences in the proposed SHGC criteria between windows and skylights in the northern zones.	EPA is concerned about heat gain and possible consumer discomfort, especially in the summer months, because skylights receive more direct sun than windows.
74	Skylights Criteria	A stakeholder comments that any skylight made using identical materials as qualifying double-hung windows should qualify under the final skylight criteria.	EPA sees skylights as significantly different from windows. Skylights are tested differently, require stronger frames, and may require tempered glass.

No.	Topic	Comment	EPA Response
75	Skylights Criteria	A stakeholder comments that SHGC criteria for skylights in the two southern zones should be higher than for windows for the following reasons: • Sloped installation results in a higher measured SHGC than the same product in a vertical orientation. • 2012 IECC set the SHGC for skylights at 0.30. • In many applications, reducing SHGC does not result in better energy performance.	• EPA expects skylights to have higher SHGC due to the direct sun they receive. • EPA seeks to exceed the 2012 IECC SHGC requirement set for skylights. • EPA seeks to set criteria that can deliver energy savings in typical residential skylight applications. It is not clear from the stakeholder's comments in what applications lower SHGC does not result in better energy performance in the two ENERGY STAR southern zones or at what frequency these applications occur.
76	Skylights Criteria	One stakeholder states that payback periods of the proposed criteria are not cost-effective, especially in the southern zones. Because skylights are discretionary purchases, price increases of $20-40 over currently qualified products will drive customers away from ENERGY STAR.	EPA sees the low energy savings as a greater contributor to the longer payback periods for skylights. A smaller shift in the criteria would have resulted in even smaller energy savings for these products.
77	Skylights Criteria	A stakeholder suggests that the proposed specification dramatically and disproportionately affects curb-mount products.	ENERGY STAR qualification is driven by overall performance within a product category, wherever possible. Cost-effectiveness, broad availability, and ability to qualify are evaluated at the product level, not the product subtype level. EPA realizes that many curb-mounted skylight products may no longer qualify for the program but the performance of these products are highly dependent on the performance of the curbs and assumptions made in the simulation of the curb during certification. EPA suggests that industry work to improve curbs and the corresponding test procedures so the products perform better overall.
78	Skylights Analysis	One stakeholder comments that data sets for determining cost effectiveness were more limited for skylights than for windows.	EPA evaluated all cost data volunteered by manufacturers. No other cost data sets were available at the time and no additional data sets have been volunteered. If manufacturers wish to submit additional cost data, EPA would welcome the additional data.
79	Skylights Analysis	Distinct sub-types of skylights were not individually studied by EPA. Since the windows analysis focused on the least efficient subtype, skylights should receive the same treatment. Stakeholders suggest using venting curb-mounted skylights as a surrogate.	EPA evaluated all skylight product types because of the relatively small dataset available for these products. EPA had to limit the windows analysis because of the large quantity of data involved. EPA would have used the entire windows data set when selecting criteria, but that approach was not feasible.
80	Skylights Analysis	One stakeholder comments that EPA has not justified the availability assumptions for skylights as was done for windows in Section 3.2.2 of the analysis.	EPA refers stakeholders to Section 5.2.2 and notes that a correlation study was not performed for skylights because data on products available for sale was collected from all skylight manufacturers that had such data available on their websites, not a subset of manufacturers as was done for windows.
81	Skylights Analysis	One stakeholder comments that clarification is needed on the modeling tool used to determine if it accurately assessed energy impacts of skylights at NFRC standard slope.	EPA refers stakeholders to Section 5.3.3, Table 19, and the corresponding footnotes, which outline all assumptions and identify RESFEN 5.0 as the modeling tool used in this analysis.

No.	Topic	Comment	EPA Response
82	Skylights Analysis	One stakeholder comments that the CPD is not very useful as a surrogate for "broad availability." The fenestration market is very regional in nature, with less than 1% of products sold over the Internet.	EPA did not use the CPD as a surrogate for availability. CPD data was used to evaluate technological feasibility.
83	Skylights Analysis	One stakeholder comments that the share of skylights with any glazing material is no more than 60%, not 70%. Because the market share is lower for skylights than for windows, the criteria change should be less stringent.	EPA recognizes that skylight market share is lower than windows, but notes that both products have high market share.
84	Tubular Daylighting Devices (TDDs)	A stakeholder points out that some modifications to the only available U-factor test apparatus have resulted in 60%-90% increases in U-factor ratings. SHGC ratings will likely be affected as well. As a result, there are products with extremely low U-factor ratings on the CPD. Based on product designs and testing, dual pane diffuser designs should not be able to achieve a U-factor below 0.50. Triple pane diffusers may achieve a U-factor below 0.50, but any reported U-factors below 0.40 should be suspect. The proposed criteria would prevent any TDDs from obtaining ENERGY STAR qualification.	EPA appreciates stakeholders bringing this issue to light and will continue to monitor the situation as manufacturers work to resolve this issue with NFRC. Before it can consider revising the specification, EPA will need to collect additional data and information.
85	TDDs	Several stakeholders recommend that TDDs should have their own category with unique performance requirements. TDDs are often used where no other fenestration product is feasible and provide significant energy savings from daylighting that are not considered. The small area of TDDs means the actual Btu losses associated with the products are small, even for products with a high U-factor. TDDs also undergo physical testing methodologies that differ from traditional skylight products. NFRC is developing new performance metrics for TDDs. One suggestion is that a TDD be considered qualified if it uses a dual diffuser at ceiling level, meets an AL requirement of 0.3 cfm/ft^2, and meets the component material requirements in the NAFS Specification.	EPA may consider providing a separate category and criteria for TDDs, but at this time there is not enough data or information regarding TDD testing issue to make a decision. EPA appreciates the submission of an alternative approach, but notes that ENERGY STAR sets specifications based on energy performance criteria, not design or technology used.
86	Other	One stakeholder comments that EPA should consider general environmental impacts of building materials when developing criteria. Recyclable and sustainable materials reduce landfill waste and other impacts related to manufacturing, transportation, and disposal.	EPA has opted to keep the ENERGY STAR program focused on minimizing energy use during a product's in-use phase; other programs are available that address other portions of a product's lifecycle.
87	Other	One stakeholder comments that EPA should consider providing guidance to consumers and contractors about where to install low vs. high SHGC windows. SHCG tradeoffs can be problematic if there is no distinction between shaded and unshaded facades.	EPA intends to expand its consumer guidance on high- versus low-gain windows to help educate consumers on the benefits and limitations of the two options.

No.	Topic	Comment	EPA Response
88	Other	One stakeholder comments that while the market share of ENERGY STAR windows has increased since 2006, the total number of ENERGY STAR windows sold has declined. If EPA achieves its goal of a 25% market share by 2017, consumers will be buying fewer ENERGY STAR windows than they did in 2001. Significant savings on a national scale will not be realized if the criteria encompass only the top 25% of the market.	EPA's goal with ENERGY STAR is to achieve market transformation through increased efficiency for all products on the market. By improving the overall efficiency of products on the market, ENERGY STAR has a much more significant impact on national savings than if its primary goal were to increase unit sales of ENERGY STAR qualified products.