

ENERGY STAR®. The simple choice for energy efficiency.



NATIONAL AWARENESS OF ENERGY STAR® FOR 2015

ANALYSIS OF CEE HOUSEHOLD SURVEY



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EXECUTIVE SUMMARY

In the fall of 2015, members of the Consortium for Energy Efficiency (CEE) sponsored the sixteenth national household survey of consumer awareness of ENERGY STAR. Each year, the survey objectives have largely been the same: to collect national data on consumer recognition, understanding, and purchasing influence of the ENERGY STAR label, as well as data on messaging and product purchases. CEE members may choose to supplement the national sample by adding additional data points in order to assess label awareness in their local service territories.

This report discusses the results of the CEE 2015 ENERGY STAR Household Survey, building on prior years' survey results and focusing on the extent to which consumers recognize the ENERGY STAR label, understand its intended messages, and utilize (or are influenced by) the label in their energy-related purchase decisions. Research questions of interest included:

- Where do consumers see or hear about the ENERGY STAR label?
- How does increased publicity affect recognition, understanding, and influence of the ENERGY STAR label?
- Which key messages about the ENERGY STAR label are consumers retaining?
- Do consumers demonstrate loyalty to the ENERGY STAR label?

Key Findings at the National Level

- Eighty-three percent of households in 2015 compared with 81 percent in 2014 have seen or heard of the ENERGY STAR label (without visual aid).
- Eighty-eight percent of households recognized the ENERGY STAR label when shown the label. This is similar to the 89 percent finding in 2014.
- Households continue to show a high understanding of the ENERGY STAR label. Seventy-six percent of households had a high understanding of the ENERGY STAR label in 2015, similar to 75 percent in 2014. Eighty-five percent of households had at least a general understanding of the label in 2015; this result was eighty-four percent in 2014.
- Among all households, 46 percent knowingly purchased an ENERGY STAR-labeled product in the past 12 months.
- Of households that recognized the ENERGY STAR label (aided) and purchased a product in a relevant product category within the past 12 months, 77 percent purchased an ENERGY STAR-labeled product. This proportion remained at 75 percent since 2012.
- More households in 2015 reported being “very much” influenced by the label after

recognizing it and purchasing an ENERGY STAR-labeled product compared to 2014 (52 percent and 43 percent, respectively).

- Seventy-eight percent of households that recognized the label and purchased a product in a category where ENERGY STAR-labeled products are an option were likely to recommend ENERGY STAR-labeled products to a friend; 33 percent of these households reported that they were “extremely likely” to recommend ENERGY STAR-labeled products. Both findings are similar to 2014.
- In 2015, 68 percent of households associated the ENERGY STAR label with “energy efficiency or energy savings,” this was an increase from 63 percent in 2014.”
- Respondents were asked to rate their satisfaction on a scale of 1 to 5, where 1 means “very dissatisfied” and 5 means “very satisfied.” Overall customer satisfaction with ENERGY STAR labeled products was higher (4.2) than for non-ENERGY STAR labeled products (3.9).

Key Findings from Publicity-Level Analyses

High-publicity areas are defined as having a locally sponsored energy-efficiency program [sponsored by a utility, state agency, or other organization] that has actively and continuously promoted ENERGY STAR for two or more years.

- Eighty-five percent of households in high-publicity areas recognized the ENERGY STAR label without a visual aid compared to 80 percent of households in non-high-publicity areas; this difference is significant at the 10-percent level. After being shown the label (aided), the same percent of households in high and non-high-publicity areas recognized the label, 88 percent for both publicity areas.
- Significantly more households in non-high-publicity areas associated the ENERGY STAR label with water heaters (64 percent), windows (51 percent) and heat pumps (25 percent), when prompted, compared to high-publicity areas, where 57 percent of households associated the ENERGY STAR-label with water heaters, 44 percent associated the label with windows, and 16 percent associated heat pumps with the label.
- A significantly larger proportion of households in high-publicity areas (78 percent) than non-high-publicity areas (72 percent) exhibited a high degree of understanding of the ENERGY STAR label. Eighty-seven percent of households in high-publicity areas had at least a general understanding of the label compared with 82 percent of households in non-high-publicity areas; this difference is significant at the 5-percent level.
- Seventy-one percent of the households in high-publicity areas and 66 percent of the households in non-high-publicity areas associated the ENERGY STAR label with “efficiency or energy savings.”

- The proportion of households that heard or saw something about ENERGY STAR from displays in stores was significantly larger in high- than non-high-publicity areas (56 percent and 42 percent, respectively).

Conclusions

This sixteenth national study of household awareness of the ENERGY STAR label confirms key findings from the previous years' surveys:

- Substantial portions of U.S. households in the surveyed population recognize, understand, and are influenced by the ENERGY STAR label.
- A large proportion of households consistently associate the label with energy efficiency and saving energy.
- The proportion of households that exhibit only a general understanding of the label is small (9 percent) compared with the proportion of households that exhibit a high understanding (76 percent).

INTRODUCTION

In the fall of 2015, members of the Consortium for Energy Efficiency (CEE) sponsored the sixteenth national household survey of consumer awareness of ENERGY STAR. Each year, the survey objectives have largely been the same: to collect national data on consumer recognition, understanding, and purchasing influence of the ENERGY STAR label, as well as data on messaging and product purchases.

This report discusses the results of the CEE 2015 ENERGY STAR Household Survey, building on prior years' survey results and focusing on the extent to which consumers recognize the ENERGY STAR label, understand its intended messages, and utilize (or are influenced by) the label in their energy-related purchase decisions. Research questions of interest included the following:

- Where do consumers see or hear about the ENERGY STAR label?
- How does increased publicity affect recognition, understanding, and influence of the ENERGY STAR label?
- Which key messages about the ENERGY STAR label are consumers retaining?
- Do consumers demonstrate loyalty to the ENERGY STAR label?

The remainder of this report summarizes the survey and analysis methodology; it provides key findings regarding ENERGY STAR label recognition, understanding, influence, and information sources. It also contains appendices presenting detailed survey methodology (Appendix A), demographic information (Appendix B), additional questions from the 2015 survey (Appendix C), and a copy of the 2015 questionnaire (Appendix D). In all cases, the results presented in this report were weighted to obtain results applicable at the national level (please refer to Appendix A for details on the weighting methodology).

METHODOLOGY OVERVIEW

During October and November of 2015, CEE fielded a questionnaire to obtain information at the national level on consumer awareness of the ENERGY STAR label (please refer to Appendix A for a more detailed description of the survey methodology). A random sample of households that are members of an Internet panel was surveyed. Both the Internet panel as a whole and the sample of households completing the survey were selected by address-based sampling and recruited by telephone.¹ The panel is designed to be representative of the U.S. population.

This year's questionnaire was similar to the ones CEE fielded in 2000 – 2014. As in previous years, CEE and its sponsoring members made the survey data available to EPA for analysis.

The sampling frame for this national survey included all households in the largest 57 Nielsen Designated Market Areas® (DMAs) that together accounted for about 70 percent of U.S. television households. In addition, some CEE members periodically choose to sponsor more intensive sampling (i.e., an oversample) in selected localities, referred to here as *sponsor areas*. In 2015, no CEE members chose to sponsor an oversample.

As in previous years' studies, the Top-57 DMAs in the sampling frame were classified by publicity category. The original intent of the classification was to be able to assess the effect of local energy efficiency program publicity on awareness. The majority of these local efficiency programs historically have been supported by utility rate-payer funding.

The same publicity classification procedures have been used in each of the past 14 years, which was based on the following criteria:

- **High publicity:** Active local ENERGY STAR promotion *recently* sponsored by a utility, state agency, or other organization for two or more continuous years. The activities must include *sustained* promotions and publicity from non-federal sources.
- **Low publicity:** Federal campaign activities only and no *significant* regional program sponsor activities.
- **Other:** All other DMAs.

In 2009, a decision was made to use the 2008 publicity classification of the 57 largest DMAs in 2009 and all future years to preserve the historical classification for future study years.

¹ In previous years, the panel was recruited via random-digit dial. GfK, formerly Knowledge Networks, the firm that conducts the survey each year, believes that address-based sampling (ABS) offers advantages, including coverage of cell-phone-only households, and analysis of non-response bias. More information is available at <http://www.knowledgenetworks.com/accuracy/fall-winter2010/abs-fall2010.html>.

The key working definitions are below:

- **Recent:** The 2 years of activity must include the time period during which the survey was in the field.
- **Sustained:** The 2 years of activity must be continuous.
- **Significant:** In addition to any direct federal publicity efforts, a DMA's publicity efforts must include a deliberate and multifaceted regional program sponsor investment in ENERGY STAR programming, such as direct marketing efforts or the creation and distribution of promotional material.

Although the sample design was based on the 2015 publicity classifications, *low publicity* and *other publicity* are combined in the analysis and referenced as *non-high-publicity* areas. One reason to combine these categories in the analysis is that over time, the population of low-publicity DMAs has dropped to about 15 percent, while high-publicity DMAs now account for about half of U.S. television households.

The sample was stratified by area and within an area by publicity category. While the dataset has always been appropriately weighted in the national analysis, beginning in 2010, the number of respondents in each stratum was chosen in proportion to that stratum's share of the U.S. population living in DMAs. As in the past for the national sample, the three publicity categories (the top 57 DMAs) comprise 1,000 respondents.

This report presents the 2015 survey results at the national level and by publicity category. Results are presented on consumer recognition and understanding, and purchasing influence of the ENERGY STAR label, as well as on messaging, product purchases, and information sources that consumers use in their purchasing decisions.

In this report, the following terminology is used in comparing results across years or sub-categories. (1) The term "significant" implies statistical significance. In other words, differences between proportions that are described as "significant" are at least statistically different at the 10-percent level of significance. In some cases, the p-values are given to provide the exact level of statistical significance. (2) Unless stated otherwise, terms such as "smaller," "larger," "increase," or "decrease" refer to changes that are statistically significant at the 10-percent level or better. (3) The term "similar" implies that there is no statistical difference between the results being compared at the 10-percent level of significance. In other words, the difference between the results is within the bounds that would be expected from chance variation in a random sample.

KEY FINDINGS

RECOGNITION

In 2015, 88 percent of households recognized the ENERGY STAR label when shown the label (i.e., *aided recognition*). Eighty-three percent of households recalled having seen or heard of the ENERGY STAR label without first being shown the label (i.e., *unaided recognition*).

For purposes of this analysis, respondents were said to recognize the ENERGY STAR label if they had seen or heard of the label before the survey. Recognition of the label was explored in two ways. Unaided recognition was measured by asking if the respondent had seen or heard of the ENERGY STAR label without showing the label. Delivery of the survey by Internet made it possible to measure aided recognition. Aided recognition was measured by showing respondents the ENERGY STAR label and then asking if they had seen or heard of the label. Both methods are useful measurements of label recognition, although unaided recognition is the more conservative of the two.

Recognition results for both the 2015 and 2014 surveys are summarized in the following table. Aided and unaided recognition of the ENERGY STAR label results were similar in 2014 and 2015 (p-values 0.5508 and 0.3618, respectively).

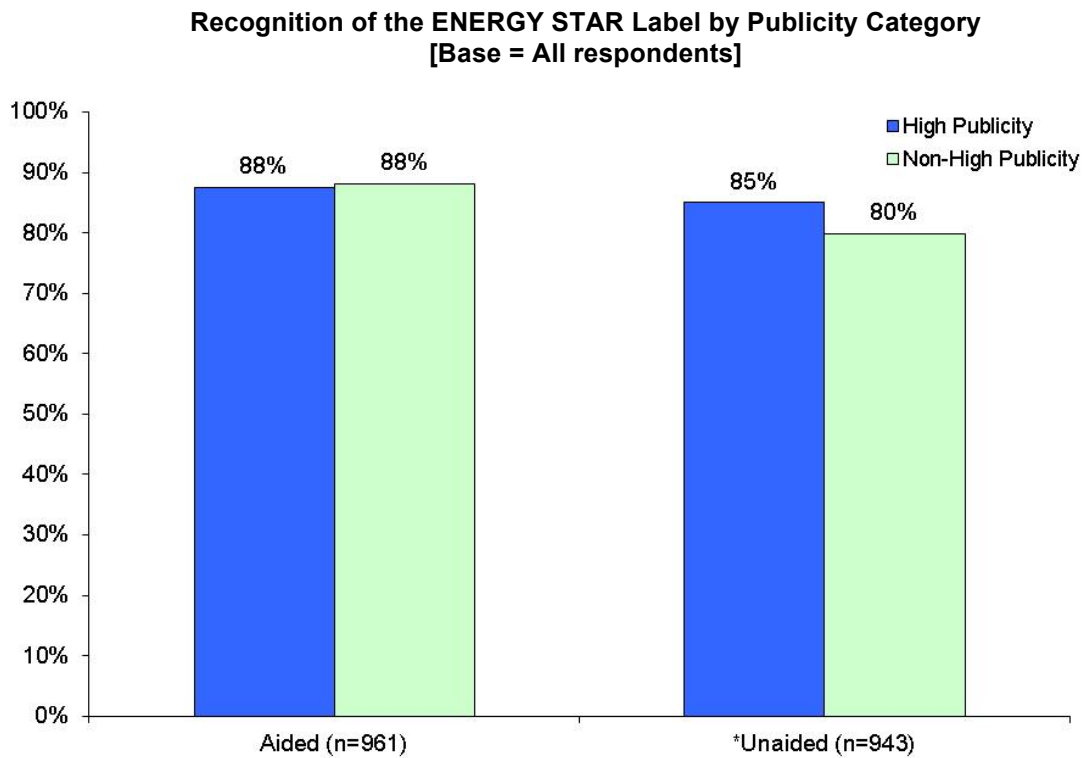
Recognition of the ENERGY STAR Label
[Base = All respondents]

| Recognize ENERGY STAR Label | 2015 | | 2014 | |
|-----------------------------------|------------------|--------------------|--------------------|----------------------|
| | Aided (n=961) | Unaided (n=943) | Aided (n=1,358) | Unaided (n=1,318) |
| Yes | 88% | 83% | 89% | 81% |

Note: The unaided recognition results for both years were based on the question ES1: "Have you ever seen or heard of the ENERGY STAR label?" The aided recognition results were based on five questions. (1) ES3A and (2) ES3B were asked if ES1 = "yes." ES3A: "Is this the label you have seen or heard of before?"—whether the old or new label was shown was randomly determined. ES3B: "Have you seen or heard of this version of the ENERGY STAR label?"—where the label shown was the one not shown previously. (3) ES3C and (4) ES3D were asked if ES1 = "no." ES3C: "Please look at the ENERGY STAR label on the left. Have you ever seen or heard of this label?"—whether the old or new label was shown was randomly determined. ES3D: "Have you seen or heard of this version of the ENERGY STAR label?"—where the label shown was the one not shown previously. (5) ES6 was asked if either ES1 = "no" or both ES3A and ES3B = "no." ES6: "Now that you have had the opportunity to see the ENERGY STAR label, do you recall seeing or hearing anything about it before this survey?"—where both the old and new labels were shown.

Recognition by Publicity Category

After being shown the ENERGY STAR label (aided), the same percent of households in high and non-high-publicity areas recognized the label, 88 percent for both publicity areas (p-value = 0.8073). Unaided recognition was 85 percent in high-publicity areas and 80 percent in non-high-publicity areas; this difference is statistically significant at the 10-percent level (p-value = 0.0858).



*High and non-high-publicity area proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

Product Associations

Households that recognized the ENERGY STAR label (aided) indicate strong association between the label and products historically supported by regional energy efficiency programs (refrigerators, washing machines, dishwashers, compact fluorescent light bulbs, etc.).

Survey respondents that recognized the ENERGY STAR label (aided) were asked, “What types of products, goods, and services do you think of when you think of the ENERGY STAR label?” (survey question QA). The figure on the next page presents the results for this question, which indicate *unprompted* product associations.

Since at least 2010, appliances, refrigerators, and washing machines have shown the strongest unprompted associations with the label at 49, 36, and 32 percent, respectively. Clothes dryers became eligible to receive the ENERGY STAR certification in 2015, and showed the fourth strongest association with the label at 28 percent.² Respondents had previously associated clothes dryers with the ENERGY STAR label before they were eligible for certification, however. The next strongest associated products (unprompted) were air conditioners, dishwashers, and stoves/ovens at 16, 14, and 13 percent, respectively. Stoves/ovens are not eligible for ENERGY STAR certification but are still included in the list of products mentioned by households. Of the top six product associations, none are significantly different from the 2014 results. In addition to stoves/ovens, microwave ovens do not have an ENERGY STAR specification³. Computers or monitors, computer printers, and VCRs/DVDs all showed increases in label association from 2014. However, these products were mentioned by relatively few respondents (7, 1, and 1 percent, respectively). Relatively more households associate the ENERGY STAR label with some “other” type of product in 2015 than in 2014 (p-value = 0.0023) ; and less than in 2014 for “no product;” these differences are statistically different at the 1-percent level (p-value = 0.0007).

When prompted, 87 percent of households had seen the label on refrigerators. Washing machines (74 percent) and dishwashers (74 percent) were the next products most commonly associated with the ENERGY STAR label. Association with these top three products (prompted) is consistent with 2014 results, 86, 75, and 75, respectively. Water heaters, microwave ovens, central A/C, television, room air conditioners, and windows followed next in a range of 47 to 60 percent.

² The clothes dryer specification went into effect in January 2015.

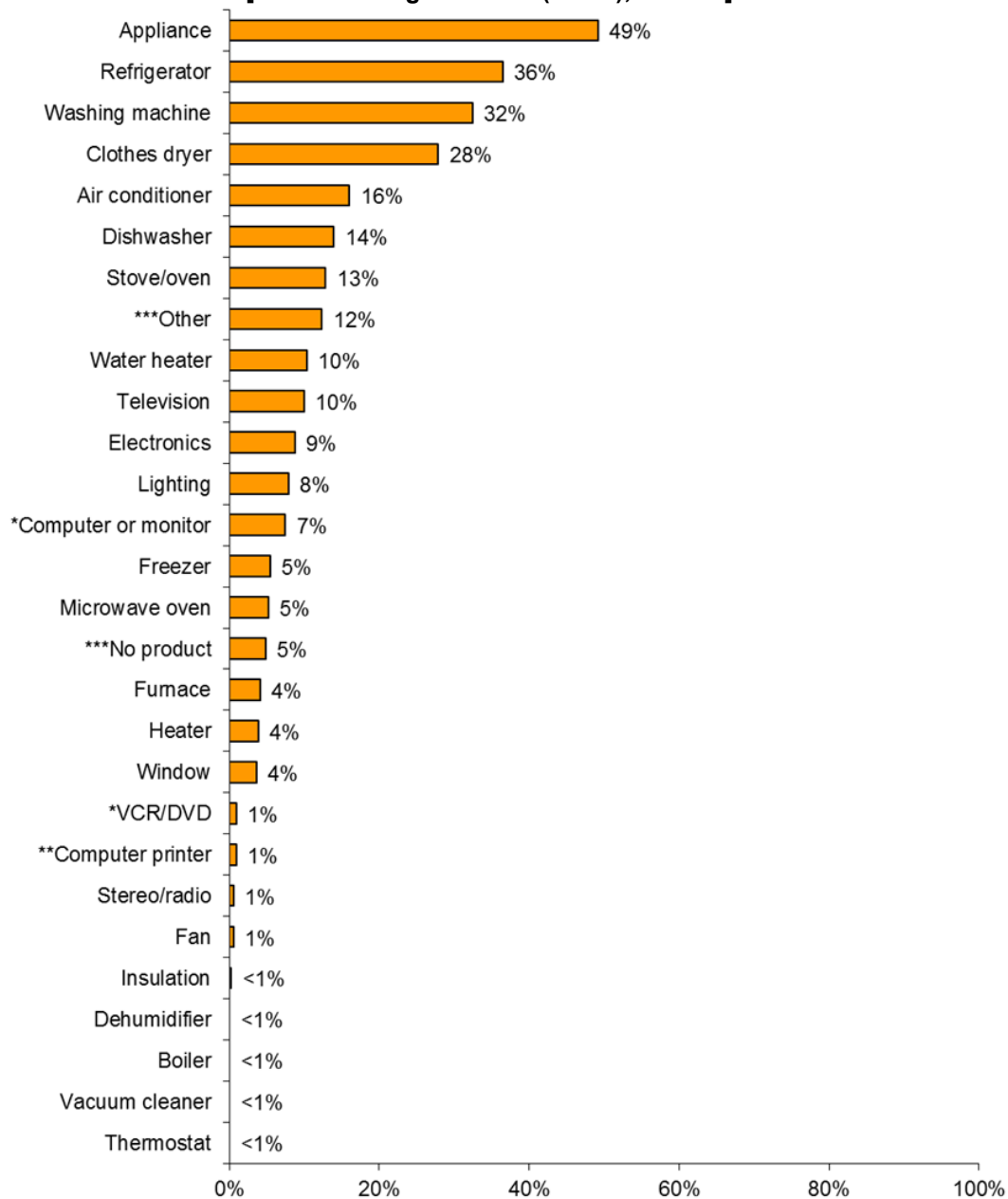
³ Microwave ovens are not currently eligible for ENERGY STAR certification.

In 2015, there was an increase in label awareness from 2014 for eight products. These products include:

- At the 1-percent level of significance: heat pumps (20 percent and 15 percent, respectively) and skylights (15 percent and 10 percent, respectively).
- At the 5-percent level of significance: windows (47 percent and 40 percent, respectively).
- At the 10-percent level of significance: microwave ovens (52 percent and 46 percent, respectively), room air conditioners (48 percent and 43 percent, respectively), furnace/boilers (37 percent and 31 percent, respectively), light bulbs (36 percent and 31 percent, respectively), and doors (25 percent and 21 percent, respectively).

None of the twenty-eight products had lower levels of association in 2015 than in 2014.

Unprompted Product Association with the ENERGY STAR Label
[Base = Recognize label (aided), n = 779]



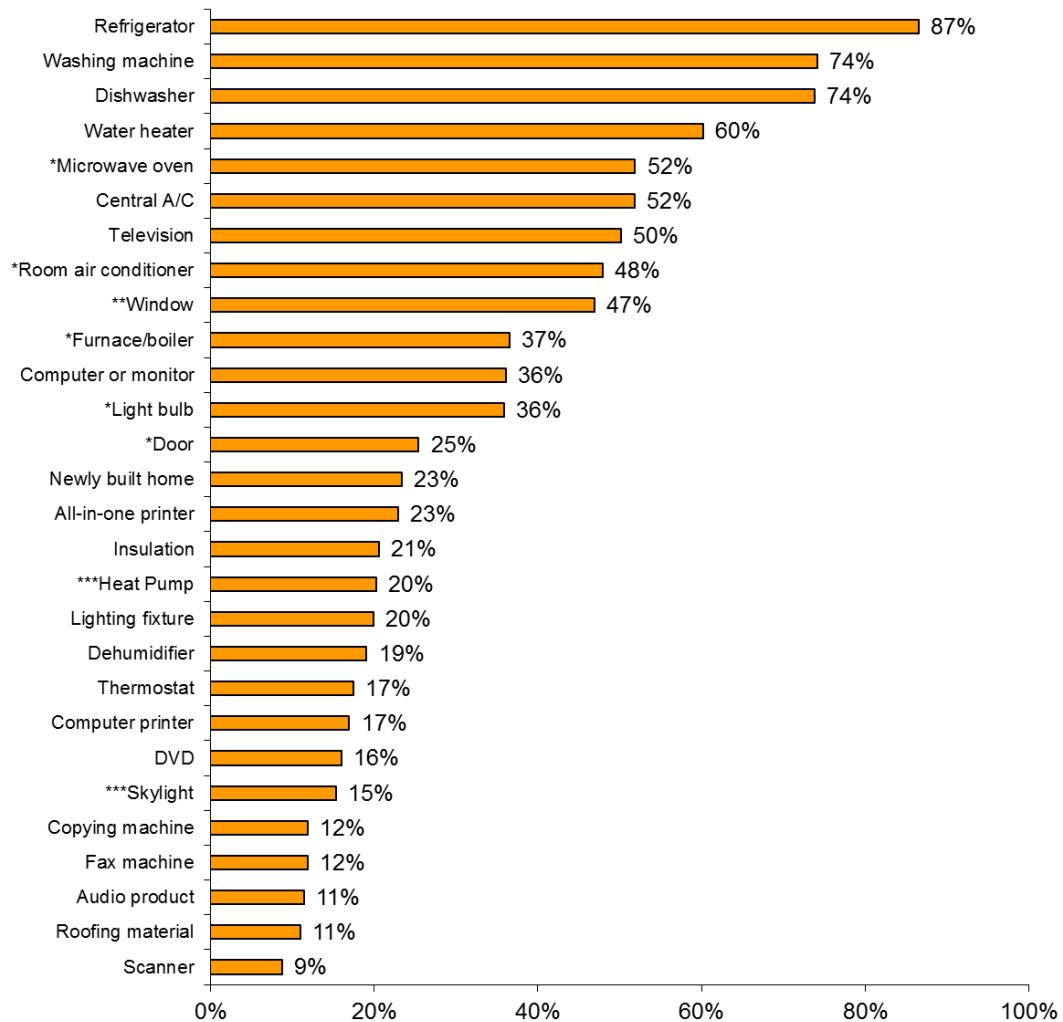
Note: QA: "What types of products, goods, or services do you think of when you think of the ENERGY STAR label? Please write your answers below."

*** 2015 and 2014 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01). The proportion of households in 2015 is larger than 2014 for "other," and is smaller than 2014 for "no product."

** 2015 and 2014 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05). The proportion of households in 2015 is larger than 2014 for computer printers.

* 2015 and 2014 proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10). The proportion of households in 2015 is larger than 2014 for computers or monitors, and for VCRs/DVDs.

Prompted Product Association with the ENERGY STAR Label
[Base = Recognize label (aided)⁴]



Note: Q5 (a, b, and c): "Now we're going to ask you about several groups of products. As you review the list, please select each of the products, product literature, or packaging on which you have seen the ENERGY STAR label."

*** 2015 and 2014 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01). The proportion of households in 2015 is larger than 2014 for heat pumps and skylights.

** 2015 and 2014 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05). The proportion of households in 2015 is larger than 2014 for windows.

* 2015 and 2014 proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10). The proportion of households in 2015 is larger than 2014 for microwave ovens, room air conditioners, furnaces/boilers, light bulbs, and doors.

⁴ Respondents were asked about three sets of product groupings: (1)(a) Heating and Cooling Products and Home Office Equipment, (2)(b) Home Appliances/Lighting and Home Electronics, and (3)(c) Building Materials and Buildings. The sample sizes, n, for these sets of product groupings are 795, 796, and 775 respectively.

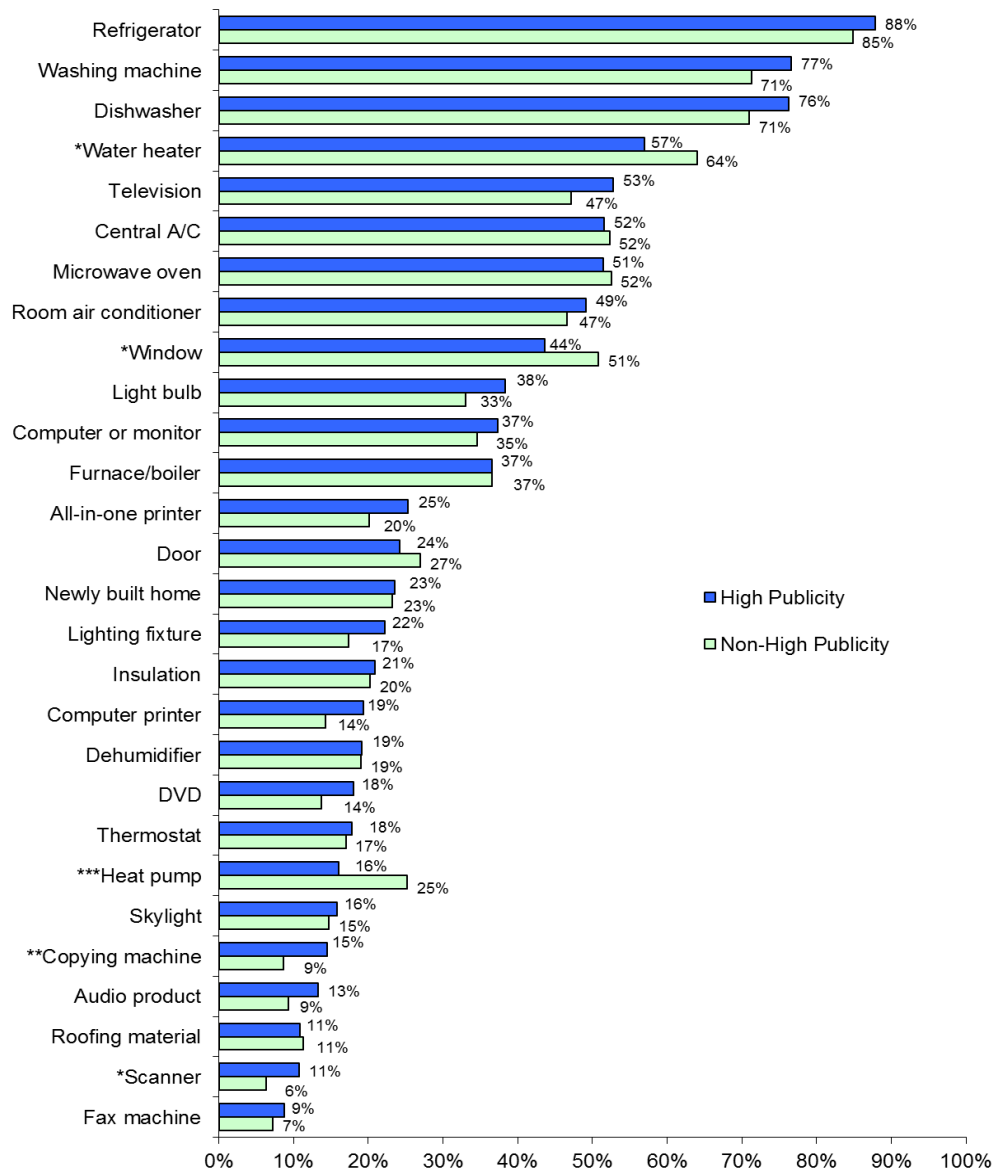
Product Associations by Publicity Category

Regional energy efficiency program sponsors have traditionally focused on promoting ENERGY STAR certified lighting, refrigerators, room air conditioners, washing machines, dishwashers, programmable thermostats⁵, and new homes. More recently, program sponsors have begun to promote ENERGY STAR certified water heaters and TVs in some parts of the country. Key findings from this year's analysis of product association by publicity category include the following.

- A significantly larger proportion of households in high-publicity areas than non-high publicity areas associated copying machines (15 percent and 9 percent, respectively), (p-value = 0.0299) and scanners (11 percent and 6 percent, respectively), (p-value = 0.0723) with the ENERGY STAR label when prompted.
- A significantly smaller proportion of households in high-publicity areas than non-high-publicity areas associated water heaters (57 percent and 64 percent, respectively), (p-value = 0.0920), windows (44 percent and 51 percent, respectively), (p-value = 0.0932), and heat pumps (16 percent and 25 percent, respectively), (p-value = 0.0076) with the ENERGY STAR-label when prompted.

⁵ EPA suspended the use of the ENERGY STAR label for programmable thermostats December 31, 2009. While EPA recognizes the potential for programmable thermostats to save significant amounts of energy, there continue to be questions regarding the net savings and environmental benefits achieved due to variations in consumer understanding and usage of programmable thermostats. EPA is working to develop a related Residential Climate Control specification. For more information visit: www.energystar.gov/productdevelopment.

Prompted Product Association with the ENERGY STAR Label by Publicity Category
[Base = Recognize label (aided)]^{6,7}



*** High- and non-high-publicity area proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01).

** High- and non-high-publicity area proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

* High- and non-high-publicity area proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

⁶ As discussed in footnote 3, respondents were asked about three sets of product groupings. In Heating and Cooling Products and Home Office Equipment, the sample sizes for high- and non-high-publicity areas are 422 and 373, respectively. For Home Appliances/Lighting and Home Electronics they are 422 and 374, and for Building Materials and Buildings they are 413 and 362.

⁷ The percent labels on the bars are rounded to the nearest whole number. Therefore bars with the same label may not be the same length.

UNDERSTANDING

In 2015, 85 percent of households had at least a general understanding of the ENERGY STAR label. Furthermore, the proportion of households that exhibited only a general understanding (9 percent) was small compared with the proportion that exhibited a high understanding (76 percent). The level of understanding was investigated by asking respondents what messages came to mind when they saw the ENERGY STAR label. Based on the reported messages, a respondent's understanding was classified as *high*, *general*, or *no understanding*.

The 2015 and 2014 survey results on the level of understanding of the ENERGY STAR label are provided in the following table. The proportion of respondents with a high understanding of the label remained consistent from 2014 to 2015, 75 percent and 76 percent, respectively (p-value = 0.9646). In addition, the proportion of respondents with at least a general understanding of the label is also consistent from 2014 to 2015, 84 percent and 85 percent, respectively (p-value = 0.8206).

Understanding of the ENERGY STAR Label
[Base = All respondents]

| Level of Understanding of the Label | 2015 (n=1,000) | 2014 (n=1,400) |
|--|---------------------------|---------------------------|
| High understanding | 76% | 75% |
| | | |
| No understanding | 15% | 16% |
| Total | 100% | 100% |

Note: The level of understanding of the ENERGY STAR label is determined using the open-ended responses to two questions (1) ES2: "What does the ENERGY STAR label mean to you?", and (2) ES4A1: "Please look at the ENERGY STAR labels on the left. Type the messages that come to mind when you see the ENERGY STAR label."

In all years except 2006, all respondents were asked either ES2 or ES4A1, depending on their answers to ES1. Respondents that answered "Yes" to ES1 were then asked ES2, while all other respondents were asked ES4A1.

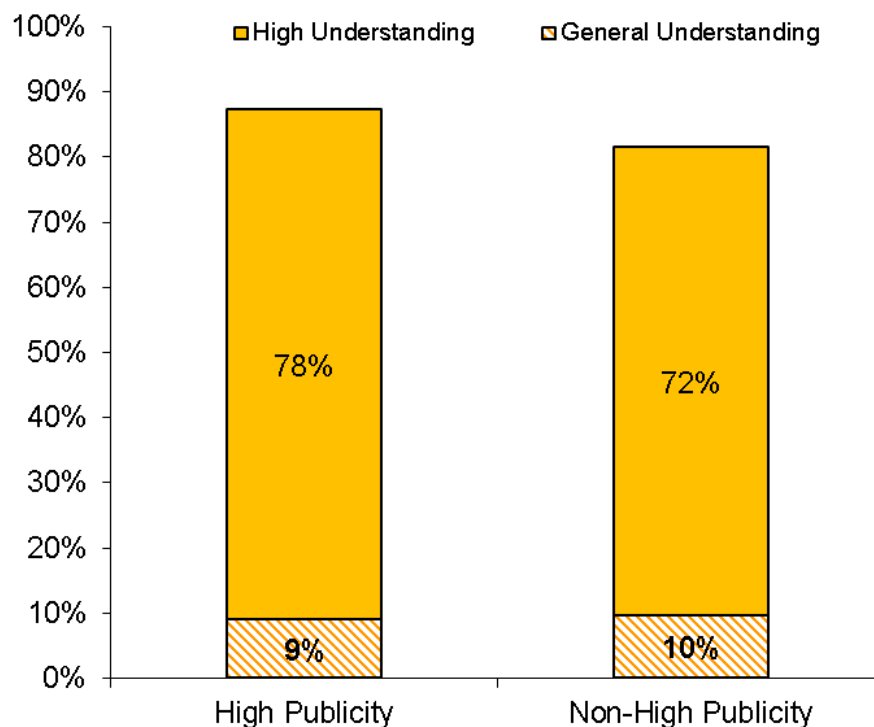
Understanding by Publicity Category

Eighty-seven percent of households in high-publicity areas had at least a general understanding of the label compared with 82 percent of households in non-high-publicity areas. This difference between high and non-high-publicity categories is statistically significant at the 5-percent level (p-value = 0.0430). More households exhibited a high degree of understanding in high-publicity areas (78 percent) than non-high-publicity areas (72 percent); this difference is significant at the 10-percent level (p-value = 0.0509).

Understanding of the ENERGY STAR Label by Publicity Category
[Base = All respondents]

| Publicity Category | At Least General Understanding of Label |
|----------------------------------|---|
| High | 87% |
| Non-high | 82% |
| Difference (High minus Non-high) | 6% |
| p-value | 0.043 |

Understanding of the ENERGY STAR Label by Publicity Category
[Base = All respondents]



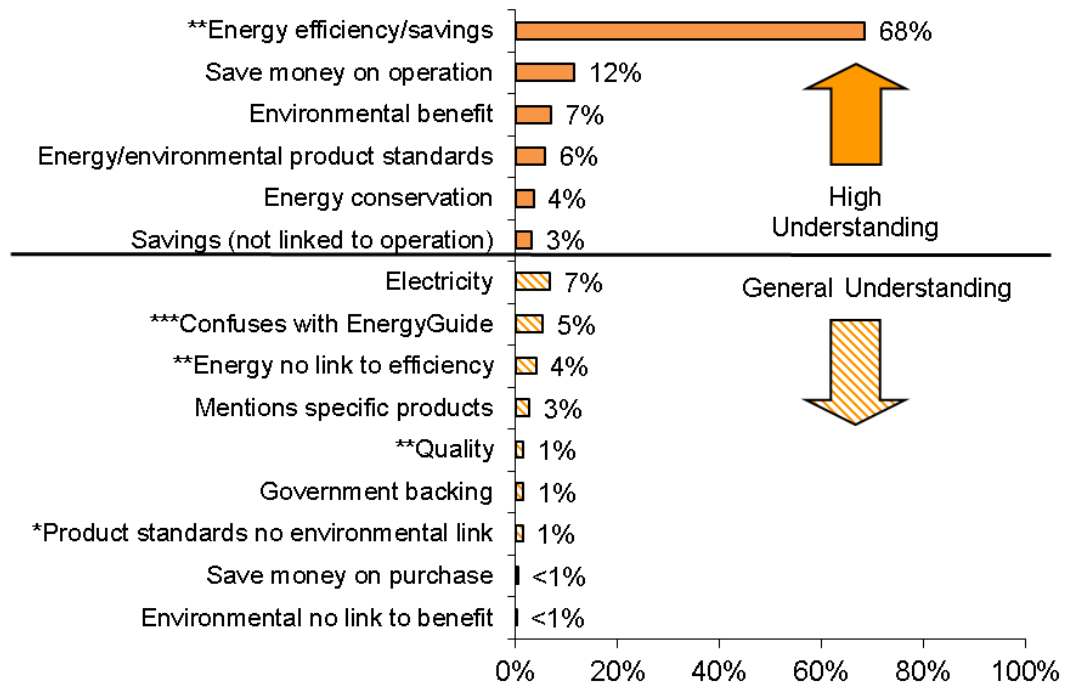
Understanding of Label Messaging

Open-ended responses to the questions on the level of understanding of the ENERGY STAR label are an indicator of how effectively EPA communicates its messages through the label. These responses are used in the analysis of understanding in the previous section. By far, the most common message associated with the label was “energy efficiency or energy savings,” which is considered high understanding of the label. Sixty-eight percent of households surveyed associated the ENERGY STAR label with this message. This was an increase from 63 percent in 2014; this difference is statistically significant at the 5-percent level ($p\text{-value} = 0.0295$).

Between 2014 and 2015, there was an increase in the percent of households that associated the ENERGY STAR label with messages considered a general understanding of the ENERGY STAR label. These consisted of “quality”, “confuses with EnergyGuide”, and “product standards no environmental link.” “Quality” is statistically different from 2014 at the 5-percent level ($p\text{-value} = 0.0263$) and “confuses with EnergyGuide” is statistically different at the 1-percent level ($p\text{-value} = 0.0013$). “Product standards no environmental link” is statistically higher at the 10-percent level ($p\text{-value} = 0.07182$).

Lastly, there was a statistically significant decrease in households associating the label with “energy no link to efficiency” from 7 percent in 2014 to 4 percent in 2015 at the 5-percent significance level ($p\text{-value} = 0.0124$). This message is also considered a general understanding of the ENERGY STAR label. These results can be viewed in the following chart.

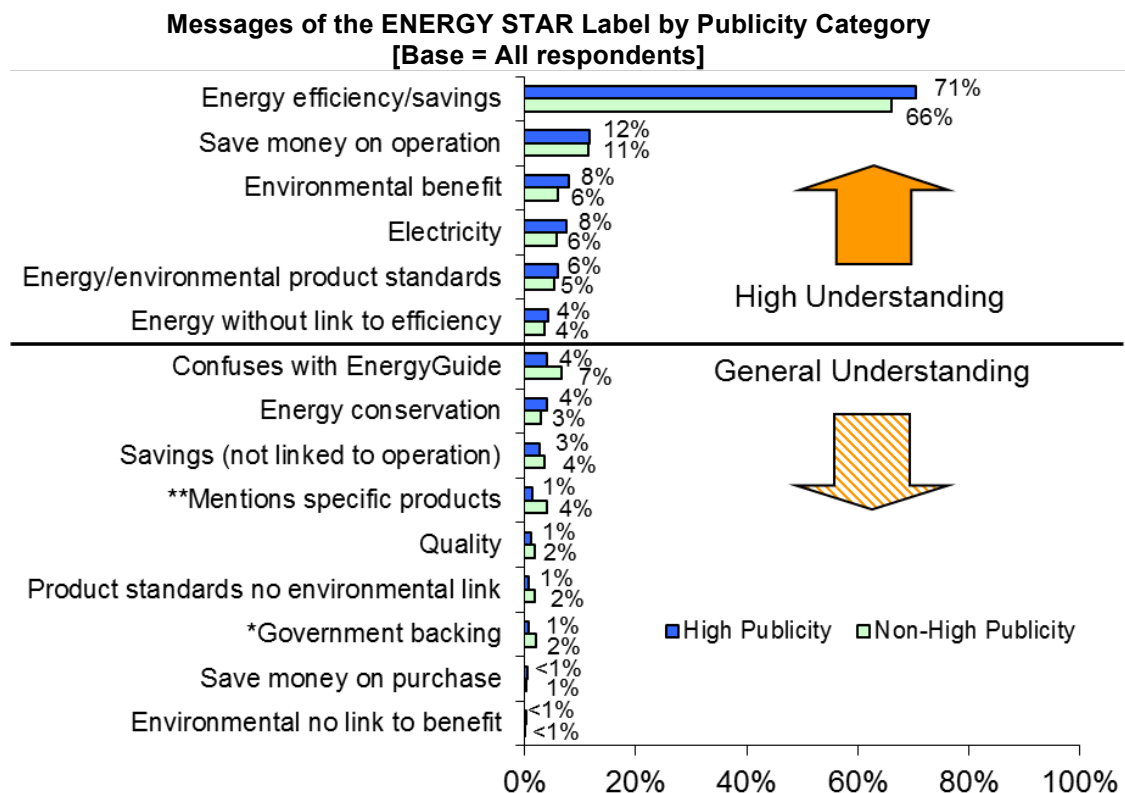
Messages of the ENERGY STAR Label
[Base = All respondents]



- *** 2015 and 2014 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01). The proportion of households in 2015 is larger than 2014 for "Confuses with EnergyGuide."
- ** 2015 and 2014 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05). The proportion of households in 2015 is larger than 2014 for "Energy efficiency/savings" and "Quality". The proportion of households in 2015 is smaller than 2014 for "Energy no link to efficiency".
- * 2015 and 2014 proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10). The proportion of households in 2015 is larger than 2014 for "Product standards no environmental link".

Understanding of Label Messaging by Publicity Category

A majority of respondents in high-publicity regions (71 percent) and non-high-publicity regions (66 percent) associated the ENERGY STAR label with “energy efficiency or energy savings.” For this and all other messages considered to show a high understanding, the proportion of households that associated the message with the ENERGY STAR label was similar for high- and non-high-publicity regions. For messages considered to show a general understanding, more respondents in non-high-publicity regions (4 percent) than high-publicity regions (1 percent), “mentioned specific products;” this difference is statistically significant at the 5-percent level (p-value = 0.0392). More households in non-high-publicity areas than high-publicity areas associate the label with “government backing,” 2 percent and 1 percent, respectively. This difference is statistically significant at the 10-percent level (p-value = 0.0764).



** High- and non-high-publicity area proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

* High- and non-high-publicity area proportions are statistically different from each other at the 10-percent level of significance (≤ 0.10).

Understanding of the ENERGY STAR Label by Aided Recognition

Households that recognized the ENERGY STAR label when shown the label were more likely to have at least a general understanding of the label than those that did not recognize the label. In 2015, 91 percent of households that recognized the ENERGY STAR label had at least a general understanding of it, whereas of the households that did not recognize the label, 53 percent had at least a general understanding of it. This 38 percentage point difference in understanding between households that recognized the label and those that did not is statistically significant at the 1-percent level. The proportion of households that had at least a general understanding of the label in 2015 is statistically different from the 2014 result (88 percent) at the 5-percent level (p-value = 0.0493).

Among households that did not recognize the label when shown it, the proportion that had at least a general understanding of the label in 2015 (53 percent) is similar to the 2014 result (62 percent), (p-value = 0.2173).

Understanding of the ENERGY STAR Label by Aided Recognition
[Base = All respondents]

| Recognize ENERGY STAR Label Aided | At Least General Understanding of Label | |
|-----------------------------------|---|---------|
| | 2015 | 2014 |
| Yes | 91% | 88% |
| No | 53% | 62% |
| Difference (Yes minus No) | 38% | 26% |
| p-value | <0.0001 | <0.0001 |

INFLUENCE

The survey provided some insight into consumers' decisions to purchase ENERGY STAR-labeled products, including the following:

- The proportion of households nationwide that recognized the ENERGY STAR label and knowingly purchased an ENERGY STAR-labeled product.
- The influence of the ENERGY STAR label on purchase decisions.
- The role of rebates or financing in decisions to buy ENERGY STAR-labeled products.
- The loyalty of purchasers to ENERGY STAR-labeled products.

Purchases of ENERGY STAR-labeled Products

In order to estimate the percent of *all* households that knowingly purchased an ENERGY STAR product, the following three proportions were multiplied:

- The proportion of all households that recognized the ENERGY STAR label (aided).
- Of the households that recognized the label (aided), the proportion that purchased a product in a product category that has an ENERGY STAR specification.
- Of the households that recognized the label (aided) and purchased a product in a relevant category, the proportion that knowingly purchased an ENERGY STAR-labeled product.

For each of the three proportions, the results for 2015 and 2014 are similar. In 2015, of the households that recognized the label (aided) and purchased a product in a relevant product category, 77 percent purchased an ENERGY STAR-labeled product. This proportion remained at 75 percent since 2012. All other proportions have fluctuated each year.

**National Household Market Penetration of
ENERGY STAR Products by Year**

| | Aided Recognition (2014 n=1,358) (2015 n=961) | Purchased Product (2014 n=1,206) (2015 n=845) | Knowingly Purchased ENERGY STAR product (2014 n=596) (2015 n=432) |
|-------------------|--|--|--|
| 2015 | 88% | 68% | 77% |
| 2014 | 89% | 69% | 75% |
| Difference | -1.0% | -0.5% | 2.5% |
| p-value | 0.551 | 0.842 | 0.421 |

Overall, 46 percent of all households knowingly purchased an ENERGY STAR product in the past 12 months. This is similar to the 2014 result (45 percent).

**Knowingly Purchased ENERGY STAR Product By Year
(Base = All respondents)**

| Purchased ENERGY STAR product | 2015 (n=961) | 2014 (n=1,358) |
|--|-------------------------|---------------------------|
| Estimate (yes) | 46% | 45% |
| Standard Error | 2.5% | 2.2% |

Purchases of ENERGY STAR by Publicity Category

The proportion of *all* households that knowingly purchased an ENERGY STAR product in high- versus non-high-publicity areas is 48 and 44 percent, respectively. This difference is not statistically significant (p-value = 0.3353). The same proportion of *all* households in high-publicity areas (48 percent) also knowingly purchased an ENERGY STAR product in 2014. The proportions of respondents who knowingly purchased ENERGY STAR products in non-high-publicity areas was also similar between 2015 (44 percent) and 2014 (42 percent), p-value = 0.7686.

**Knowingly Purchased ENERGY STAR
Product by Publicity Category and Year**
[Base = All respondents]

| Publicity Category | % Households | |
|---|--------------|--------|
| | 2015 | 2014 |
| High | 48% | 48% |
| Non-High | 44% | 42% |
| Difference (High minus Non-High) | 5% | 6% |
| p-value | 0.3353 | 0.1603 |

As noted above, three proportions are used to calculate the proportion of *all* households that knowingly purchased an ENERGY STAR product: aided recognition of the program label, purchase of a product in a relevant product category, and the proportion of those purchasers that knowingly bought ENERGY STAR products. In 2015, high- and non-high-publicity proportions are similar.

**National Household Market Penetration of
ENERGY STAR Products by Publicity Category**

| | Aided Recognition (n=961) | Purchased Product (n=845) | Knowingly Purchased ENERGY STAR product (n=432) |
|---------------------------|---------------------------------|---------------------------------|---|
| High Publicity | 88% | 70% | 79% |
| Non-High Publicity | 88% | 66% | 75% |
| Difference | -0.6% | 3.5% | 4.6% |
| p-value | 0.807 | 0.374 | 0.308 |

Influence of the ENERGY STAR Label

In 2015, over three quarters (77 percent) of the households that recognized the ENERGY STAR label (aided), and knowingly purchased an ENERGY STAR-labeled product reported having been influenced “very much” or “somewhat” by the label. This proportion of households was also 77 percent in 2014.

More households in 2015 reported being “very much” influenced by the label after recognizing it and purchasing an ENERGY STAR-labeled product, than this household group in 2014 (52 and 43 percent, respectively). This difference is statistically significant at the 10-percent level (p-value = 0.0514). In contrast, significantly fewer households in 2015 that recognized the label, and knowingly purchased an ENERGY STAR-labeled product were “somewhat” influenced by the label, compared to 2014 (25 percent and 34 percent respectively). This decrease is statistically significant at the 5-percent level (p-value = 0.0247).

Influence of the ENERGY STAR Label on Purchase Decisions⁸
[Base = Recognize label (aided) and ENERGY STAR purchasers]

| Influence of the Label on Purchasing Decisions | 2015 (n=303) Maximum | 2014 (n=415) Maximum |
|---|-------------------------------------|-------------------------------------|
| Very much* | 52% | 43% |
| Somewhat** | 25% | 34% |
| Slightly | 11% | 11% |
| Not at all | 12% | 12% |
| Total | 100% | 100% |

Note: Q8: “For each ENERGY STAR-labeled product you purchased, how much did the ENERGY STAR label influence your purchase decision?”

⁸ Respondents that recognize the label (aided) and purchased an ENERGY STAR-labeled product are asked Q8 (“For each ENERGY STAR-labeled product you purchased, how much did the ENERGY STAR label influence your purchase decision?”) for each ENERGY STAR-labeled product they purchased. The results presented in this table use the highest influence rating provided by respondents that purchased more than one ENERGY STAR-labeled product.

Influence of the ENERGY STAR Label by Publicity Category

The purchase decisions of 51 percent of households in high-publicity areas were influenced "very much" by the ENERGY STAR label, compared to 52 percent in non-high-publicity areas; this difference is not significant at the 10-percent level. When these proportions are added to the proportions of households for which the ENERGY STAR label was "somewhat" influential in their purchasing decisions, the high- to non-high-publicity area comparison is 74 to 80 percent, respectively, which is not statistically different at the 10-percent level of significance. The combined "very much, somewhat, or slightly" proportion is 85 percent in high-publicity areas, and 90 percent in non-high-publicity areas. None of these differences are statistically significant across publicity categories, nor are they statistically significant compared to 2014.

Influence of the ENERGY STAR Label on Purchase Decisions by Publicity Category
[Base = Recognize label (aided) and ENERGY STAR purchasers, n = 303]

| Publicity Category | Very much | Very much or somewhat | Very much, somewhat, or slightly |
|---|------------------|--------------------------------------|---|
| High | 51% | 74% | 85% |
| Non-High | 52% | 80% | 90% |
| Difference (High minus Non-High) | -1% | -6% | -5% |
| p-value | 0.942 | 0.262 | 0.242 |

Rebate and Financing Influence

From 2014 to 2015, the percentage of households that knowingly purchased an ENERGY STAR-labeled product and received rebates or reduced-rate financing was at 13 percent, similar to last year (p-value = 0.2028). Of these households in 2015, 65 percent would have been “very likely” to purchase the ENERGY STAR product if financial incentives had not been available. This is also similar to 2014 at 60 percent (p-value = 0.6514). No respondent in the 2015 sample claimed they were “not likely at all” to purchase an ENERGY STAR product without a financial incentive.

Received Financial Incentive for an ENERGY STAR Product Purchased [Base = Recognize label (aided) and ENERGY STAR purchaser]

| Received Financial Incentive for an ENERGY STAR Product Purchased | % Households | |
|---|-----------------|-----------------|
| | 2015 (n=282) | 2014 (n=382) |
| Yes | 13% | 17% |
| No | 87% | 83% |
| Total | 100% | 100% |

Note: Q9: “Did you receive rebates or reduced-rate financing for any ENERGY STAR-labeled product(s) you purchased?”

Influence of Rebates and Financing on Purchasing Decisions [Base = Recognize label (aided), ENERGY STAR purchaser, and received an incentive]

| Likelihood Purchase ENERGY STAR Product Without Financial Incentive | % Households | |
|---|----------------|----------------|
| | 2015 (n=38) | 2014 (n=57) |
| Very likely | 65% | 60% |
| Somewhat likely | 23% | 29% |
| Slightly likely | 12% | 8% |
| Not at all likely | 0% | 3% |
| Total | 100% | 100% |

Note: Q10: “If rebates or reduced-rate financing had not been available, how likely is it that you would have purchased the ENERGY STAR-labeled product?”

Loyalty to ENERGY STAR

Loyalty to ENERGY STAR is investigated by asking respondents who knowingly purchased an ENERGY STAR-labeled product how likely they would be to recommend ENERGY STAR products to a friend. Respondents were asked to report this likelihood on a scale of 0 to 10, where 0 means “extremely unlikely” and 10 means “extremely likely.” As seen in the table below, 33 percent of households who knowingly purchased an ENERGY STAR-labeled product reported they would be “extremely likely” to recommend ENERGY STAR products to a friend. This proportion is similar to the 2014 value (p-value = 0.7919).

The likelihood of recommending ENERGY STAR products to a friend is greater than “6” for 78 percent of these households. This is similar to the previous year’s result of 75 percent (p-value = 0.3929).

Loyalty to ENERGY STAR
[Base = Recognize label (aided) and purchasers]

| Likelihood Recommend ENERGY STAR Products | % Households | |
|---|-----------------|-----------------|
| | 2015 (n=255) | 2014 (n=275) |
| 10 - Extremely likely | 33% | 32% |
| 9 | 13% | 14% |
| 8 | 22% | 18% |
| 7 | 10% | 11% |
| 6 | 7% | 8% |
| 5 | 6% | 10% |
| 4 | 5% | 1% |
| 3 | 2% | 2% |
| 2 | 1% | 2% |
| 1 | 1% | 1% |
| 0 - Extremely unlikely | 0% | 1% |
| Total | 100% | 100% |

Notes: Q11: “How likely are you to recommend ENERGY STAR-labeled products to a friend?” is measured on an 11-point scale, where 0 = “Extremely unlikely” and 10 = “Extremely likely.”

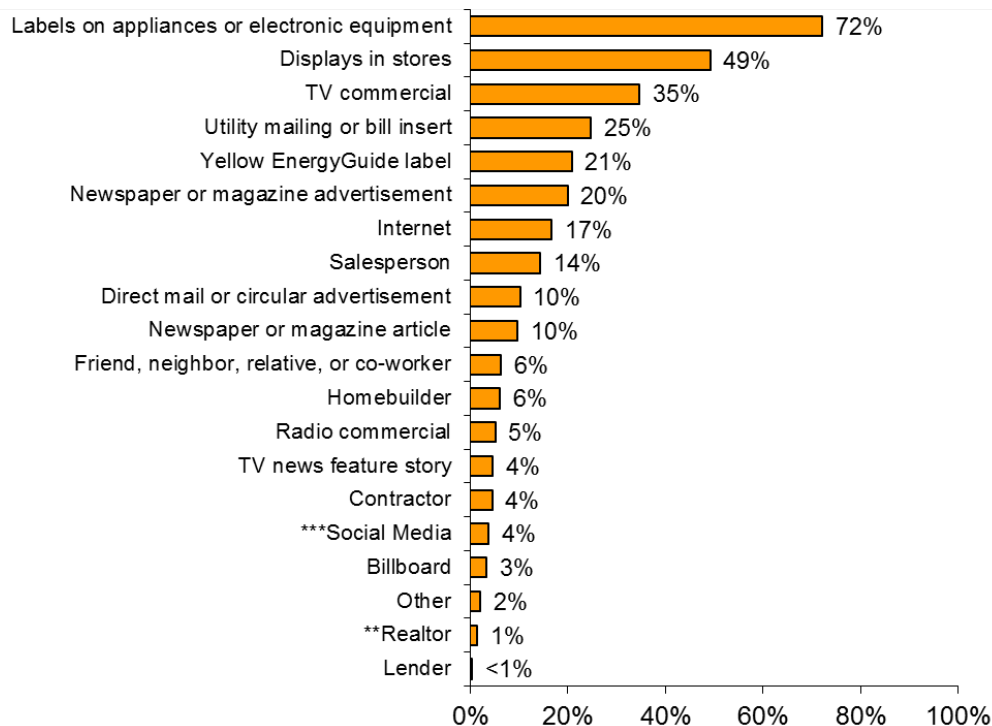
INFORMATION SOURCES

Sources Seen

Seventy-two percent of households have seen something about ENERGY STAR on appliance or electronics labels, and 49 percent of households have seen something about ENERGY STAR in store displays. Thirty-five percent of households heard or saw something about ENERGY STAR on TV commercials. Between 17 and 25 percent of households saw something about ENERGY STAR in utility mailings or bill inserts, on EnergyGuide labels, in newspaper or magazine advertisements, or on the internet.

The proportion informed by social media increased to 4 percent in 2015 from 1 percent in 2014, and is statistically significant at the 1-percent level (p -value = 0.0078). Fewer households heard about the label from realtors in 2015 (1 percent), compared to 2014 (4 percent). This difference is significant at the 5-percent level (p -value = 0.0122). All other responses were similar to the proportions from the 2014 survey.

Sources Saw or Heard Something About ENERGY STAR
[Base = Recognize label (aided), n = 757]



Note: SO1: "Where did you see or hear something about ENERGY STAR? Please mark all that apply."

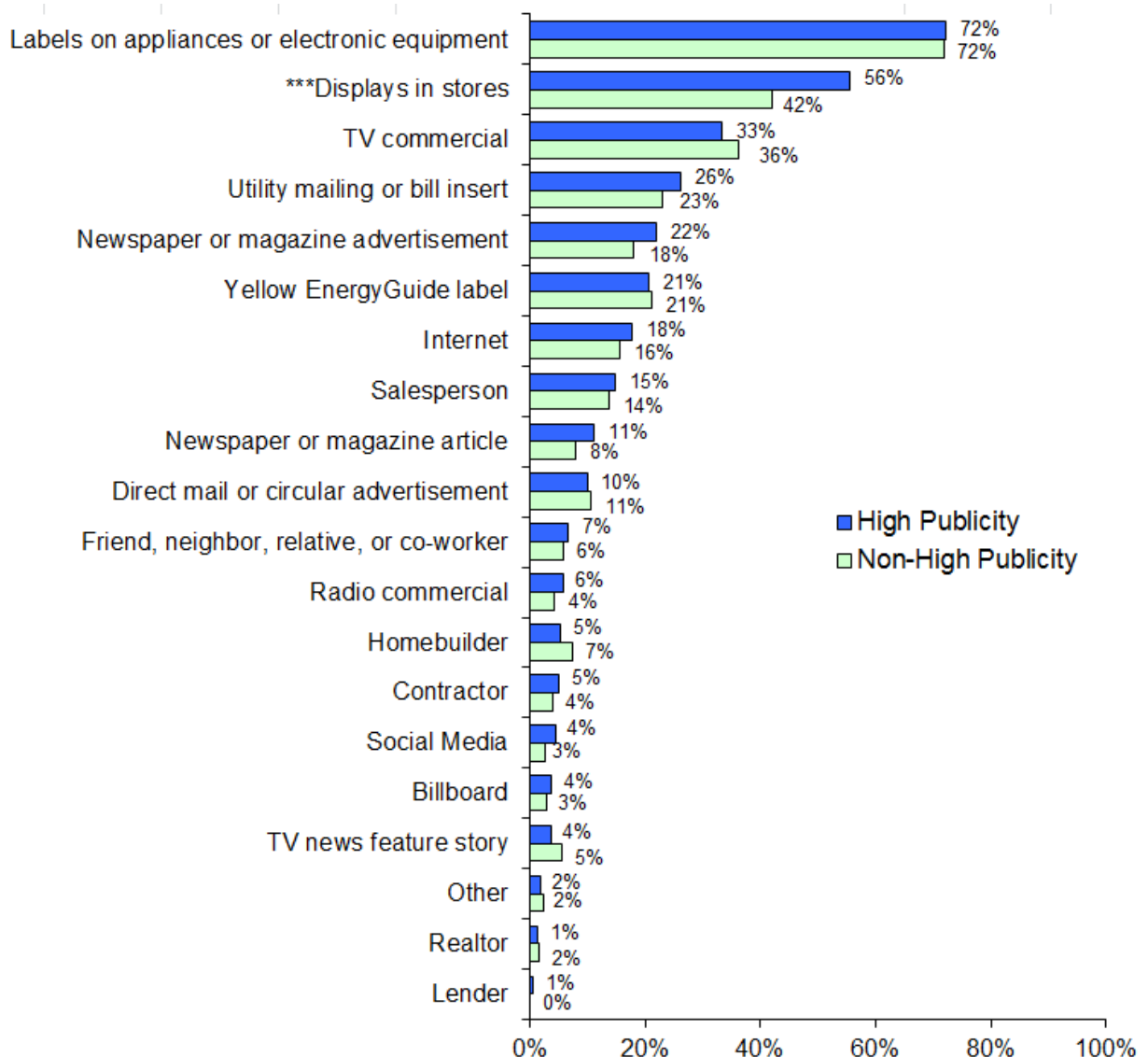
*** 2015 and 2014 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01). Proportion of households in 2015 is larger than in 2014 for social media.

** 2015 and 2014 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05). Proportion of households in 2015 is smaller than in 2014 for realtors.

Sources Seen by Publicity Category

The proportion of households that heard or saw something about ENERGY STAR from displays in stores was significantly larger in high- than in non-high-publicity areas (56 percent and 42 percent, respectively). This difference is statistically different at the 1-percent level (p-value = 0.0015). All remaining sources of information are not significantly different between high- and non-high-publicity areas.

Sources Saw or Heard Something About ENERGY STAR by Publicity Category
[Base = Recognize label (aided), n = 757]



*** High- and non-high-publicity area proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01).

APPENDIX A: DETAILED METHODOLOGY

During October and November of 2015, the Consortium for Energy Efficiency (CEE) fielded a questionnaire to obtain information at the national level on consumer awareness and understanding of the ENERGY STAR label, the value accrued to the label in the eyes of consumers, satisfaction with labeled products, and other ENERGY STAR-related information. The questionnaire was similar to the Internet/WebTV-based questionnaires fielded in previous years (2001 through 2014). As in the 15 previous years, CEE and its members sponsoring the survey made the survey data available to the U.S. Environmental Protection Agency (EPA) for analysis. In 2001, a rigorous comparative analysis of the results obtained via a mail survey versus an Internet survey was conducted. The results from the two survey methods were comparable for most major indicators.⁹ Results from that time-frame were also analogous to telephone surveys for aided recognition.¹⁰

This report discusses the results of the 2015 CEE ENERGY STAR Household Survey, building on prior years' survey results and focusing on the extent to which consumers recognized the ENERGY STAR label, understood its intended messages, and utilized (or were influenced by) the label in their energy-related purchase decisions. Research questions of interest included:

- Where do consumers see or hear about the ENERGY STAR label?
- How does increased publicity impact consumer ENERGY STAR label recognition, understanding, and influence?
- Which key messages about the ENERGY STAR label are consumers retaining?
- Do consumers demonstrate loyalty to the ENERGY STAR label?

The survey was fielded from October 21 through November 2, 2015.¹¹

The remainder of Appendix A discusses the questionnaire design, sampling and weighting methodologies, data collection, and the national analysis. See Appendix D for survey questions.

⁹ National Analysis of CEE 2001 ENERGY STAR Household Surveys. U.S. EPA, 2002.

¹⁰ Tannenbaum, Bobbi and Shel Feldman. "ENERGY STAR Awareness as a Function of Survey Method." IEPEC, 2001.

¹¹ The 2014 survey was fielded from November 11 to November 20, the 2013 survey was fielded from September 17 to October 1, the 2012 survey from October 4 to October 15, and the 2011 survey from September 27 to October 10. It is not known whether this shift in timeframe had an influence on 2015 results.

1. QUESTIONNAIRE DESIGN

In 2015, CEE conducted the ENERGY STAR survey using a questionnaire designed to be delivered by Internet/WebTV. The survey was conducted via an interactive Internet format with a random sample of households that are members of an Internet-based panel. Both the panel as a whole and the sample of households completing the survey were selected by address-based sampling (ABS) and recruited by telephone.¹² Participants in this survey were then randomly selected from the panel. Only one member per household in the random sample was contacted. Households selected for previous years' surveys were not eligible to participate in the 2015 survey.

The panel is designed to be representative of the U.S. population. Panel members without their own Internet access are provided with a laptop and an Internet service connection. Households that already have Internet service receive other incentives to participate in the panel. Panel members respond to questionnaires administered to them via the Internet. They receive no more than three to four short questionnaires each month, and are expected to respond to a certain percentage of them.

Data collected using the 2015 Internet questionnaire may in most cases be compared with data collected using the Internet questionnaires fielded in previous years, for which CEE was also responsible.

1.1 Survey Objectives

CEE had several broad objectives in designing the 2015 questionnaire including:

- To fine-tune the questionnaire based on lessons learned from prior years' analyses, while maintaining the ability to analyze the results against those from the 2014 CEE survey.

¹² In previous years, the panel was recruited via random-digit dial. GfK believes that ABS offers advantages, including coverage of cell-phone-only households, and analysis of non-response bias. More information is available at: <http://www.knowledgenetworks.com/accuracy/fall-winter2010/abs-fall2010.html>.

The 2015 Internet questionnaire addressed the following:

- Respondent recognition and understanding of the ENERGY STAR label.
- Key messages communicated by the ENERGY STAR label.
- Products on which respondents have seen the ENERGY STAR label.
- Products that respondents have shopped for or purchased in the past year.
- Products that respondents have purchased that displayed the ENERGY STAR label on the product, packaging, or instructions.
- Influence of the presence or absence of the ENERGY STAR label on the purchase decision.
- Whether purchases of ENERGY STAR-labeled products involved rebates or reduced-rate financing.
- Likelihood of having purchased ENERGY STAR-labeled products in the absence of rebates or reduced-rate financing.
- Likelihood of recommending ENERGY STAR-labeled products to a friend and other measures of loyalty to the ENERGY STAR label.
- Satisfaction with ENERGY STAR-labeled products versus products without the ENERGY STAR label.
- Demographic questions (most of the demographic questions were not asked in the Internet survey as the demographic characteristics of the respondents were already on file).
- Respondent recognition and understanding of ENERGY STAR Most Efficient and ENERGY STAR “Connected”.

1.2 Internet Questionnaire

The interactive format of an Internet questionnaire allows questions to be asked in a way that is not possible with a printed questionnaire. On printed questionnaires, respondents can see questions in advance and may be tempted to read the entire questionnaire before completing it, potentially educating themselves in a limited way about the subject and affecting their responses.

The Internet questionnaires ask respondents—without showing the ENERGY STAR label—whether they have ever seen or heard of the ENERGY STAR label. Responses to this question should thus be comparable to those obtained through a telephone survey. The Internet questionnaires then show the ENERGY STAR label(s) (which is not possible with a telephone survey) and ask again about recognition and understanding. As a result, responses to these questions should be comparable to those obtained through a mail survey where respondents are shown the label.

Another difference between a mail questionnaire and an Internet questionnaire is that the latter—like a telephone questionnaire using computer-assisted telephone interviewing (CATI)—can program lines of questions based on responses to earlier questions. For example, respondents to an Internet questionnaire who say they bought a given product in the past year can then be asked whether that specific product (or its packaging or instructions) had the ENERGY STAR label.

Thus, the Internet survey is able to combine some of the attributes of both print and telephone surveys.

1.3 Changes to the Questionnaire

The 2015 questionnaire was very similar to the 2014 questionnaire. The only change to the 2015 questionnaire from the previous year was the addition of a new question.¹³

In 2015, the below new question was asked to light bulb installers to better capture the different types of bulbs primarily purchased and installed.

Q12d_1: What kind of bulb(s) did you purchase? Please indicate the primary type purchased:

- Compact fluorescent light bulb (CFL)
- Incandescent light bulb
- Halogen light bulb
- Light-emitting diode (LED)
- Don't know

¹³ Appendix D: 2015 Survey Questions and Flow Chart provide a graphical presentation of the survey questions and skip patterns.

1.4 Determination of Aided Recognition

In the 2015 analysis, the determination of *aided* recognition was based on the responses to five questions. This is the same sequence and numbering used in the 2014 survey. Specifically:

ES3A: Is this the label you have seen or heard of before? (Respondents were randomly shown either the old or new ENERGY STAR label. This question was asked to respondents who said they had seen or heard of the ENERGY STAR label.)

ES3B: Have you seen or heard of this version of the ENERGY STAR label? (In this question, asked after ES3A, respondents were shown the label not shown in the previous question.)

ES3C: Please look at the ENERGY STAR label on the left. Have you ever seen or heard of this label? (Respondents were randomly shown either the old or new ENERGY STAR label. This question was asked to respondents who said they had not seen or heard of or didn't know whether they had seen or heard of ENERGY STAR.)

ES3D: Have you seen or heard of this version of the ENERGY STAR label? (In this question, asked after ES3C, respondents were shown the label not shown in the previous question.)

ES6: Now that you had the opportunity to see the ENERGY STAR label, do you recall seeing or hearing anything about it before this survey? (This question was asked to respondents who answered "no" or "don't know" to ES3A and ES3B. It was also asked to all respondents who answered ES3C and ES3D.)

- Respondents who answered ES3A, ES3B, ES3C, ES3D, or ES6 "yes" were categorized as recognizing the ENERGY STAR label (aided).
- Respondents who did not answer ES3A, ES3B, ES3C, or ES3D "yes" and answered ES6 "no," were categorized as not recognizing the label (aided).
- Respondents who did not answer ES3A, ES3B, ES3C, or ES3D "yes" and answered ES6 "don't know" or refused to answer ES6 were not included in the analysis of aided recognition. (Their data were set to missing.)

2. SAMPLING

2.1 Designated Marketing Areas' Publicity Categories

The same publicity classification procedure used in the past 14 years was used in 2015. The original intent of the classification was to be able to assess the effect of local energy efficiency program publicity on awareness. The majority of these local efficiency programs historically have been supported by utility rate-payer funded energy efficiency programming.

The same publicity classification procedures have been used in each of the past 14 years, which was based on the following criteria:

- **High publicity:** Active local ENERGY STAR program *recently* sponsored by a utility, state agency, or other organization for 2 or more continuous years. The activities must include *sustained* promotions and publicity from non-federal sources.
- **Low publicity:** Federal campaign activities only and no *significant* regional program sponsor activities.
- **Other:** All other DMAs.

In 2009 a decision was made to retain the prior year's publicity classification of the 57 largest DMAs – in essence preserving the historical classification for future study years.

The key working definitions are:

- **Recent:** The 2 years of activity must include the time period during which the survey was in the field.
- **Sustained:** The 2 years of activity must be continuous.
- **Significant:** In addition to any direct federal publicity efforts, publicity efforts must include a deliberate and multifaceted regional program sponsor investment in ENERGY STAR programming, such as direct marketing efforts or the creation and distribution of promotional material.

Each of the Top 57 DMAs was classified according to these three criteria, and sampled based on that classification. For the purpose of this report, *low publicity* and *other publicity* are combined in the analysis and referenced as *non-high-publicity areas*. One reason for combining these categories in the analysis is that over time, the population of low-publicity DMAs has dropped to about 15 percent, while high- publicity DMAs now account for about half of U.S. television households.

2.2 Sample Design

The sampling frame for this national survey included all households in any DMAs that together accounted for about 70 percent of U.S. television households. As in prior years, to facilitate comparison across years, the national results were based only on data collected from respondents from the 57 largest DMAs.¹⁴

CEE members may choose to sponsor more intensive sampling (i.e., an oversample) in selected localities. In 2015, no CEE member chose to sponsor an oversample.

As in previous years' studies, the Top-57 DMAs in the sampling frame were classified by publicity category, so the effect of local energy-efficiency program publicity on national awareness could be considered. The same publicity classification procedure used in the past 14 years was used this year.

Program publicity has expanded over the past fifteen years. Originally, high-publicity, low-publicity, and other groups had similar numbers of households, and so the sample was allocated equally among the three groups. Beginning in 2010, the number of respondents in each stratum was chosen in proportion to that stratum's share of the U.S. population living in DMAs. As in the past for the national sample, the three publicity categories (the top 57 DMAs) comprise 1,000 respondents.

A list of the large DMAs and their publicity category assignments is provided in the table below. A map that shows the large DMAs and their publicity categories follows.

¹⁴ Analysis included in the 2010 report showed no statistical difference for key metrics between the 57 largest DMAs and all 210 DMAs.

Large (Top 57) DMAs¹⁵

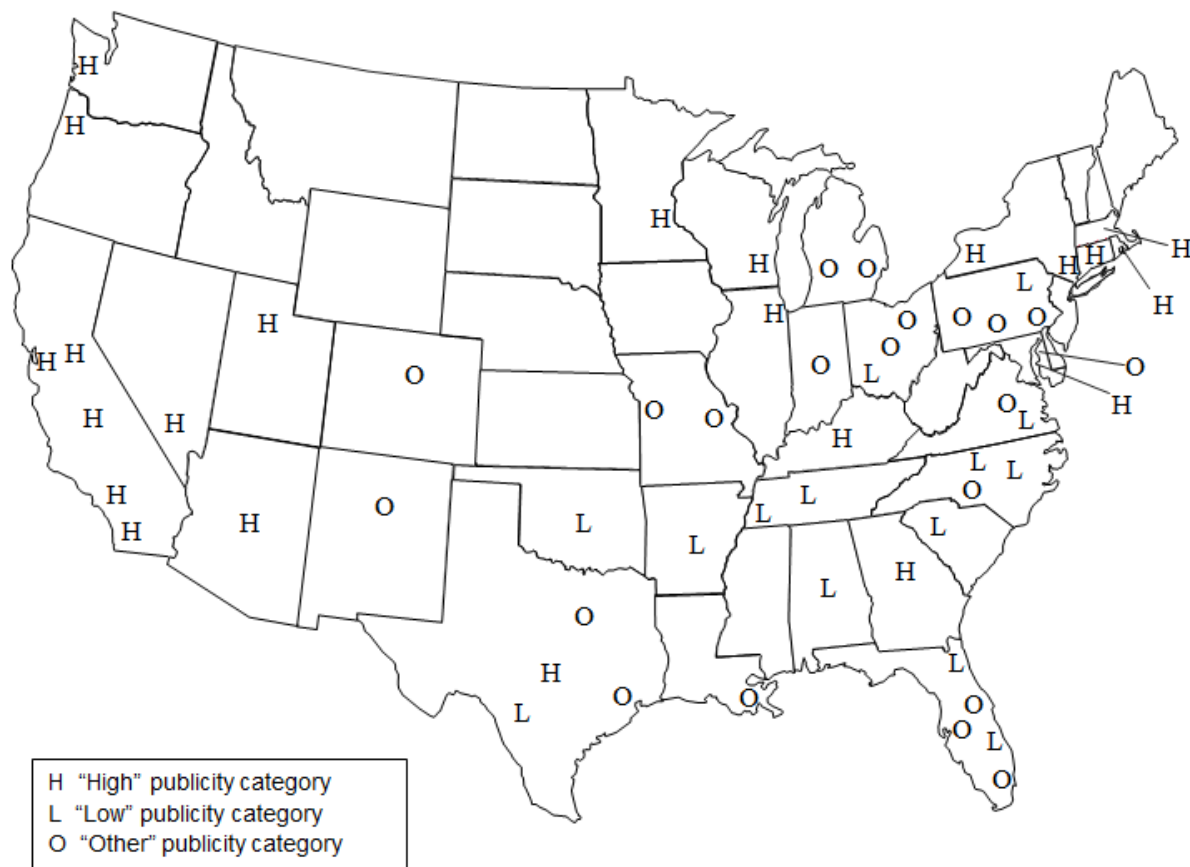
| Rank | Designated Market Area (DMA) | TV Households 2014-2015 | | Publicity Category |
|------|---|----------------------------|------------|-----------------------|
| | | Number | % of US | |
| 1 | New York | 7,442,270 | 6.539 | High |
| 2 | Los Angeles | 5,523,800 | 4.854 | High |
| 3 | Chicago | 3,477,250 | 3.055 | High |
| 4 | Philadelphia | 2,953,760 | 2.595 | Other |
| 5 | Dallas-Ft. Worth | 2,603,680 | 2.288 | Other |
| 6 | San Francisco-Oak-San Jose | 2,476,860 | 2.176 | High |
| 7 | Boston (Manchester) | 2,423,640 | 2.130 | High |
| 8 | Washington, DC (Hagrstwn) | 2,408,990 | 2.117 | High |
| 9 | Atlanta | 2,334,520 | 2.051 | High |
| 10 | Houston | 2,301,230 | 2.022 | Other |
| 11 | Phoenix (Prescott) | 1,834,360 | 1.612 | High |
| 12 | Detroit | 1,833,320 | 1.611 | Other |
| 13 | Tampa-St. Pete (Sarasota) | 1,822,550 | 1.601 | Other |
| 14 | Seattle-Tacoma | 1,802,920 | 1.584 | High |
| 15 | Minneapolis-St. Paul | 1,730,170 | 1.520 | High |
| 16 | Miami-Ft. Lauderdale | 1,632,760 | 1.435 | Other |
| 17 | Denver | 1,565,760 | 1.376 | Other |
| 18 | Orlando-Daytona Bch-Melbrn | 1,472,960 | 1.294 | Other |
| 19 | Cleveland-Akron (Canton) | 1,469,190 | 1.291 | Other |
| 20 | Sacramnto-Stkton-Modesto | 1,345,960 | 1.183 | High |
| 21 | St. Louis | 1,226,860 | 1.078 | Other |
| 22 | Pittsburgh | 1,173,320 | 1.031 | Other |
| 23 | Portland, OR | 1,154,070 | 1.014 | High |
| 24 | Charlotte | 1,154,040 | 1.014 | Other |
| 25 | Raleigh-Durham (Fayetteville) | 1,135,920 | 0.998 | Low |
| 26 | Baltimore | 1,092,620 | 0.960 | Other |
| 27 | Indianapolis | 1,082,690 | 0.951 | Other |
| 28 | San Diego | 1,054,350 | 0.926 | High |
| 29 | Nashville | 1,002,840 | 0.881 | Low |
| 30 | Hartford & New Haven | 968,450 | 0.851 | High |
| 31 | Kansas City | 923,290 | 0.811 | Other |
| 32 | Columbus, OH | 913,550 | 0.803 | Other |
| 33 | San Antonio | 911,680 | 0.801 | Low |
| 34 | Salt Lake City | 897,390 | 0.789 | High |
| 35 | Milwaukee | 893,210 | 0.785 | High |
| 36 | Cincinnati | 876,290 | 0.770 | Low |
| 37 | Greenville-Spartanburg-Asheville-Anderson | 842,020 | 0.740 | Low |
| 38 | West Palm Beach-Ft. Pierce | 789,710 | 0.694 | Low |

¹⁵ Publicity categories are the same as 2014.

| Rank | Designated Market Area (DMA) | TV Households 2014-2015 | | Publicity Category |
|--------------|------------------------------|----------------------------|---------|-----------------------|
| | | Number | % of US | |
| 39 | Austin | 729,300 | 0.641 | High |
| 40 | Grand Rapids-Kalmzoo-B.Crk | 724,100 | 0.636 | |
| 41 | Las Vegas | 718,820 | 0.632 | High |
| 42 | Norfolk-Portsmth-Newpt Nws | 714,410 | 0.628 | |
| 43 | Birmingham (Ann and Tusc) | 710,180 | 0.624 | Low |
| 44 | Oklahoma City | 704,490 | 0.619 | |
| 45 | Harrisburg-Lncstr-Leb-York | 704,160 | 0.619 | Other |
| 46 | Greensboro-H.Point-W.Salem | 689,040 | 0.605 | |
| 47 | Albuquerque-Santa Fe | 679,380 | 0.597 | Other |
| 48 | Jacksonville | 659,630 | 0.580 | |
| 49 | Louisville | 656,900 | 0.577 | High |
| 50 | Memphis | 653,560 | 0.574 | |
| 51 | New Orleans | 641,150 | 0.563 | Other |
| 52 | Buffalo | 612,110 | 0.538 | |
| 53 | Providence-New Bedford | 605,930 | 0.532 | High |
| 54 | Fresno-Visalia | 568,900 | 0.500 | |
| 55 | Wilkes Barre-Scranton-Hztn | 563,540 | 0.495 | Low |
| 56 | Little Rock-Pine Bluff | 555,370 | 0.488 | |
| 57 | Richmond-Petersburg | 548,680 | 0.482 | Other |
| Total | | 80,987,900 | 71.161 | |

Large (Top 57) DMAs by Publicity Category¹⁶

2015



¹⁶ There were no large DMAs in either Alaska or Hawaii.

2.3 Weighting Procedures

GfK, the company that provided the Internet survey service, developed the weights used in the analysis. GfK first adjusted its panel members for known disproportions due to the panel's original selection and recruitment design and then proceeded with a post-stratification weighting that accounted for differences between the panel and the U.S. population. The adjustment to this typical sampling weight approach was based on geographic and demographic characteristics known for both the panel and the population (refer to Appendix B). It effectively scales up under-represented population dimensions in the panel and scales down dimensions that are over-represented in the panel. This more closely aligned the panel with the basic demographic characteristics of the U.S. population.

After the field data were collected, GfK further adjusted the sampling weight to account for survey non-response. The correction for survey non-response is analogous to the adjustment for differences between the panel members and the U.S. population. It was based on geographic and demographic characteristics known for both the sample of panel survey completes and the entire sampling frame for the study. The weighting scaled up under-represented population dimensions and scaled down over-represented dimensions in the sample of survey completes. This more closely aligned the sample of survey completes with the basic demographic characteristics of the entire sampling frame for the study.

3. DATA COLLECTION

3.1 Survey Fielding Period

The survey began on October 21 and closed on November 2, 2015.

3.2 Response Rate

The overall response rate was 7 percent for the CEE 2015 ENERGY STAR Household Survey. This level of response is typical for GfK's surveys.

For an Internet survey, the response rate is defined as the product of the *return rate*, which is survey-specific, and the *recruitment rate*. The *return rate* is the ratio of the number of questionnaires completed to the number of panel members asked to complete the questionnaire. For the CEE 2015 ENERGY STAR Household Survey, the return rate was 51 percent. While this number is quite high, it must be adjusted by the *recruitment rate*, which is the number of households that agreed to participate in GfK's panel as a proportion of the number of households asked to participate. The recruitment rate was 13 percent. Thus, the response rate for the CEE 2015 ENERGY STAR Household survey was the product of the survey-specific return rate of 51 percent and the recruitment rate of 13 percent. This product is equivalent to the ratio of the number of questionnaires completed to the number of households that were offered the opportunity to be in the study.

CEE 2015 ENERGY STAR Household Survey Response Rate¹⁷

| Response Rate Factors | Number or % of Respondents |
|------------------------------|---|
| Sendout/requested | 1,965 |
| Completed | 1,000 |
| Return rate | 51% |
| Recruitment rate | 13% |
| Response rate | 7% |

¹⁷ Only respondents from Top57 DMAs are included in this table.

4. NATIONAL ANALYSIS

4.1 DMAs Included

To facilitate comparisons across years, the national results were based only on data collected from respondents from the 57 largest DMAs. In 2015, data were only collected from respondents in the 57 largest DMAs.

4.2 Treatment of “Don’t Know” Responses and Refusals

For most questions, how “don’t know” responses or refusals are handled has a negligible effect on the results. Still, it is necessary to make a decision as to how they should be handled. The results presented in this report for a given question do not include “don’t know” responses or refusal to answer (i.e., the results for a given question were calculated after any “don’t know” responses to that question or refusals to answer that question were set to missing).

APPENDIX B: DEMOGRAPHICS

This appendix presents the relationship between the demographic characteristics found in the weighted survey data and the corresponding characteristics in the study population of all U.S. households. Professional survey and data collection firms make significant efforts to ensure the rigor of their methods and to produce the highest quality results. Each year, GfK—the company that maintains the Internet-based survey panel used in this analysis—strives to create a panel that is representative of the U.S. population. However, as in any survey effort, those who respond to surveys tend to be different from those who do not. In this case, the panel used for this survey may contain subjects that are receptive to the incentive-for-service tradeoff and introduce associated biases.

Weighting used in the analyses of this report is applied to account for differences between the Internet-based panel and the U.S. population. If weighting was accomplished perfectly, the distribution of various demographic characteristics in the weighted survey data would be the same as the distribution of those characteristics in national Census data. For most demographic characteristics, the two distributions are quite similar. This suggests the weighted survey results are a reasonable representation of the study population. A summary of the comparisons of demographic characteristics is provided in the table below. Detailed comparisons are provided in tables presented at the end of this appendix.

Summary of Distribution Comparisons

| Demographic Characteristic | Largest Difference (Absolute Value): Survey Estimate Less Census % | |
|-----------------------------------|---|----------|
| Number of persons in household | One | 8.3% |
| Householder/respondent age | 18-24 ^a | 8.7% |
| Householder/respondent gender | Gender | +/- 0.7% |
| Dwelling type | Single-family, attached | 4.6% |
| Own/rent | Own/rent | +/- 1.5% |
| Household annual income | \$75,000 and over ^b | 10.3% |

^aCensus, under 25 years; WebTV/Internet, 18-24 years.

^bCensus, \$50,000-\$80,000 and \$80,000 and over.

The largest differences (in absolute value) between the weighted survey data and national Census data, at 10.3 and 8.7 percentage points, are the proportion of households in the \$75,000 and over income category and the proportion of householder/respondent age 18-24, respectively. The difference in the proportion of one person households is the third largest, at -8.3 percentage points, and the number of single-family, attached home dwellings is the fourth largest, at 4.6 percentage points. The combined under-representation of single-person households and over-representation of higher income households are not expected to bias the survey results in any particular direction. Differences between the weighted survey data and Census data for other demographic characteristics of the population—own/rent, and gender—are all quite small, at less than two percentage points and one percentage point, respectively.

Household Size Distribution

| Number of Persons in Household | Census % Dwelling Units ^a | Survey Estimate Minus Census % Dwelling Units |
|--------------------------------|--------------------------------------|---|
| One | 28% | -8.3% |
| Two | 33% | 1.2% |
| Three | 16% | 2.0% |
| Four | 13% | 2.2% |
| Five or more | 10% | 2.9% |
| Total (%) | 100% | |
| Total (1,000s) | 115,894 | |

^a U.S. Census Bureau, American Housing Survey, 2013, Table C-08-AO.

Age Distribution

| Householder/ Respondent Age | Census % Householders ^a | Survey Estimate Minus Census % Householders |
|-----------------------------------|---------------------------------------|--|
| 18-24 ^b | 4% | 8.7% |
| 25-34 | 17% | -1.4% |
| 35-44 | 17% | 0.8% |
| 45-54 | 20% | -2.9% |
| 55-64 | 19% | -0.4% |
| 65 or older | 23% | -4.8% |
| Total (%) | 100% | |
| Total (1,000s) | 115,894 | |

^a U.S. Census Bureau, American Housing Survey, 2013, Table C-08-AO.

^b Census, under 25 years; WebTV/Internet, 18-24 years.

Gender Distribution

| Householder/ Respondent Gender | Census % Population ^a | Survey Estimate Minus Census % Population |
|--------------------------------------|--|--|
| Female | 51% | 0.7% |
| Male | 49% | -0.7% |
| Total (%) | 100% | |

^aU.S. Census Bureau, 2008-2013 American Community Survey 5-Year Estimates.

Dwelling Type Distribution

| Dwelling Type | Census % Dwelling Units ^a | Survey Estimate Minus Census % Dwelling Units |
|---------------------------|--|---|
| Single-family, unattached | 65% | 0.5% |
| Single-family, attached | 6% | 4.6% |
| Bldg. (>=2 units) | 24% | -3.5% |
| Mobile home | 5% | -2.7% |
| Total (%) | 100% | |
| Total (1,000s) | 115,894 | |

^a U.S. Census Bureau, American Housing Survey, 2013, Table C-01-AO.

Own/Rent Distribution

| Own/Rent | Census % Households ^a | Survey Estimate Minus Census % Households |
|---------------------------|--|--|
| Own | 65% | 0.0% |
| Rent | 35% | 1.5% |
| Total (%) | 100% | |
| Total (1,000s) | 115,894 | |

^a U.S. Census Bureau, American Housing Survey, 2013, Table C-01-AO.

Income Distribution

| Total Household Annual Income (before taxes) | Census % Households^a | Survey Estimate Minus Census % Households |
|---|--|--|
| Less than \$15,000 | 13% | -4.8% |
| \$15,000-\$24,999 | 11% | -3.3% |
| \$25,000-\$49,999 | 24% | -2.9% |
| \$50,000-\$74,999 | 18% | 0.8% |
| \$75,000 and over | 34% | 10.3% |
| Total (%) | 100% | |
| Total (1,000s) | 122,952 | |

^a U.S. Census Bureau, CPS Annual Social and Economic Supplement 2014, Table HINC-01 Selected Characteristics of Households, by Total Money Income (2013 data).

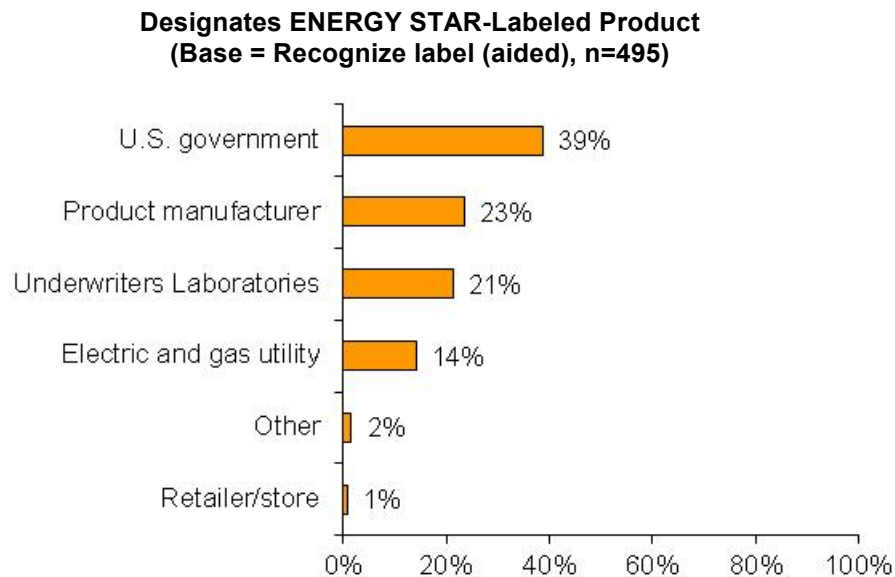
APPENDIX C: ADDITIONAL QUESTIONS FROM 2015 SURVEY

This appendix presents the results of additional ENERGY STAR related questions in the 2015 survey that were added by CEE since 2005; and are not discussed in the main body of the report. Topics included in this appendix include:

- ENERGY STAR Designation
- ENERGY STAR Product Satisfaction
- Consumer Perceptions
- Purchasing Decisions
- Light Bulb Purchaser Questions
- Most Efficient Designation
- ENERGYSTAR.gov Question
- ENERGY STAR “Connected” Questions

1. ENERGY STAR DESIGNATION

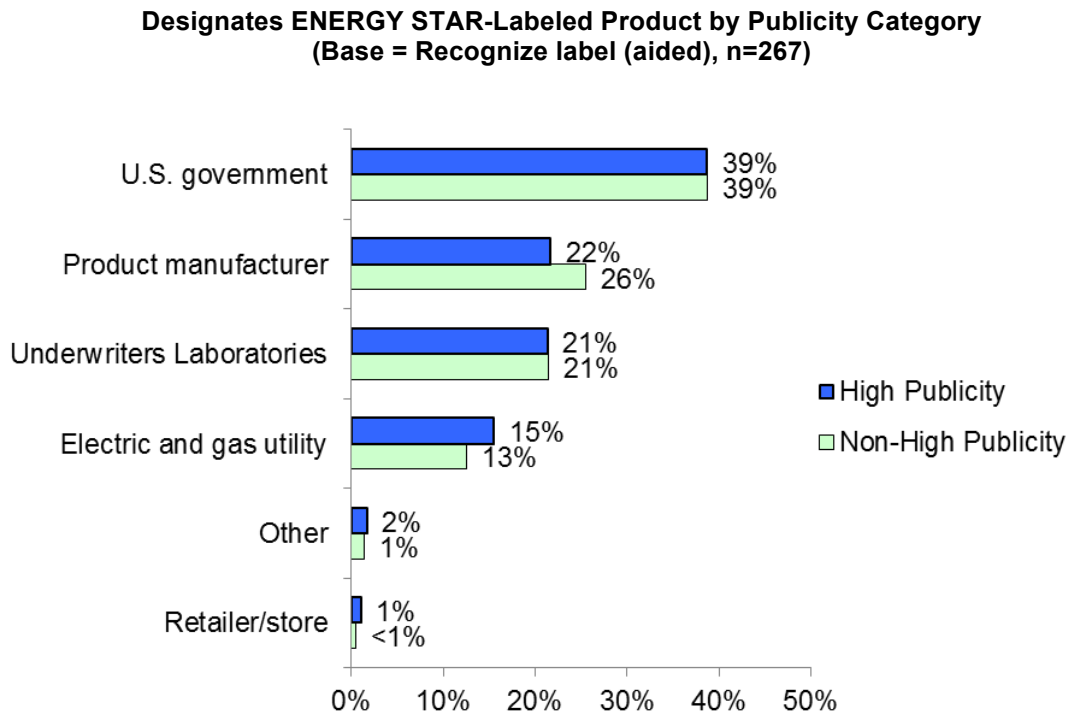
Thirty-nine percent of households that recognized the ENERGY STAR label (aided) thought that the U.S. government decides if a product deserves the label, this proportion of households is similar to 2014 at 36 percent (p-value = 0.4160). Twenty-three percent thought product manufacturers make the decision. Twenty-one percent thought Underwriters Laboratories makes this decision, this was 22 percent in 2014. All 2015 and 2014 proportions are statistically similar to each other.



Note: QB: "As far as you know, who decides if a product deserves the ENERGY STAR label?"

2. ENERGY STAR DESIGNATION BY PUBLICITY CATEGORY

In 2015, high-publicity areas and non-high-publicity areas identified the entity they believed designates the ENERGY STAR label in similar proportions in all categories. Thirty-nine percent in high- and non-high-publicity areas identified the “U.S. government” as the entity that designates the ENERGY STAR label. The second most identified entity was “product manufacturers” at 22 percent in high- and 26 percent in non-high-publicity areas; this difference is not statistically significant (p-value = 0.4078).



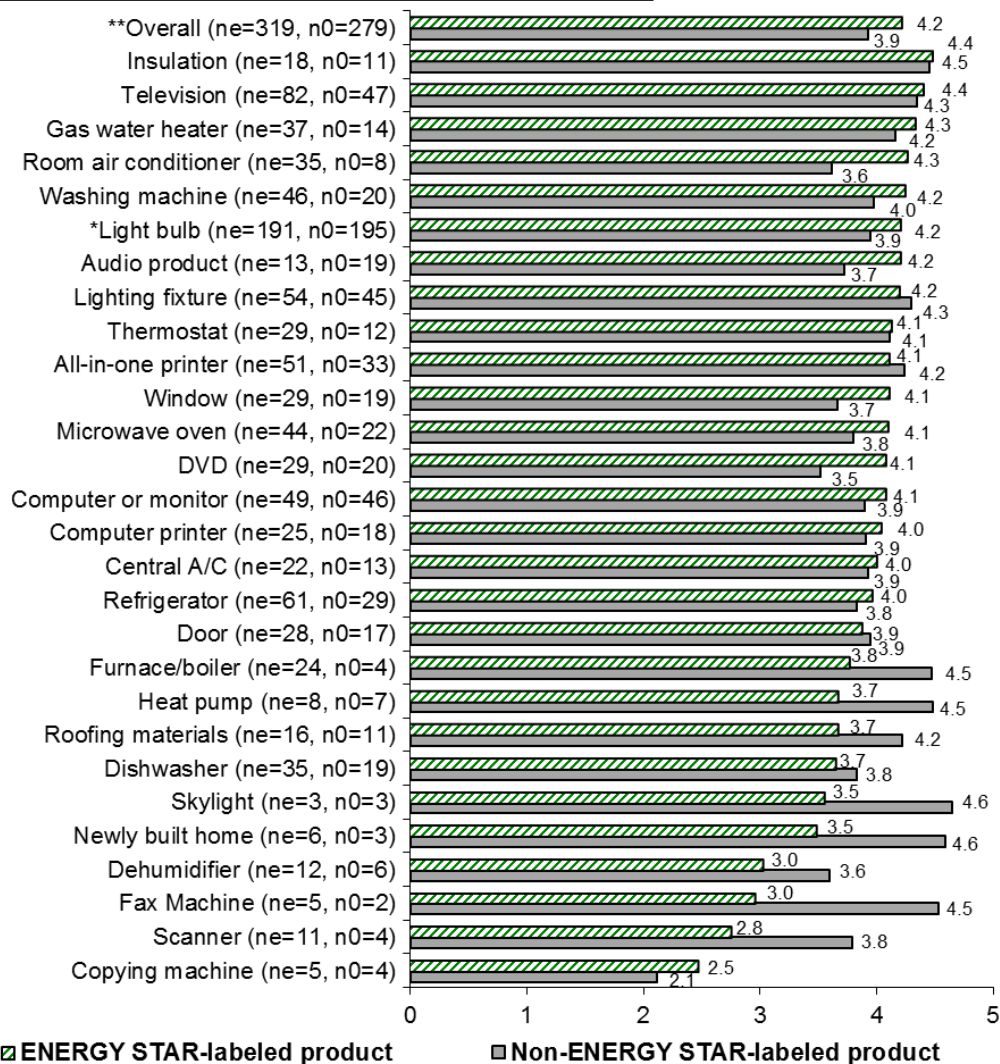
3. ENERGY STAR PRODUCT SATISFACTION

For most products, household satisfaction with a given product in a product category that has an ENERGY STAR specification does not appear to vary based on whether or not the product had an ENERGY STAR label. Respondents were asked to rate their satisfaction on a scale of 1 to 5, where 1 means “very dissatisfied” and 5 means “very satisfied.” Products with the ENERGY STAR label showed significantly higher average satisfaction ratings than the same products without the label, at 4.2 and 3.9 respectively (p-value = 0.0116). In addition, ENERGY STAR-labeled light bulbs received higher satisfaction ratings compared with the unlabeled versions. This difference is statistically significant at the 10-percent level (p-value = 0.0765).

Overall, 2015 customer satisfaction with ENERGY STAR products is similar to 2014 for both ENERGY STAR and non-ENERGY STAR products, (p-value = 0.8460). Two ENERGY STAR-labeled products showed a decrease in customer satisfaction between 2014 and 2015; these products were skylights and roofing materials. These decreases were both significant at the 10-percent level (p-value = 0.0807 and p-value = 0.0831, respectively). In addition, two product categories in the list--thermostats and microwave--are not currently eligible for the ENERGY STAR designation.

ENERGY STAR vs. Non-ENERGY STAR-Labeled Product Satisfaction
(Bases = Recognize label (aided) and purchased specified product^{18,19})

Average Satisfaction (1=very dissatisfied, 5=very satisfied)



** ENERGY STAR and Non-ENERGY STAR product proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

* ENERGY STAR and Non-ENERGY STAR product proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

¹⁸ ne = number of respondents that recognized the label (aided) and purchased this product with an ENERGY STAR label
n0 = number of respondents that recognized the label (aided) and purchased this product without an ENERGY STAR label

¹⁹ There is no ENERGY STAR designation for microwave ovens or thermostats.

4. CONSUMER PERCEPTIONS

Survey respondents that recognized the ENERGY STAR label (aided) were asked to indicate how strongly they agree or disagree with a number of attitudinal statements about ENERGY STAR-labeled products.²⁰ The statements were shown to respondents in random order.

For purposes of discussion, the statements are grouped into four categories:

- Environmental and social responsibility messaging
- Purchasing preference
- Product attributes and performance
- Technology affinity

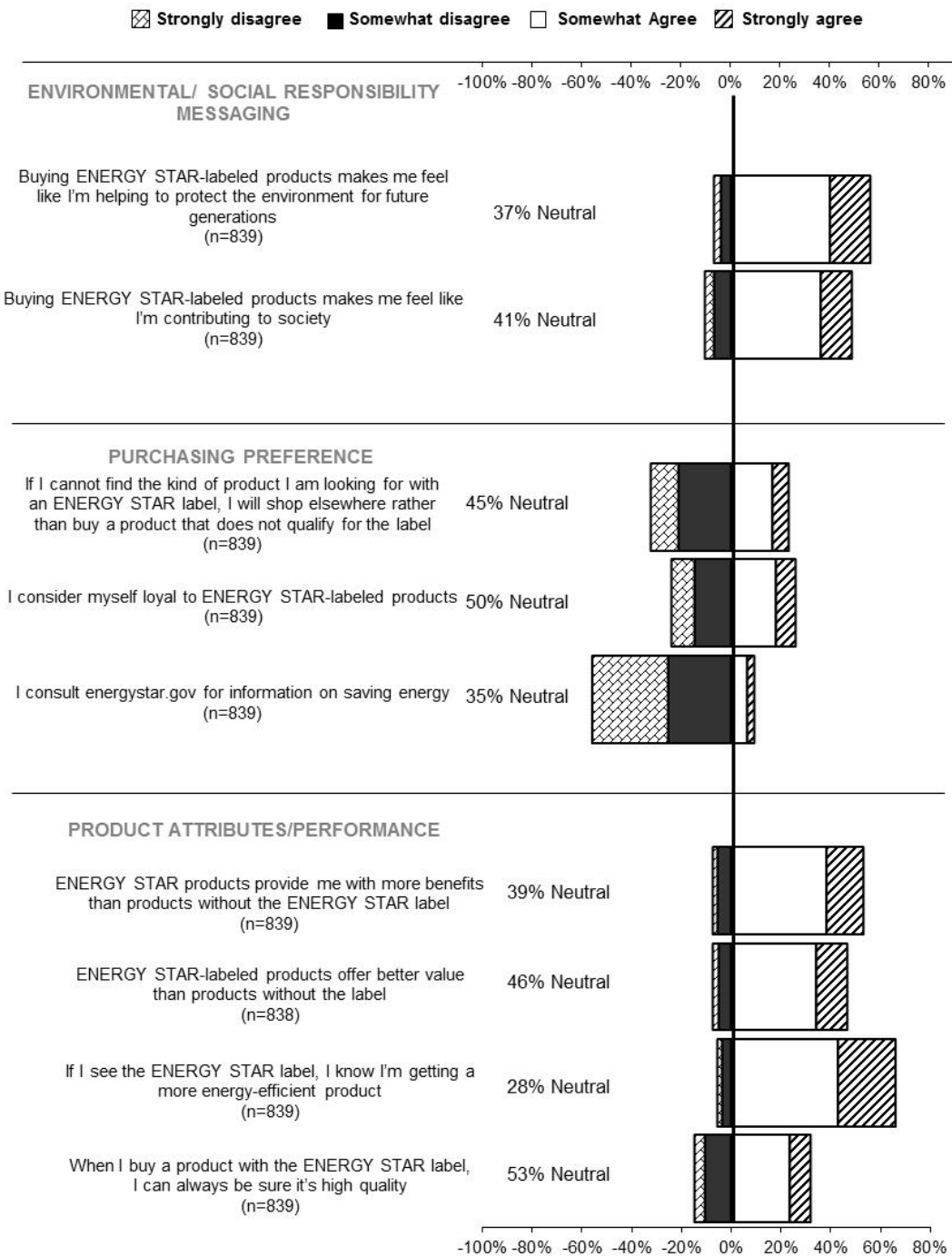
The 2015 survey results indicate that households generally agree with positive statements about the ENERGY STAR label and disagree with negative statements about the label.²¹ Similar to 2014 results, few statements elicit strong agreement or strong disagreement among substantial proportions of households; in contrast, a number of statements generated neutral responses from a sizeable proportion of households. A more detailed discussion of the findings regarding the attitudinal statements is provided on the following pages. Reports in previous years have included a section on consumer perceptions by publicity category. In 2015, there were no statistically significant differences in consumer perceptions between high- and non-high publicity areas.

²⁰ These statements are numbered Q16a through Q16w in the survey.

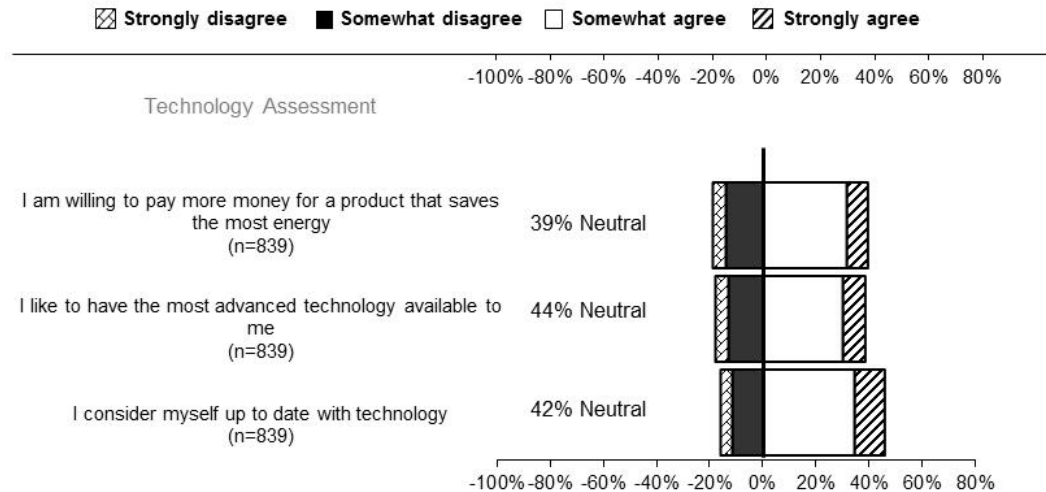
²¹ In this discussion, the term “agree” is used to correspond to survey responses of “strongly agree” or “somewhat agree.” Similarly, the term “disagree” corresponds to survey responses of “strongly disagree” or “somewhat disagree.”

**Response to Categorical Statements Regarding Messaging,
Purchasing, and Product Attributes – Agreement with Positive Statements
(Base = Recognize label (aided))**

For each attitudinal statement, respondents were asked whether they strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree. The response of “neither agree nor disagree” is described as “Neutral” in the chart below and the discussion that follows. In the chart, the results for the “Neutral” response category are shown in text and not depicted in the bar graph. The results for the other four response categories are depicted in the bar graph.

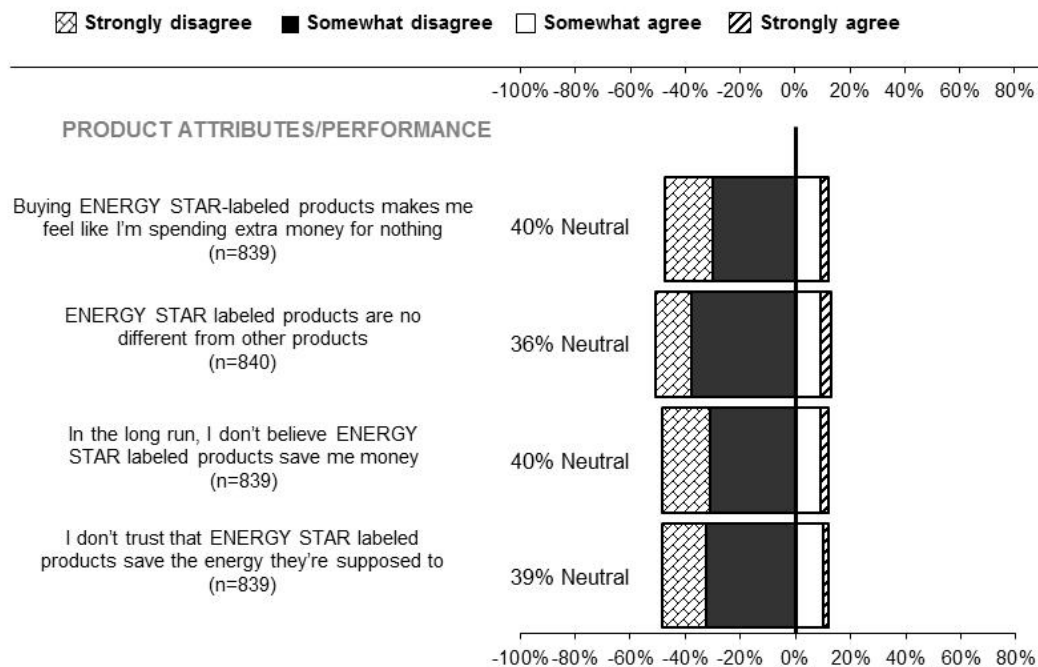


**Response to Categorical Statements Regarding Messaging,
Purchasing, and Product Attributes – Agreement with Positive Statements (Cont.)
(Base = Recognize label (aided))**



**Response to Categorical Statements Regarding Messaging,
Purchasing, and Product Attributes – Disagreement with Negative Statements
(Base = Recognize label (aided))**

For each attitudinal statement, respondents were asked whether they strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree. The response of “neither agree nor disagree” is described as “Neutral” in the chart below and the discussion that follows. In the chart, the results for the “Neutral” response category are shown in text and not depicted in the bar graph. The results for the other four response categories are depicted in the bar graph.



4.1 Environmental and Social Responsibility Messaging

The development of the environmental and social responsibility messaging of the ENERGY STAR label has been a strong focus of the national ENERGY STAR education campaign. In the 2015 survey, two statements addressed the label's messaging in these areas: "Buying ENERGY STAR-labeled products makes me feel like I'm helping to protect the environment for future generations" and "Buying ENERGY STAR-labeled products makes me feel like I'm contributing to society."

Of households that recognize the ENERGY STAR label, the proportion that either strongly or somewhat agree with the statement that by buying ENERGY STAR-labeled products they feel they are helping protect the environment was larger in 2015 (56 percent) than in 2014 (50 percent); this difference is statistically significant at the 5-percent level ($p\text{-value} = 0.0415$). Forty-nine percent of ENERGY STAR aware households strongly or somewhat agree that by purchasing ENERGY STAR-labeled products they feel they are contributing to society; this percentage is larger ($p\text{-value} = 0.0032$) than the 2014 result (41 percent).

4.2 Purchasing Preferences

Increasing consumers' preferences for purchasing ENERGY STAR-labeled products is also an intended outcome of the national education campaign. Three separate statements were included in the 2015 survey to investigate households' views of their purchasing preferences with respect to ENERGY STAR-labeled products. This year, 9 percent of households somewhat or strongly agree with the statement, "I consult energystar.gov for information on saving energy," This is higher than 2014 (7 percent) at the 10-percent significance level ($p\text{-value} = 0.0640$). Thirty-five percent of households in 2015 are neutral, similar to 2014 (32 percent), and 56 percent somewhat or strongly disagree to the statement, decreasing from 61 percent in 2014 ($p\text{-value} = 0.0538$).

In 2015, twenty-three percent of households either strongly or somewhat agree with the statement, "If I cannot find the kind of product I am looking for with an ENERGY STAR label, I will shop elsewhere rather than buy a product that does not qualify for the label." This is similar to 19 percent in 2014 ($p\text{-value} = 0.1050$). Fewer households (32 percent) either strongly or somewhat disagree; this is down from 2014 (38 percent) and is statistically significant at the 5-percent level ($p\text{-value} = 0.0208$). Forty-five percent of households are neutral in their level of agreement or disagreement with this statement of their purchasing behavior; this is similar to 42 percent in 2014 ($p\text{-value} = 0.3953$).

Twenty-six percent of households agree with the statement addressing households' views of their purchasing preferences: "I consider myself loyal to ENERGY STAR products." This is up from 2014 (22 percent) and is statistically significant at the 10-percent level ($p\text{-value} = 0.0730$). Disagreement with this statement was 24 percent, which is down from 2014 (29 percent) and is statistically significant at the 10-percent level ($p\text{-value} = 0.0556$).

4.3 Technology Affinity

Since 2012, the following questions were asked in order to support research interest related to advanced technologies:

- On a scale by the following statement (1 = Strongly Disagree to 5 = Strongly Agree), please indicate how strongly you agree or disagree with the statement, “I am willing to pay more money for a product that saves the most energy.”
- On a scale by the following statement (1 = Strongly Disagree to 5 = Strongly Agree), please indicate how strongly you agree or disagree with the statement, “I like to have the most advanced technology available to me.”
- On a scale by the following statement (1 = Strongly Disagree to 5 = Strongly Agree), please indicate how strongly you agree or disagree with the statement, “I consider myself up to date with technology.”

In 2015, 45 percent of households agree either somewhat or strongly with the statement, “I am willing to pay more money for a product that saves the most energy.” Thirty-nine percent of households are neutral in their level of agreement or disagreement with this statement. Sixteen percent of households either somewhat or strongly disagree with this statement addressing households’ willingness to pay more for a product that saves the most energy. These proportions are statistically similar to the 2014 results, where 45 percent of households agreed, 37 percent were neutral, and 18 percent disagreed with the above statement.

Thirty-eight percent of households agreed (either somewhat or strongly) with the statement, “I like to have the most advanced technology available to me.” Forty-four percent are neutral, and 18 percent disagreed (either somewhat or strongly) with this statement. All of these proportions are similar to the 2014 results with p-values ≥ 0.10 .

When compared to 2014 (44 percent), a smaller proportion of households in 2015 (39 percent) agree (either somewhat or strongly) with the statement, “I consider myself up to date with technology.” This difference is statistically significant at the 10-percent level (p-value = 0.0844). Forty-two percent are neutral compared to 37 percent in 2014. This difference is statistically significant at the 10-percent level (p-value = 0.0651). Nineteen percent somewhat or strongly disagree with this statement; this is statistically similar to the 2014 result (20 percent).

4.4 Product Attributes and Performance

Another goal of the national ENERGY STAR education campaign has been to inform consumers that ENERGY STAR-labeled products are more energy efficient than non-labeled products. The degree to which this goal is being accomplished is addressed in the 2015 survey by asking respondents their level of agreement or disagreement with the statement, “If I see the ENERGY STAR label, I know I’m getting a much more energy-efficient product.” Sixty-six percent of respondents either strongly or somewhat agree with this statement, which is similar to 64 percent in 2014 (p-value = 0.3874). This continues to indicate a perception among consumers that the ENERGY STAR label indicates superior performance with respect to energy efficiency relative to products without the label.

The survey addressed perceptions of product quality. Survey respondents were asked the level at which they agreed or disagreed with the statement, “When I buy a product with the ENERGY STAR label, I can always be sure it’s high quality.” Thirty-two percent of households either strongly or somewhat agree with this statement, 53 percent are neutral and 15 percent disagree with this statement. These results are similar to last year’s results.

A number of attitudinal statements were included in the survey to measure consumers’ perceptions of ENERGY STAR-labeled product value. One of these statements is “ENERGY STAR products provide me with more benefits than products without the ENERGY STAR label.” The results show that 53 percent either strongly or somewhat agree with the statement; this is larger than the 2014 result (41 percent) and is statistically different at the 1-percent level (p-value ≤ 0.0001). A smaller percentage of households disagree in 2015 (7 percent) compared to 11 percent in 2014 (p-value = 0.0062). On another statement regarding product value, “ENERGY STAR-labeled products offer better value than products without the label,” 47 percent of households either strongly or somewhat agree; this is higher than the 2014 result (35 percent) and is statistically significant at the 1-percent level (p-value ≤ 0.0001). Seven percent disagree, which is lower than the 2014 result (11 percent) and is also statistically significant at the 1-percent level (p-value = 0.0055).

The results related to the statement, “Buying ENERGY STAR-labeled products make me feel like I’m spending extra money for nothing” provide additional information on perceptions of product value. In 2015, 47 percent strongly or somewhat disagree with this statement. Forty percent of households in 2015 are neutral, and 12 percent agree with this statement. These results are similar to the 2014 results.

In 2015, the following negative statements about product performance, added in 2010, were included.

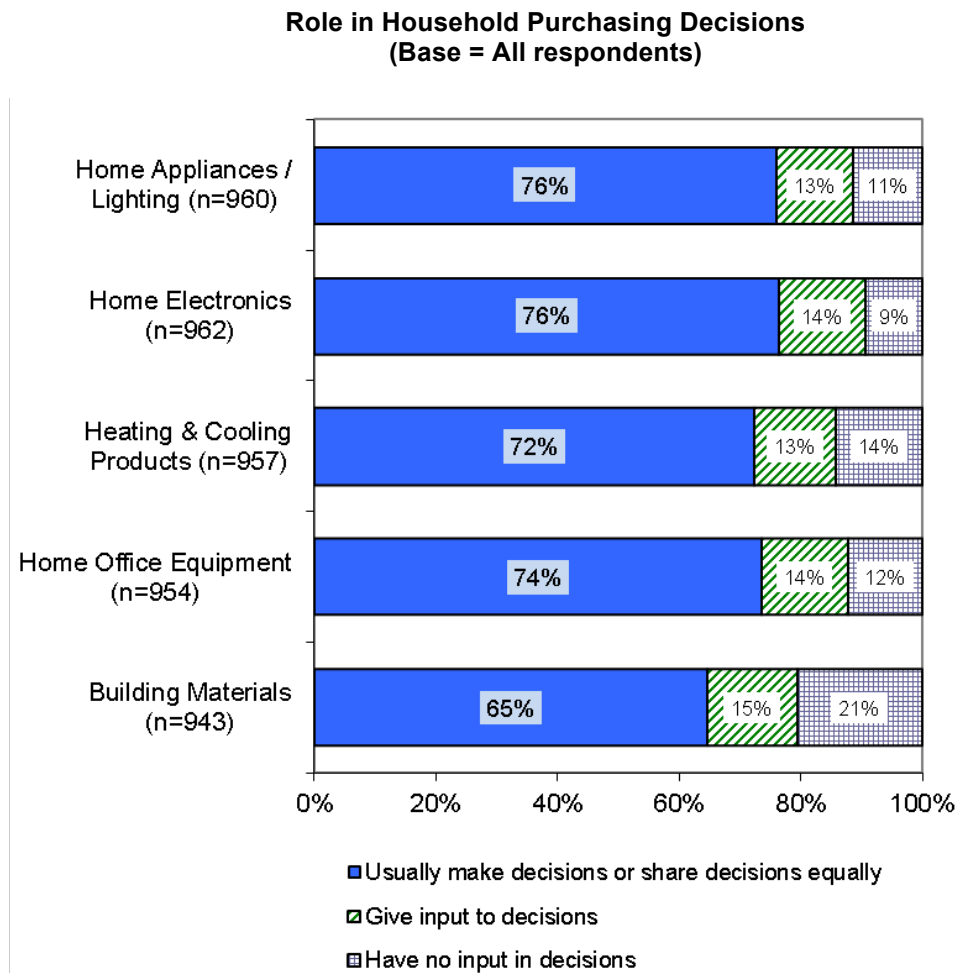
- The statement, “I don’t trust that ENERGY STAR-labeled products save the energy they’re supposed to” had only 12 percent agreement, with over four times as much disagreement (49 percent). The proportions of households that agree and disagree with these statements in 2015 are similar to the 2014 results.
- The statement, “In the long run, I don’t believe ENERGY STAR-labeled products save me money” also had 12 percent agreement; this is the same as the 2014 result. In 2015, 49 percent of households somewhat or strongly disagree with this statement. This is similar to 48 percent in 2014.
- Finally, the statement, “ENERGY STAR products are no different from other products” received only 13 percent agreement and almost four times as much disagreement (51 percent). While disagreement with this statement remained similar to 2014 (54 percent), agreement for this statement rose from 10 percent in 2014. This difference in agreement is significant at the 10-percent level (p-value = 0.0788).

Fifty-one percent of respondents either somewhat or strongly agree with the statement, “It seems like most products have the ENERGY STAR label these days.”²² Only 11 percent disagreed with the statement. This suggests people are recognizing the label on many products. The proportions of households that agree and disagree with these statements in 2015 are similar to the 2014 results.

²² This statement was deemed neither positive nor negative so it does not appear in the previous chart.

5. PURCHASING DECISIONS

At the end of the survey, respondents were asked to characterize their role in the household purchasing decisions. The results indicate that the vast majority of those represented are primary decision makers, meaning they usually make household purchasing decisions alone or share equally in these decisions. As can be seen below, this varies little across product categories. Seventy-six percent of individuals were primary decision makers for their household's home electronics purchases and for home appliance/lighting purchases.



6. LIGHT BULB PURCHASER QUESTIONS

In 2015, 42 percent of all households purchased a light bulb(s). Eighty-seven percent of households that recognized the label and purchased a light bulb saw the ENERGY STAR label on the bulb, packaging, or product literature of the purchased bulb. These results did not vary based on publicity category. All respondents who indicated they had purchased a light bulb(s) in the past 12 months were asked:

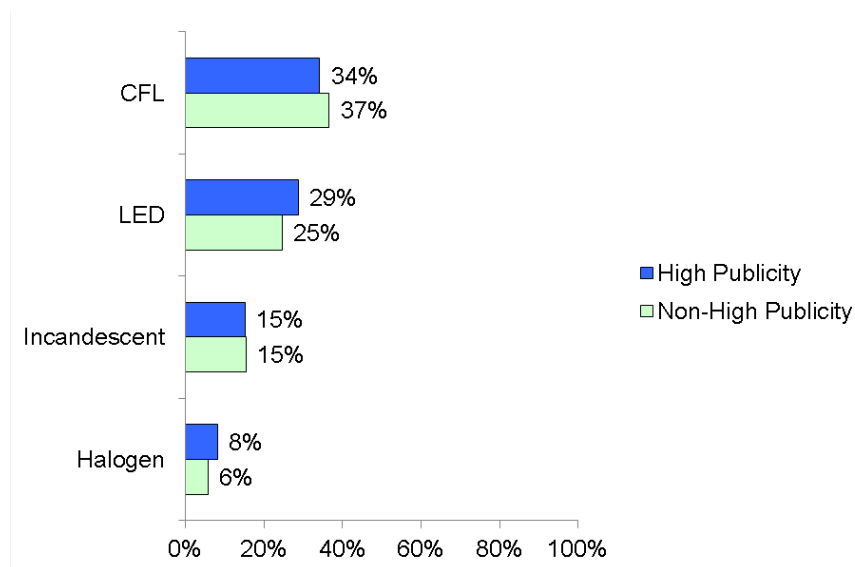
- “Did you install the light bulb(s) you purchased in a light fixture?”

If yes, they’re asked:

- “What kind of bulb(s) did you purchase?” (Please indicate the primary type purchased).
- “What kind of bulb(s) did you replace?” (Check the answer that best describes most of the replacements you made).

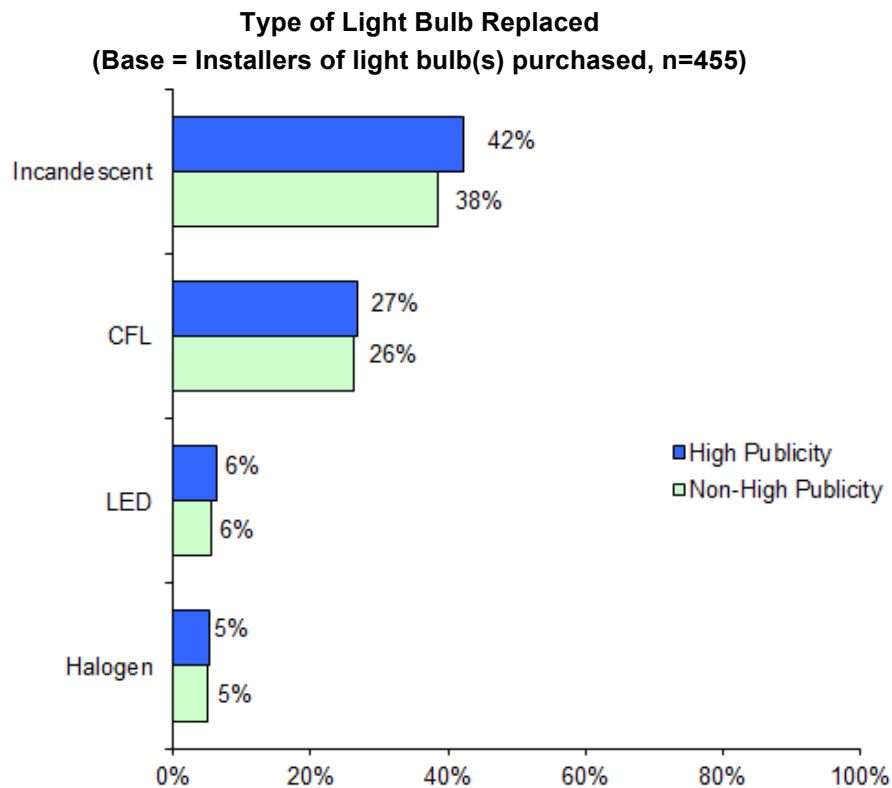
Eighty-eight percent of light bulb purchasers indicated they installed the purchased light bulb. Of these respondents, 35 percent purchased a CFL, 27 percent purchased an LED, 7 percent purchased a halogen and 15 percent purchased an incandescent bulb(s). There were no differences across publicity categories.

Type of Light Bulb Purchased and Installed by Publicity Category
(Base = Installers of light bulb(s) purchased, n=455)



Note: Q12(d_1) “Which type of bulb(s) did you purchase?”

Forty-one percent of respondents replaced an incandescent bulb(s). This proportion was similar to the same group of respondents in 2014 (39 percent). The proportion of households who replaced an LED bulb(s) in 2015 (6 percent) decreased from the proportion of households in 2014 (15 percent). This difference is significant at the 1-percent level (p-value = 0.0001). In addition, 27 percent of households in 2015 replaced CFLs, compared to 35 percent in 2014 and this is significantly different at the 5-percent level (p-value = 0.0169). Lastly, 5 percent of households in 2015 replaced a halogen bulb(s), compared to 10 percent in 2014. This difference is also statistically significant at the 5-percent level (p-value = 0.0150). As shown below, in 2015 results by publicity category are similar.



Note: Q12(e) "Which type of bulb(s) did you replace?"

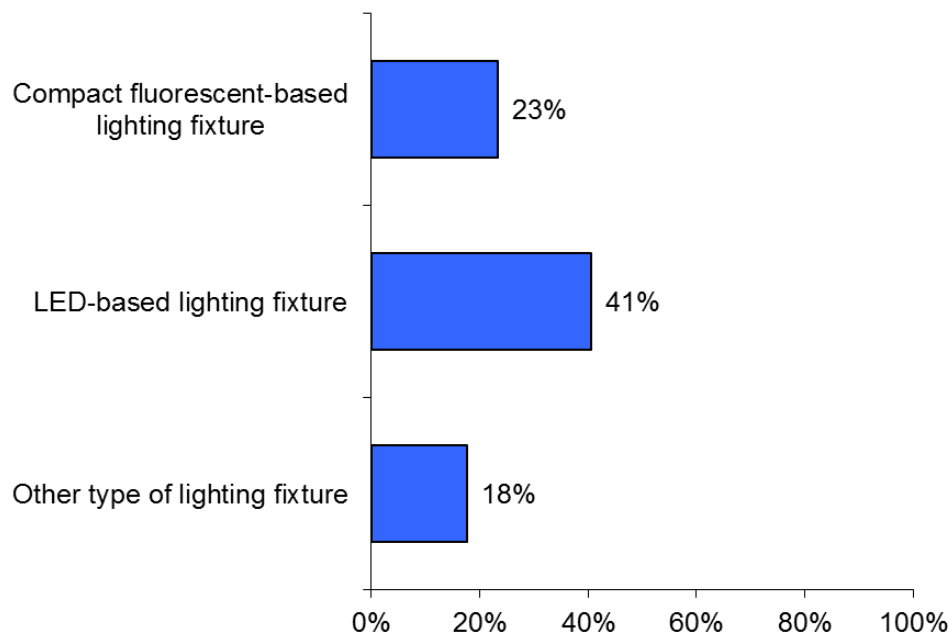
7. LIGHTING FIXTURE PURCHASER QUESTIONS

In 2015, 11 percent of all households purchased fixtures. This is similar to the 2014 proportion (10 percent). Consistent with previous years, purchasers that recognized the ENERGY STAR label were asked if they saw the label on the product(s) they purchased. Respondents that reported purchasing an ENERGY STAR-labeled lighting fixture were asked:

- “Which kind of ENERGY STAR-labeled lighting fixture did you purchase?”

In 2015, 23 percent of ENERGY STAR-labeled lighting fixture purchasers report purchasing a compact fluorescent-based lighting fixture, this is different from the 2014 result (32 percent), (p-value = 0.0390). The proportion of LED fixtures purchased in 2015 (41 percent) is similar to the 2014 result (38 percent), (p-value = 0.8865). For all types of ENERGY STAR-labeled lighting fixtures purchased there are no differences between high- and non-high-publicity areas.

Type of ENERGY STAR-Labeled Lighting Fixture Purchased
(Base = Recognized ENERGY STAR (aided) and
Purchased an ENERGY STAR Lighting Fixture, n=25)



Note: Q8A 1-4. Which kind of ENERGY STAR-labeled lighting fixture did you purchase?

Q8A 1-4 is a multiple response question and therefore does not always sum to 100 percent. In 2015, 21 percent of respondents “Don’t know” the type of ENERGY STAR lighting fixture purchased.

8. ENERGY STAR MOST EFFICIENT QUESTIONS

The 2011 questionnaire added a brief series of questions²³ to collect information on recognition and influence of the ENERGY STAR Most Efficient marketing designation. Only respondents that recognize the ENERGY STAR label (aided) were asked the ENERGY STAR Most Efficient questions. These questions were continued with minor modification in the 2015 survey.

In 2015, 25 percent of households that recognized the ENERGY STAR label (aided) indicated they had seen or heard of ENERGY STAR Most Efficient. This is greater than 21 percent of households in 2014 at the 5-percent significance level (p-value = 0.0399). Among households that had seen or heard of ENERGY STAR Most Efficient:

- Thirty-two percent were aware that products designated ENERGY STAR Most Efficient 2015 represent a subset of ENERGY STAR qualified products within a given product category.²⁴ This is similar to the 2014 result of 29 percent (p-value = 0.6463).
- Just under half (47 percent) recognized the ENERGY STAR Most Efficient marketing graphic when it was shown to them; this is also similar to 42 percent in 2014 (p-value = 0.4754).
- Sixty-three percent of households agreed (either somewhat or strongly) with the statement that “All other things equal, I would buy a product because it is designated as ENERGY STAR Most Efficient.” This result is also similar to last year (56 percent), (p-value = 0.4487).

Response to Statement Regarding Purchase of ENERGY STAR Most Efficient Product [Base = Recognized ENERGY STAR (aided)]

| Would buy a product because it is ENERGY STAR Most Efficient | 2015 (n=107) | 2014 (n=169) |
|--|-----------------|-----------------|
| Strongly disagree | 1% | 8% |
| Somewhat disagree | 2% | 4% |
| Neither agree nor disagree | 33% | 32% |
| Somewhat agree | 42% | 37% |
| Strongly agree | 21% | 19% |
| Total | 100% | 100% |

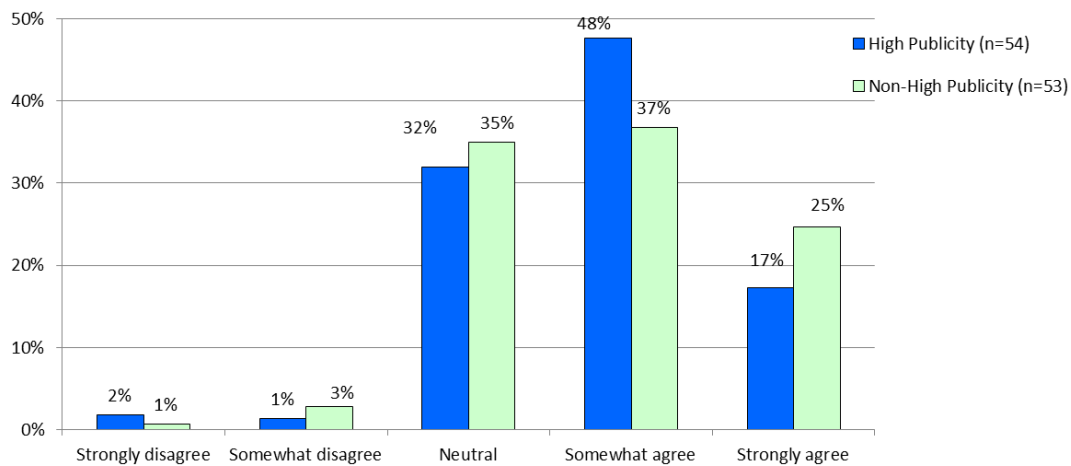
Sixty-five percent of households in high-publicity areas and 62 percent of households in non-high-publicity areas strongly agree or somewhat strongly agree

²³ The ENERGY STAR Most Efficient questions, Q18 – Q22, are shown in Appendix D: 2015 Survey Questions and Flow Chart on page D-9.

²⁴ This question was added to the survey in 2013 (Q20: “Were you aware that products designated ENERGY STAR Most Efficient 2015 represent a subset of ENERGY STAR qualified products within a given product category?”).

with this statement: “All other things equal, I would buy a product because it is designated as ENERGY STAR Most Efficient.” There are no statistical differences at the 10-percent level between high-publicity areas and non-high-publicity areas.

**Response to Statement Regarding Purchase of ENERGY STAR Most Efficient Product
by Publicity Category**
**[Base = Recognized ENERGY STAR (aided) and
Recognized ENERGY STAR Most Efficient (unaided)]**



8.1 ENERGY STAR Most Efficient Influenced (MEI)

The survey results were analyzed by Most Efficient Influenced (MEI) households and non-Most Efficient Influenced (non-MEI) households to learn about potential demographic or attitudinal differences. This was done in order to understand the customer segment that would likely be influenced by the marketing designation regardless of whether they had been exposed to it or not. MEI households report having seen or heard of the ENERGY STAR label and the ENERGY STAR Most Efficient label, and report that they would be influenced by the Most Efficient label.²⁵ MEI households somewhat or strongly agree with the statement, “All other things equal, I would buy a product because it is designated ENERGY STAR Most Efficient.”

Demographics

Consistent with previous years, the 2015 demographic characteristics of MEI and non-MEI households were similar. However, the following significant differences were identified:

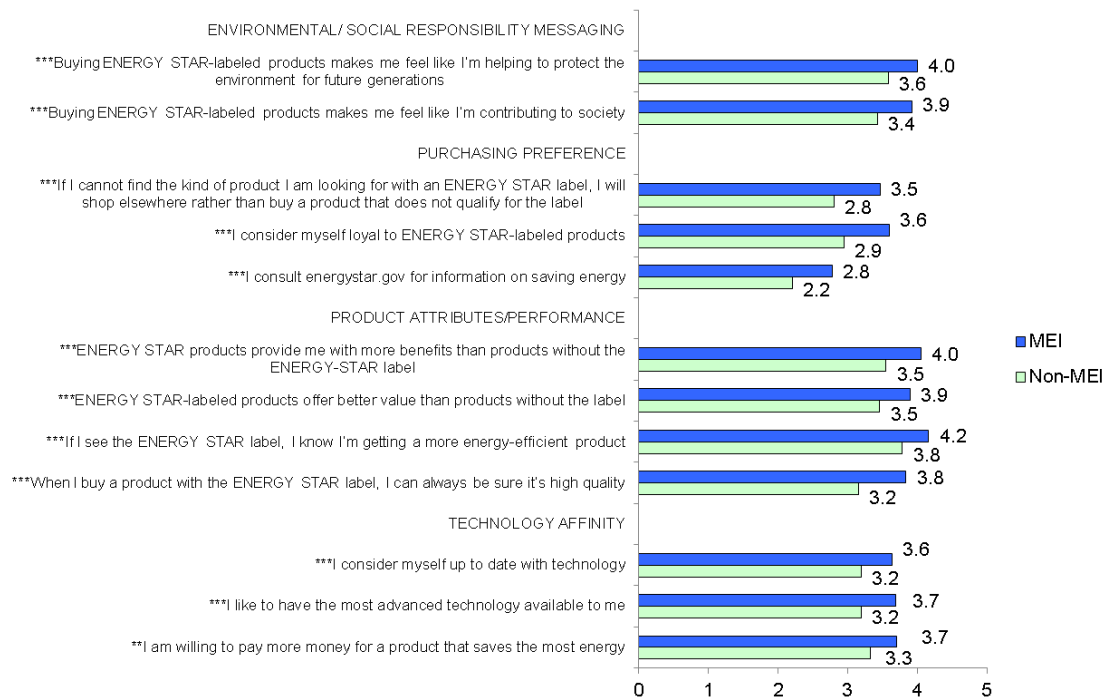
- A smaller proportion of MEI households (26 percent) than non-MEI households (46 percent) have a households pretax income of \$75,000 or more (p-value = 0.0016).
- A smaller proportion of MEI households (51 percent) than non-MEI households (69 percent) have living quarters owned by someone in the households (p-value = 0.0130).

²⁵ Most Efficient Influenced (MEI) households are those who are aware of the ENERGY STAR label; have indicated awareness of ENERGY STAR Most Efficient (unaided recognition, Q18. Have you ever seen or heard of ENERGY STAR Most Efficient?) and report they would buy a product because it is ENERGY STAR Most Efficient (somewhat or strongly agree with Q22. All other things equal, I would buy a product because it is designated as ENERGY STAR Most Efficient). All other respondents are non-MEI.

CONSUMER PERCEPTIONS

MEI households are very likely to associate ENERGY STAR with environmental and social benefits, are very likely to shop where they can find the ENERGY STAR label, perceive ENERGY STAR products to have superior performance, and are willing to pay more money for a product that saves the most energy. Consistent with previous years, MEI households had higher agreement than non-MEI households for all twelve positive attitudinal statements shown below. Furthermore, eleven of the positive statements in the table below are statistically significant at the 1 percent level ($p\text{-value} \leq 0.01$). The twelfth statement (I am willing to pay more money for a product that saves the most energy) is also statistically significant, but at the 5-percent level ($p\text{-value} = 0.0156$).

Response to Categorical Statements Regarding Messaging, Purchasing, and Product Attributes – Average Response Positive Statements (Base = Recognize label (aided))

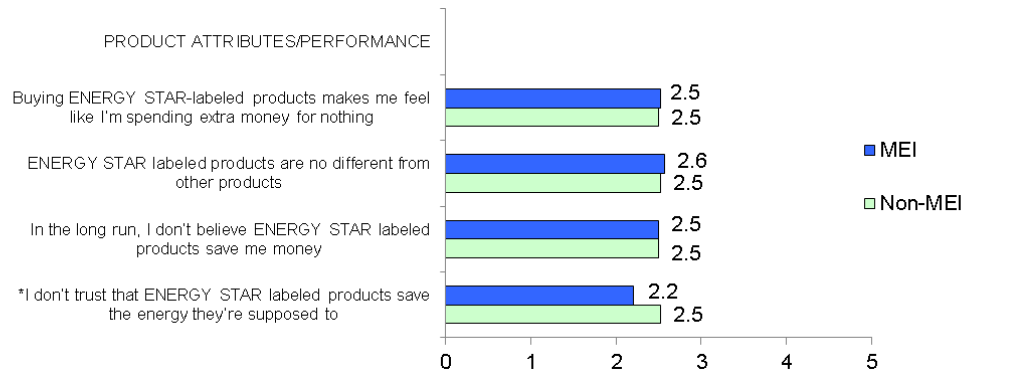


*** MEI and non-MEI averages are statistically different from each other at the 1-percent level of significance ($p\text{-value} \leq 0.01$).

** MEI and non-MEI averages are statistically different from each other at the 5-percent level of significance ($p\text{-value} \leq 0.05$).

MEI and non-MEI averages are statistically different for one of the negative statements. MEI respondents agree less with the statement, “I don’t trust that ENERGY STAR labeled products save the energy they’re supposed to” when compared to non-MEI respondents. This difference is significant at the 10-percent level (p-value = 0.0584).

**Response to Categorical Statements Regarding Messaging,
Purchasing, and Product Attributes – Average Response to Negative Statements
(Base = Recognize label (aided))**



* MEI and non-MEI averages are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

9. ENERGY STAR “CONNECTED” QUESTIONS

Consistent with 2014, this year questions were also included at the end of the survey to assess awareness and understanding of ENERGY STAR “Connected” products. ENERGY STAR “Connected” products contain a set of advanced energy saving features such as the following:

- Demand response (DR) status reporting (e.g., normal operation, delay appliance load, temporary appliance load reduction)
- Remote access to product
- Energy consumption reporting and feedback
- Peak period avoidance
- Smart grid capability
- Product connectivity.

ENERGY STAR and “Connected” Association

In 2015, survey respondents that recognized the ENERGY STAR label (aided) were asked “Have you ever heard the term ‘connected’ in relation to ENERGY STAR products” (survey question Q30). Nine percent of households that recognize the ENERGY STAR label have heard of the term “connected” in relation to ENERGY STAR products. This is a significant difference from 5 percent in 2014 at the 5-percent significance level (p -value = 0.0331). Results for recognition of ENERGY STAR “Connected” by publicity category are provided in the following table.

Association of ENERGY STAR and “Connected” by Publicity Category [Base = Recognize label (aided)]

| Publicity Category | Associated ENERGY STAR and “Connected” (n=36) |
|----------------------------------|---|
| High | 8.0% |
| Non-high | 9.1% |
| Difference (High minus Non-high) | 1.13% |
| p-value | 0.6867 |

Respondents that indicated they heard of the term “connected” in relation to ENERGY STAR products were asked “What does ENERGY STAR “Connected” mean to you?” (survey question Q31). Eleven of the 36 respondents were not able to articulate what ENERGY STAR “Connected” meant to them.²⁶ Of the remaining respondents, 11 provided responses relating to products capable of connecting to additional (smart) technology devices, such as phones, Bluetooth, or internet. Four answered describing products with additional energy efficiency/savings benefits, and 6 respondents reported a meaning that is related to the environment, money, or other response.

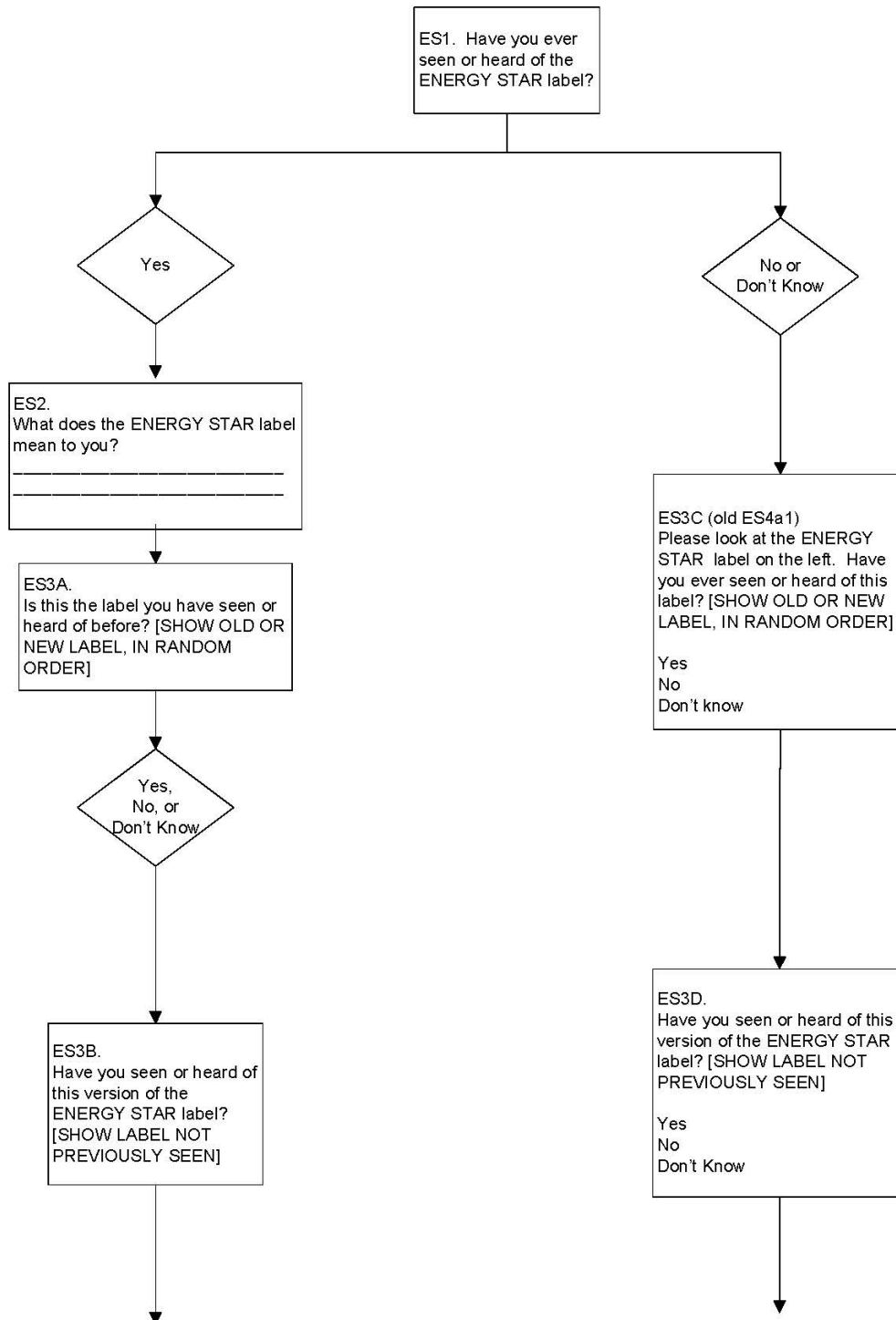
²⁶ Three respondents answered “Not sure”/“Not much” and one answered “Nothing.”

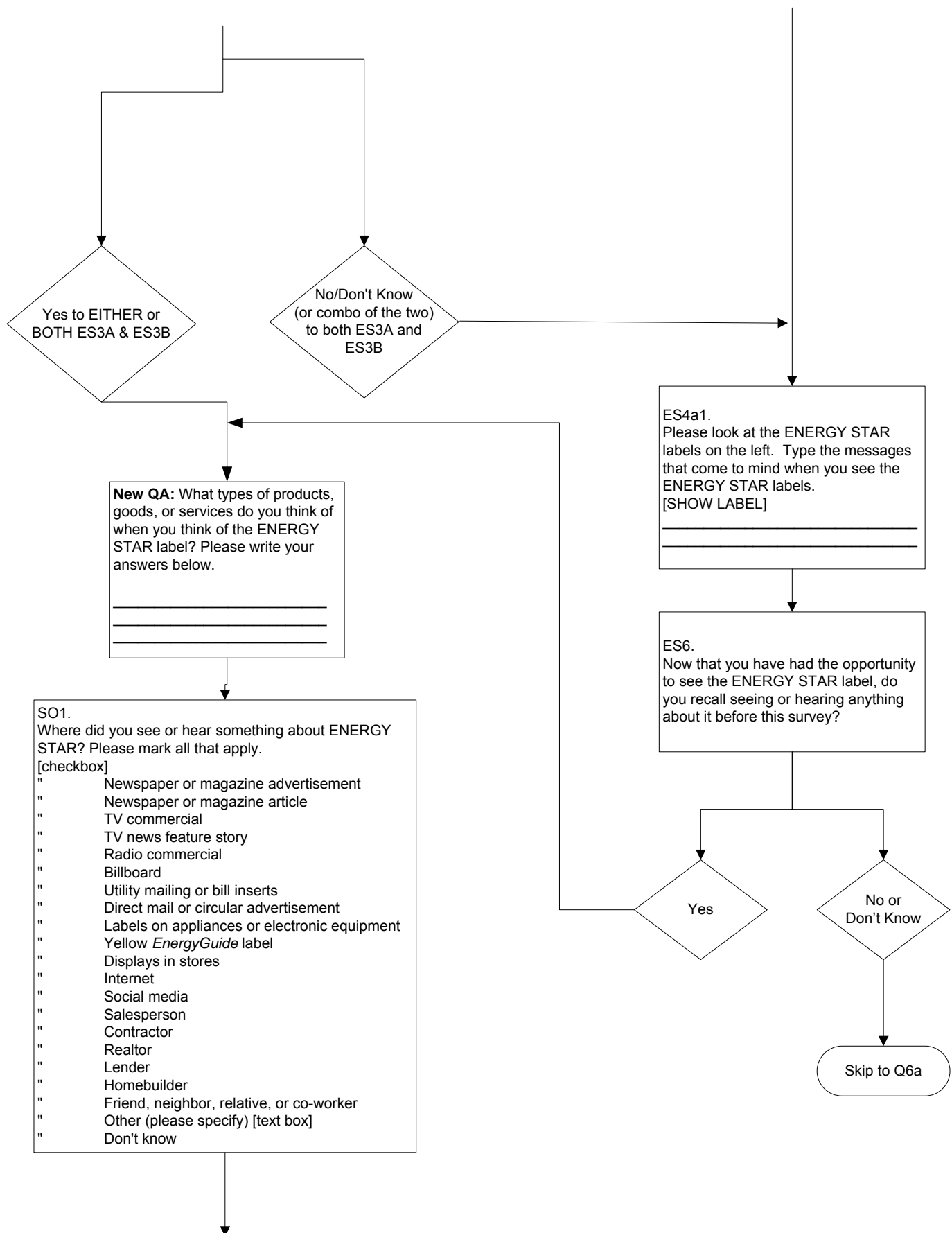
APPENDIX D: 2015 SURVEY QUESTIONS AND FLOW CHART

2015 ENERGY STAR SURVEY

September 11, 2015

Changes since 2014 highlighted in red.





SO2.
What did you see or hear about
ENERGY STAR? Please be
specific.

New QB: As far as you know, who decides
if a product deserves the ENERGY STAR
label? Select one answer only.

Product manufacturers
Retailers/stores
US Government
Underwriters Laboratories
Electric & gas utilities
Other: _____
Don't know

Q5(b). Please continue reviewing the lists of products below, and
select each of the products, product literature, or packaging on
which you have seen the ENERGY STAR label.

Home Appliances/Lighting

Dishwasher
Refrigerator
Lighting fixture
Washing machine
Light bulb
Microwave oven
Dehumidifier

None of these products

Home Electronics

Television
DVD product (including
TV/DVD)
Audio product

Q5(a). Now we're going to ask you about several groups of products.
As you review the list, please select each of the products, product
literature, or packaging on which you have seen the ENERGY STAR
label.

Heating and Cooling Products

Central air conditioner
Furnace or boiler
Heat pump
Thermostat
Room air conditioner
Water heater

None of these products

Home Office Equipment

Computer or monitor
Computer printer
Copying machine
Fax machine
Scanner
All-in-one printer
(includes copier/scanner/fax)

Q5(c). Finally, please review the last of the product lists below
and select each of the products, product literature, or packaging
on which you have seen the ENERGY STAR label.

Building Materials

Window
Door
Skylight
Insulation
Roofing material

Buildings

Newly built home

Q6a1

Have you or someone else in your household been shopping in a store in the last
12 months for any of the products listed below?

Heating and Cooling Products

Room air conditioner

Yes No Don't know

Home Appliances/Lighting

Dishwasher

Yes No Don't know

Refrigerator

Yes No Don't know

Lighting fixture

Yes No Don't know

Washing machine

Yes No Don't know

Light bulb

Yes No Don't know

Home Electronics

Television

Yes No Don't know

DVD product (including TV/DVD)

Yes No Don't know

Audio product

Yes No Don't know

Q6a2

Have you or someone else in your
household been shopping in a store in the
last 12 months for any of these other
products listed below?

Yes

No

Don't know

Heating and Cooling Products

Thermostat

Water heater

Home Office Equipment

Computer or monitor

Computer printer

Copying machine

Fax machine

Scanner

All-in-one printer

(includes copier/scanner/fax)

Home Appliances/Lighting

Microwave oven

Dehumidifier

Building Materials

Window

Door

Skylight

Insulation

Roofing material

Q6b

Have you or someone else in your household been shopping for a central air conditioner, furnace or boiler, heat pump, or newly built home in the last 12 months?

Yes
No
Don't know

For each product for which Yes was checked in the Q6a1 series, ask:

When you shopped for _____, did you look for the ENERGY STAR label?
Yes No Don't remember I did not shop for this product myself

When you shopped for _____, did you ask a salesperson for a product with the ENERGY STAR label?
Yes No Don't remember I did not shop for this product myself

a room air conditioner
a dishwasher
a refrigerator
a lighting fixture
a washing machine
light bulbs
a television
a DVD product
an audio product

Q12(a). Please look at each of the groups of products again. Which of these products have you purchased in the last 12 months? Please check all that apply.

Heating and Cooling Products

Central air conditioner
Furnace or boiler
Heat pump
Thermostat
Room air conditioner
Water heater

None of these products

Home Office Equipment

Computer or monitor
Computer printer
Copying machine
Fax machine
Scanner
All-in-one printer
(includes copier/scanner/fax)

Q12(b). Please continue reviewing the lists of products below. Which of these products have you purchased in the last 12 months? Please check all that apply.

Home Appliances/Lighting

Dishwasher
Refrigerator
Lighting fixture
Washing machine
Light bulb
Microwave oven
Dehumidifier

None of these products

Home Electronics

Television
DVD product (including
TV/DVD)
Audio Product

Q12(c). Finally, please review the last of the product lists below. Which of these products have you purchased in the last 12 months? Please check all that apply.

Building Materials

Window

Door

Skylight

Insulation

Roofing material

None of these products

Buildings

Newly built home

Did you install the light bulb(s) you purchased in a light fixture?

Yes

No

Don't know

No / Don't Know

Yes

What kind of bulb(s) did you purchase? Please indicate the primary type purchased:

- Compact fluorescent light bulb (CFL)
- Incandescent light bulb
- Halogen light bulb
- Light-emitting diode (LED)
- Don't know

What kind of bulb(s) did you replace? (Check the answer that best describes most of the replacements you made.)

- Compact fluorescent light bulb (CFL)
- Incandescent light bulb
- Halogen light bulb
- Light-emitting diode (LED)
- Don't know

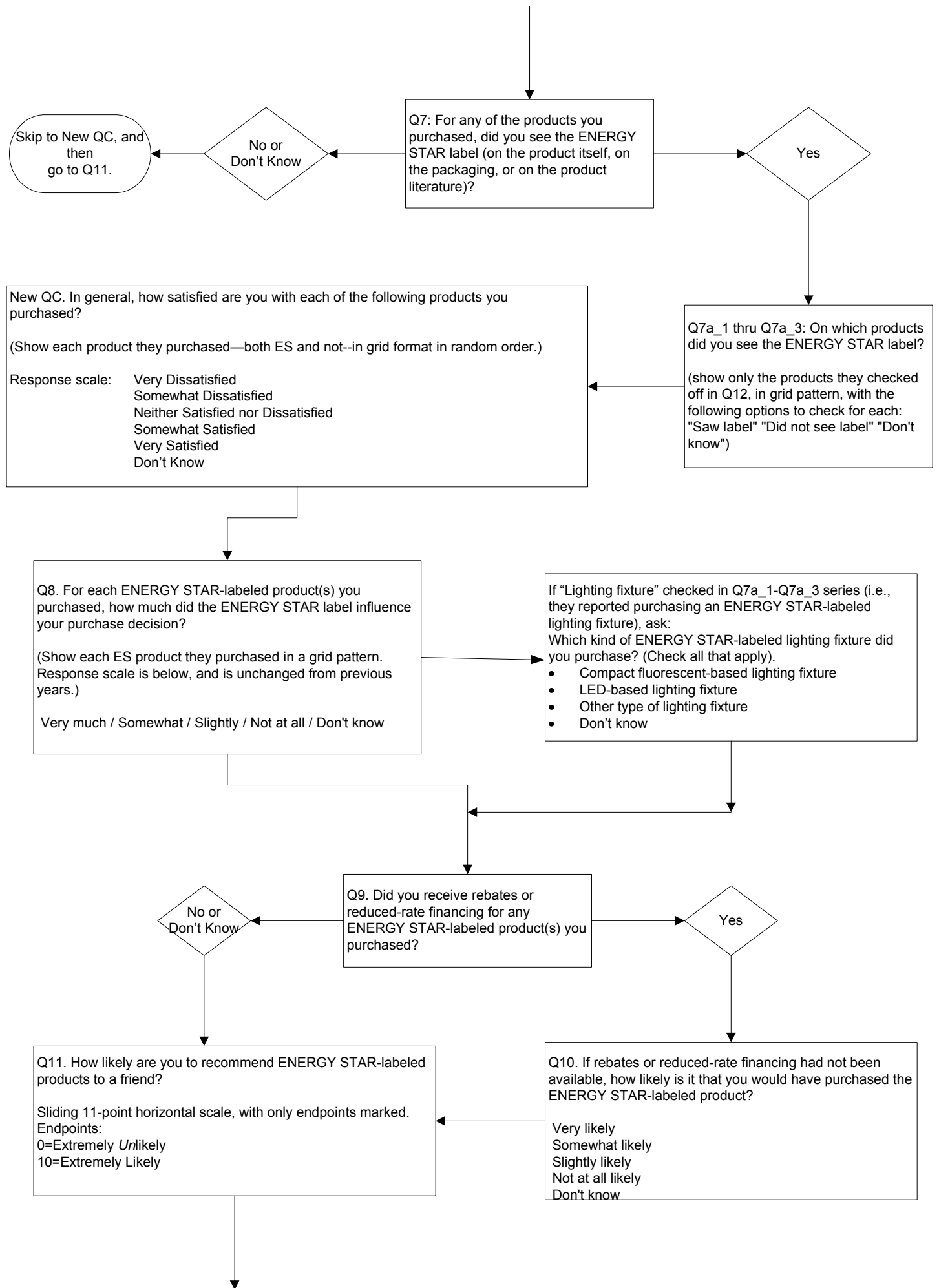
ES3A not=1 and
ES3B not=1 and
ES3C not=1 and
ES3D not=1 and
ES6 not=1

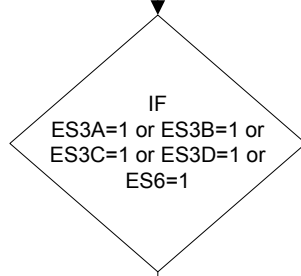
Go to Q16 series (pg 7)

No products
purchased

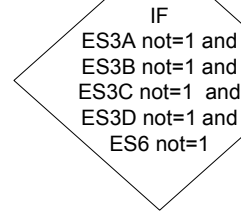
ES3A=1 or ES3B=1 or
ES3C=1 or ES3D=1 or
ES6=1

Any products
purchased





Note: These two
diamonds are
the same as
those before Q7.



Go to 17

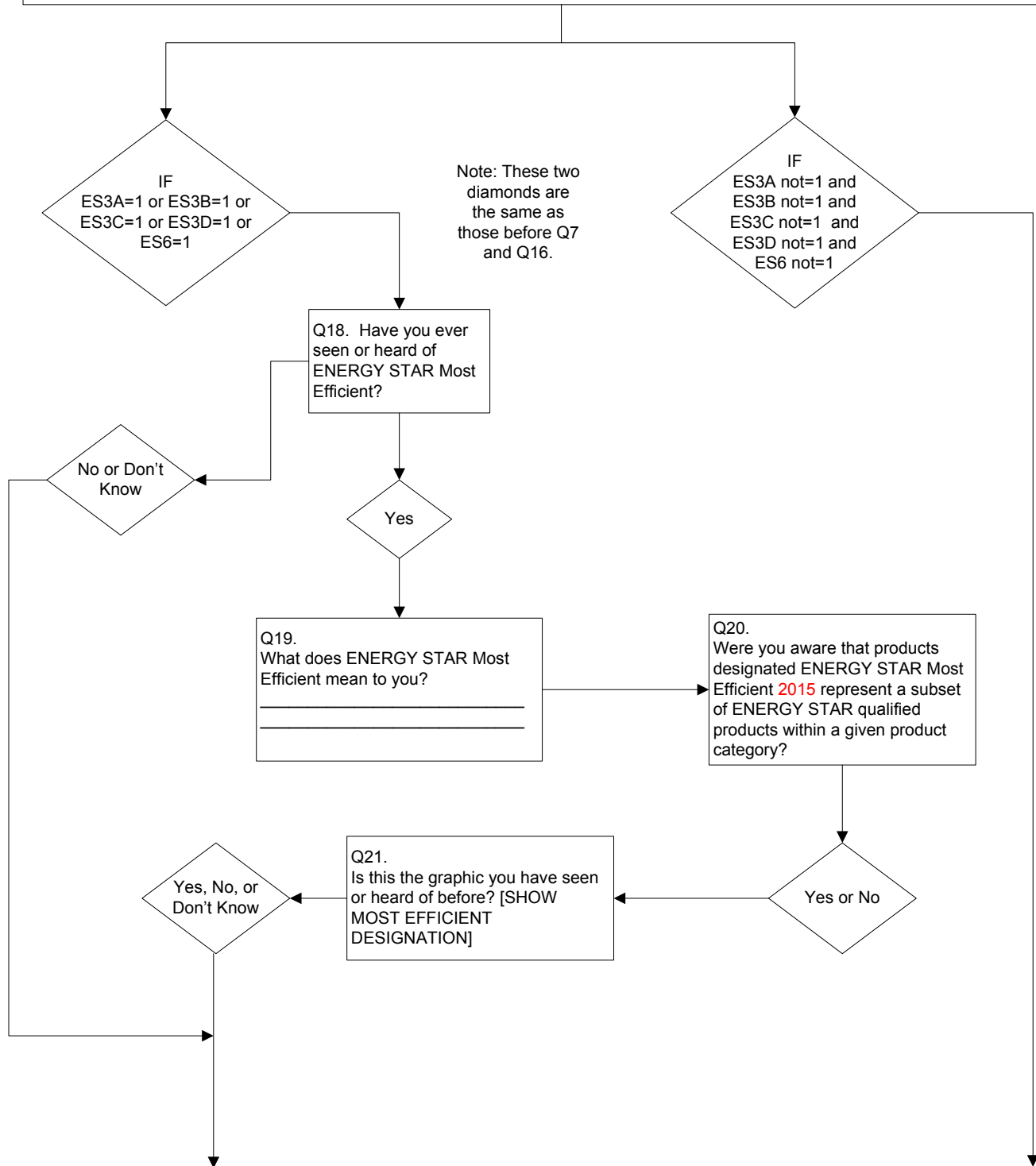
On the scale by each statement, please indicate how strongly you agree or disagree with the statement.

(Note to programmer: present Q16a through Q16s in random order for each respondent.)

| | Strongly Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Strongly Agree |
|---|----------------------|----------------------|----------------------------------|-------------------|-------------------|
| Q16a. ENERGY STAR-labeled products provide me with more benefits than products without the ENERGY STAR label. | 1 | 2 | 3 | 4 | 5 |
| Q16c. ENERGY STAR-labeled products offer better value than products without the label. | 1 | 2 | 3 | 4 | 5 |
| Q16d. If I cannot find the kind of product I am looking for with an ENERGY STAR label, I will shop elsewhere rather than buy a product that does not qualify for the label. | 1 | 2 | 3 | 4 | 5 |
| Q16f. Buying ENERGY STAR-labeled products makes me feel like I'm helping to protect the environment for future generations. | 1 | 2 | 3 | 4 | 5 |
| Q16h. Buying ENERGY STAR-labeled products makes me feel like I'm contributing to society. | 1 | 2 | 3 | 4 | 5 |
| Q16i. Buying ENERGY STAR-labeled products makes me feel like I'm spending extra money for nothing. | 1 | 2 | 3 | 4 | 5 |
| Q16l. I consider myself loyal to ENERGY STAR-labeled products. | 1 | 2 | 3 | 4 | 5 |
| Q16n. It seems like most products have the ENERGY STAR label these days. | 1 | 2 | 3 | 4 | 5 |
| Q16o. If I see the ENERGY STAR label, I know I'm getting a more energy-efficient product. | 1 | 2 | 3 | 4 | 5 |
| Q16p. When I buy a product with the ENERGY STAR label, I can always be sure it's high quality. | 1 | 2 | 3 | 4 | 5 |
| Q16q. ENERGY STAR-labeled products are no different from other products. | 1 | 2 | 3 | 4 | 5 |
| Q16r. In the long run, I don't believe ENERGY STAR-labeled products save me money. | 1 | 2 | 3 | 4 | 5 |
| Q16s. I don't trust that ENERGY STAR-labeled products save the energy they're supposed to. | 1 | 2 | 3 | 4 | 5 |
| Q16t. I am willing to pay more money for a product that saves the most energy. | 1 | 2 | 3 | 4 | 5 |
| Q16u. I like to have the most advanced technology available to me. | 1 | 2 | 3 | 4 | 5 |
| Q16v. I consider myself up to date with technology. | 1 | 2 | 3 | 4 | 5 |
| Q16w. I consult energystar.gov for information on saving energy. | 1 | 2 | 3 | 4 | 5 |

Q17. Please tell us about your role in your household's purchasing decisions. For each of the product groups listed below, do you usually make the purchasing decisions, do you share the decision-making equally with another household member, does someone else usually make the decisions but you have some input, or do you have no input in the decision-making?

| | I usually make the decisions | I share the decision-making equally | Someone else usually makes the decisions, but I have some input | I have no input in decision-making | I'm not sure |
|------------------------------|------------------------------|-------------------------------------|---|------------------------------------|--------------------------|
| Heating and Cooling Products | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Home Office Equipment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Home Appliances/Lighting | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Home Electronics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Building Materials | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



On the scale by the following statement, please indicate how strongly you agree or disagree with the statement.

Strongly
Disagree

Somewhat
Disagree

Neither
Agree nor
Disagree

Somewhat
Agree

Strongly
Agree

Q22. All other things equal, I would buy a product because it is designated as ENERGY STAR Most Efficient.

1

2

3

4

5

