



National Awareness of ENERGY STAR® for 2019

Analysis of CEE Household Survey

ENERGY STAR®. The simple choice for energy efficiency.

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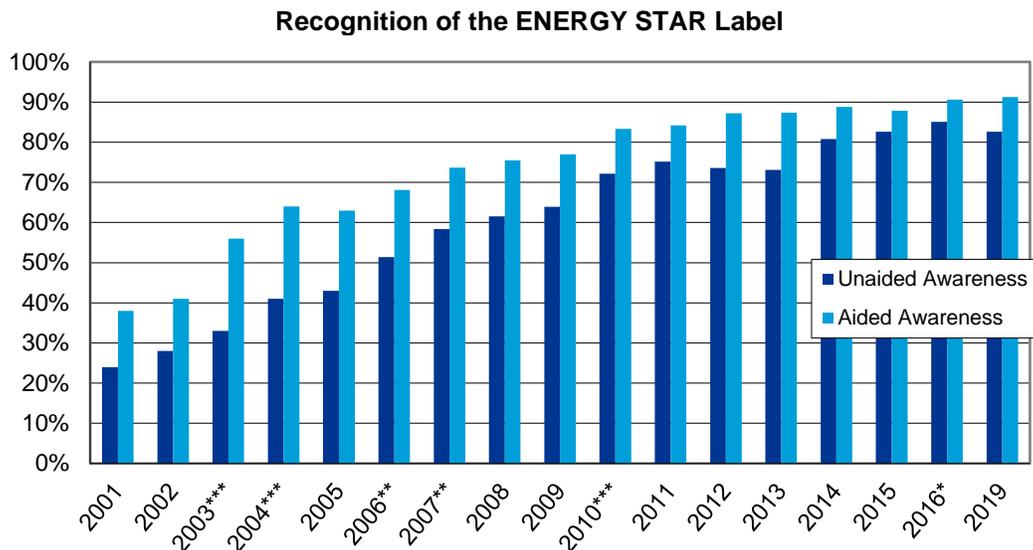
EXECUTIVE SUMMARY

In the fall of 2019, members of the Consortium for Energy Efficiency (CEE) sponsored the eighteenth national household survey of consumer awareness of ENERGY STAR. Since 2000, 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 2019 ENERGY STAR Household Survey at the national level, compares findings with the previous survey (2016), and focuses 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 purchasing decisions.

Key Findings at the National Level

- Households continue to show high levels of **recognition** of the ENERGY STAR label. Ninety-one percent of households recognize ENERGY STAR when shown the label. Eighty-three percent of households reported seeing or hearing about ENERGY STAR prior to being shown the label. These findings are similar to the 2016 survey findings. Trends in awareness over time are shown in the chart below.



Note: Respondent awareness was classified into (label) aided and unaided awareness of ENERGY STAR. The asterisks indicate significant difference in *aided* awareness at the one, five, and ten percent level. In addition, there were statistical differences in *unaided* awareness in the following study years: 2002, 2004, 2006, 2007, 2010 and 2014. Proportions were statistically different from the prior year findings at the 5 percent level or greater.

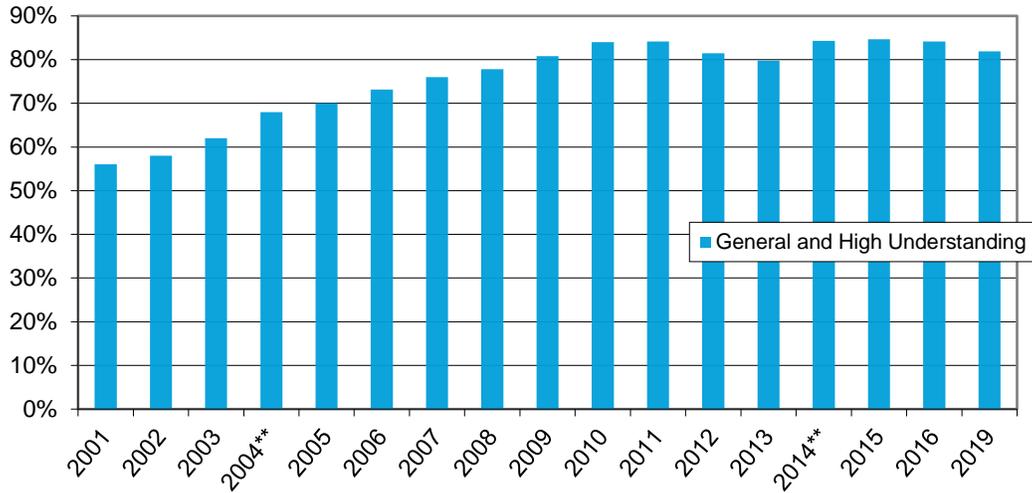
*** Proportions between study year and prior year are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01).

** Proportions between study year and prior year are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

* Proportions between study year and prior year are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

- Households continue to show a high **understanding** of the ENERGY STAR label. Seventy-four percent of households had a high understanding of the ENERGY STAR label in 2019. Eighty-two percent of households had at least a general understanding of the label in 2019. These findings are similar to the prior survey findings (2016). Trends in understanding over time are shown in the chart below.

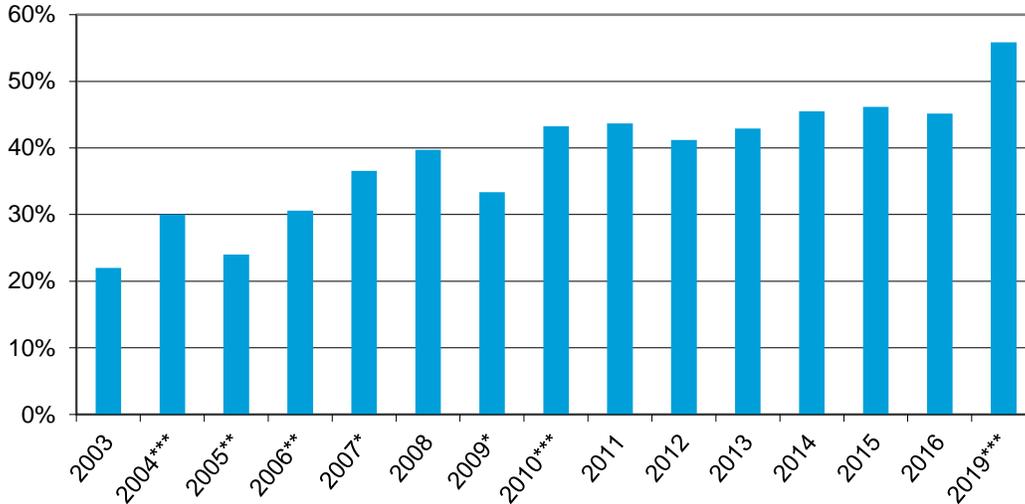
Understanding of the ENERGY STAR Label



- *** Proportions between study year and prior year are statistically different from each other at the 1-percent level of significance ($p\text{-value} \leq 0.01$).
- ** Proportions between study year and prior year are statistically different from each other at the 5-percent level of significance ($p\text{-value} \leq 0.05$).
- * Proportions between study year and prior year are statistically different from each other at the 10-percent level of significance ($p\text{-value} \leq 0.10$).

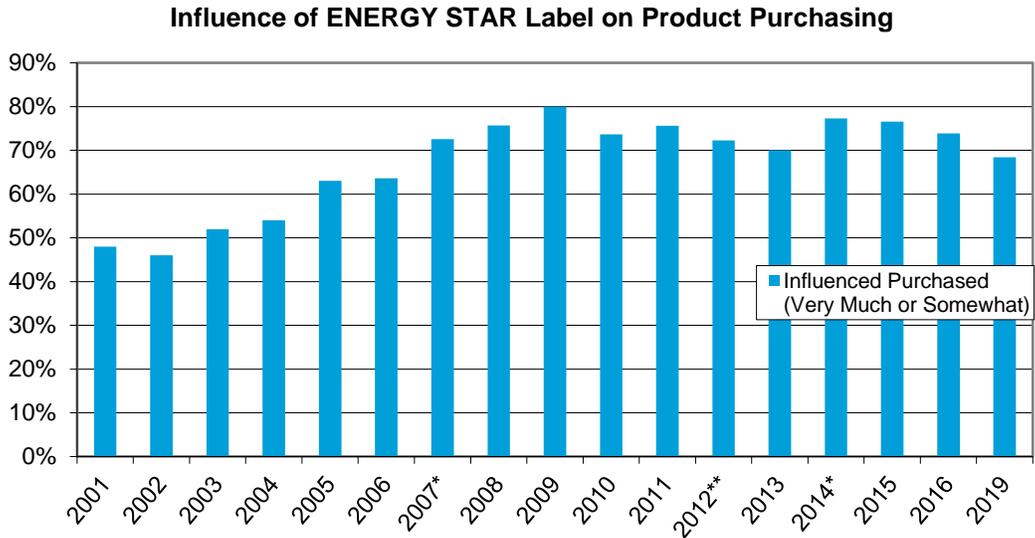
- Among all households, 56 percent report **knowingly purchasing** an ENERGY STAR-labeled product in the past 12 months. This metric is calculated based on recognition of the label, purchase of a product in the last 12 months, and whether the ENERGY STAR label was seen on a purchased product. This finding is a statistical increase from the prior survey findings (2016). Trends in ENERGY STAR purchasing over time are shown in the chart below.

Knowingly Purchased an ENERGY STAR Product



- *** Proportions between study year and prior year are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01).
- ** Proportions between study year and prior year are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).
- * Proportions between study year and prior year are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

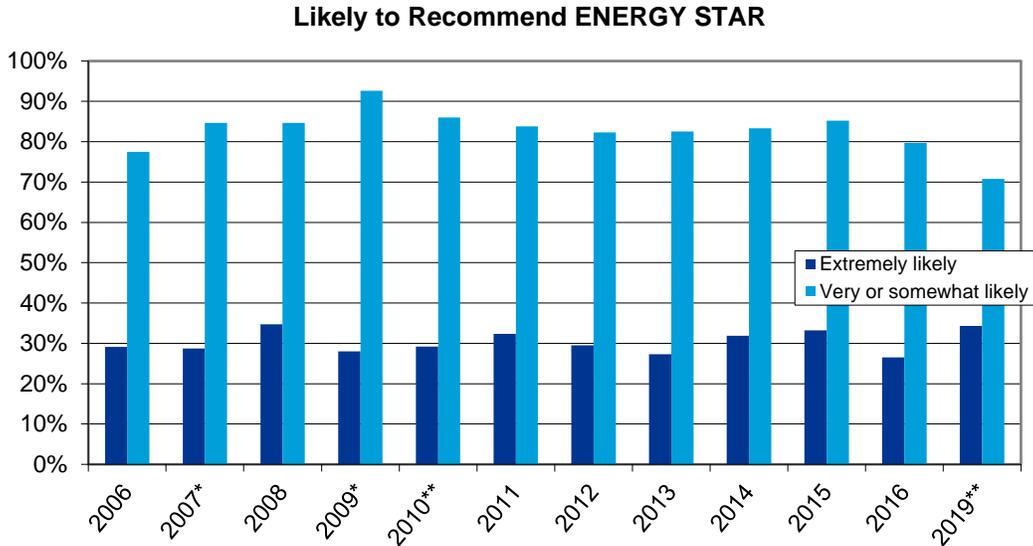
- The ENERGY STAR label continues to be **influential** in household purchasing. Sixty-eight percent of knowing purchasers reported ENERGY STAR was very much or somewhat influential in their purchasing decision. This finding is similar to the prior survey findings. Trends in ENERGY STAR influence over time are shown in the chart below.



** Proportions between study year and prior year are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

* Proportions between study year and prior year are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

- Of those who knowingly purchased an ENERGY STAR product in the past 12 months, 34 percent of households report they would be extremely likely to recommend ENERGY STAR products to a friend (answering 10 on a 0 to 10-point scale with 0 being extremely unlikely and 10 being extremely likely). This proportion is statistically greater than the value in 2016. The likelihood of recommending ENERGY STAR products to a friend is greater than “5” (very or somewhat likely) for 71 percent of all surveyed households. This is statistically lower than the prior survey result of 80 percent. Trends in ENERGY STAR **loyalty** are shown in the chart below.



** Aggregate proportions of very or somewhat likely (all answers greater than “5”) between study year and prior year are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

* Aggregate proportions of very or somewhat likely (all answers greater than “5”) between study year and prior year are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

Conclusions

This eighteenth national study of household awareness of the ENERGY STAR label confirms key findings from the previous surveys. Substantial portions of U.S. households recognize, understand, knowingly purchase, and are influenced by the ENERGY STAR label when purchasing energy using products.

INTRODUCTION

In the fall of 2019, members of the Consortium for Energy Efficiency (CEE) sponsored the eighteenth national household survey of consumer awareness of ENERGY STAR. Each year that the survey has been undertaken, 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 2019 ENERGY STAR Household Survey, compares findings with the previous survey (2016), and focuses on the extent to which consumers recognize the ENERGY STAR label, understand its intent, and utilize or are influenced by the label in their energy-related purchasing decisions.

Over the years, the CEE evaluation committee has recommended and implemented changes to survey instrument to add new research questions of interest or to eliminate questions that are no longer useful. Importantly, all changes to the survey instrument have been made with the goal of ensuring the ability to compare data over time for key ENERGY STAR indicators. This year, CEE made more substantial changes to the survey instrument, details of which can be found in Appendix A. Some of the more significant changes include the following:

- **Removal of publicity category stratification and analysis:** As programs leveraging ENERGY STAR became ubiquitous throughout the country, the publicity categorization became less meaningful, and publicity categories were frozen in 2009. This year, CEE removed the publicity categorization as a component in the sample stratification.
- **Removal of the “old” label from recognition sequence:** In 2002, EPA changed the ENERGY STAR label and CEE’s evaluation committee suggested showing both labels to assess aided or visual awareness of ENERGY STAR. This year, CEE eliminated showing of the old mark given that there has been more than ample time for market transition.
- **Updated technology lists:** As new technologies are developed and old technologies become obsolete, there are changes in the products that bear the ENERGY STAR label. To reflect the current marketplace, CEE added, removed, and consolidated a substantial number of products asked about in the survey.

The remainder of this report summarizes the survey and analysis methodology; it provides key findings regarding ENERGY STAR label recognition, understanding, and influence. It also contains appendices presenting detailed survey methodology (Appendix A), demographic information (Appendix B), survey history (Appendix C), and a copy of the 2019 questionnaire (Appendix D). In all cases, the results presented in this report are weighted to represent the national level and facilitate comparisons with prior years’ results. (Please refer to Appendix A for details on the weighting methodology).

METHODOLOGY OVERVIEW

In late November 2019, CEE fielded a questionnaire to obtain information at the national level on consumer awareness of the ENERGY STAR label, using a random sample of households that are members of an Internet panel. Both the panel as a whole and the sample of households completing the survey were selected by address-based sampling (ABS) and recruited through a series of mailings.¹ The panel is designed to be representative of the U.S. population. (Please refer to Appendix A for a more detailed description of the survey methodology).

The sampling frame for the national analysis 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 the past, CEE stratified the sample into publicity categories in order to assess the impact of local energy efficiency program publicity on key ENERGY STAR indicators. As programs leveraging ENERGY STAR became ubiquitous throughout the country, this categorization became less meaningful, and publicity categories were frozen in 2009. This year, CEE eliminated the publicity categorization and replaced it with sample stratification of the largest 57 DMAs by number of households—the largest third, the middle third, and the smallest third. The sample stratification was used to ensure coverage of the population across larger and smaller DMAs. The number of respondents in each stratum was chosen in proportion to that stratum's share of households in the largest 57 DMAs. In 2019, the national sample comprises 1,240 respondents from the largest 57 DMAs.²

CEE members may choose to sponsor more intensive sampling (i.e., an oversample) in selected localities, referred to here as *sponsor areas*. Sponsor areas are not limited to the 57 largest DMAs, however, to facilitate comparisons across years, each year the national results are based only on data collected from respondents from the 57 largest DMAs. Some of the 57 largest DMAs are also included in the sponsor areas and therefore are oversampled. The data from these respondents (as well as from the other respondents in the 57 largest DMAs) receive an appropriate weight in the analysis in order to generate valid national results and facilitate comparison with data from other years. In 2019, there was one sponsor area:

- The New York State Research and Development Authority (NYSERDA) chose to fund additional sampling in New York.

The CEE members who fund the oversample for a sponsor area determine the total number of sampling points allocated to the sponsor area. The New York State oversample is stratified by Upstate versus Downstate, and largest 57 DMAs versus non-large 57 DMAs. The New York State oversample from the largest 57 DMAs are

¹ Prior to 2009, the panel was recruited via random-digit dial. Ipsos, the survey vendor, believes that ABS improves population coverage and provides a more effective means for recruiting hard-to-reach individuals, such as young adults and minorities.

² In 2019, there were 28 respondents beyond the sample target of 1,000 and an additional 212 respondents that were part of the oversample.

appropriately weighted and included in the national analysis.

In this report, the following terminology is used in comparing results across years or sub-categories:

- *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.
- 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.
- *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 2019, 91 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 also 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 more conservative.

Recognition results for both the 2019 and 2016 surveys are summarized in the following table. Aided recognition of the ENERGY STAR label was unchanged compared to 2016. Unaided recognition of the ENERGY STAR label was also similar (p-value = 0.1824).

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

Recognize ENERGY STAR Label	2019		2016	
	Aided (n=1,213)	Unaided (n=1,176)	Aided (n=1,043)	Unaided (n=1,007)
Yes	91%	83%	91%	85%
Standard error	0.9%	1.3%	1.0%	1.3%

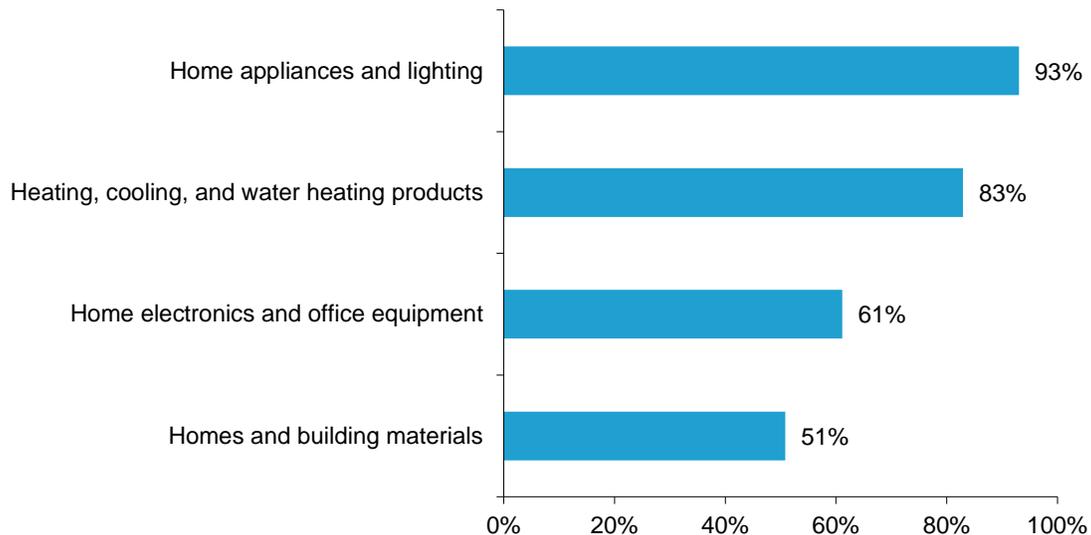
Note: The unaided recognition results for both years were based on the question ES1: "Have you ever seen or heard of the ENERGY STAR label?" The aided recognition results for 2019 were based on three questions: (1) ES3A: "Is this the label you have seen or heard of before?"; (2) ES3C: "Please look at the ENERGY STAR label below. Have you ever seen or heard of this label?"; and Q2: "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?" In prior surveys, the results were based on showing two versions of the label, an older version of the label (in use prior to 2002) and the current version of the label.

Product Association

Households that recognized the ENERGY STAR label (aided) were asked to select from a list of products, each product where they had seen the ENERGY STAR label on the product, product literature, or packaging.

In 2019, product groupings were consolidated; each product was classified into one of four product categories. Product association by product category measures the proportion of respondents who associated at least one product from that product category with the ENERGY STAR label. As demonstrated in the chart below, all product categories had strong association with the ENERGY STAR label. The “home appliances and lighting,” and “heating, cooling, and water heating products” categories had the highest levels, at 93 percent and 83 percent product association, respectively.

Product Association with the ENERGY STAR Label by 2019 Product Category
[Base = Recognize label (aided)³]



³ Respondents were asked about four sets of product groupings: (1) Heating, Cooling, and Water Heating Products; (2) Home Electronics and Office Equipment; (3) Home Appliances and Lighting; and (4) Homes and Building Materials. The sample size (n) for these product groupings are 1060, 952, 1085, and 867, respectively.

It is important to note that this year's survey underwent a more substantive update than years past and these changes may have had an impact on results. Details of the 2019 survey changes (including the removal of an unprompted product association question⁴ and updates to the product list necessary to account for changes in the marketplace) can be found in Appendix A.

The following two figures show product associations of products that appeared on the 2019 ENERGY STAR survey, and products that were common to both the 2019 and 2016 surveys, respectively.

As demonstrated in the first chart below, in 2019, home appliances showed the strongest levels of product association with the ENERGY STAR label. Households that recognized the ENERGY STAR label reported seeing the label on the product, product literature or packaging of "Refrigerators" (80 percent), "Clothes washers" (72 percent), "Clothes dryers" (70 percent), and "Dishwashers" (62 percent). For products that were newly added to the list, there was a fair amount of variance in product association with the ENERGY STAR label. Clothes dryers, which at 70 percent showed the highest level of association for a new product, became eligible to receive the ENERGY STAR certification in 2015.⁵ (Respondents had previously associated clothes dryers with the ENERGY STAR label before they were eligible for certification). Other newly added products showed lower levels of association, with "Air purifier" as the next highest at 13 percent.

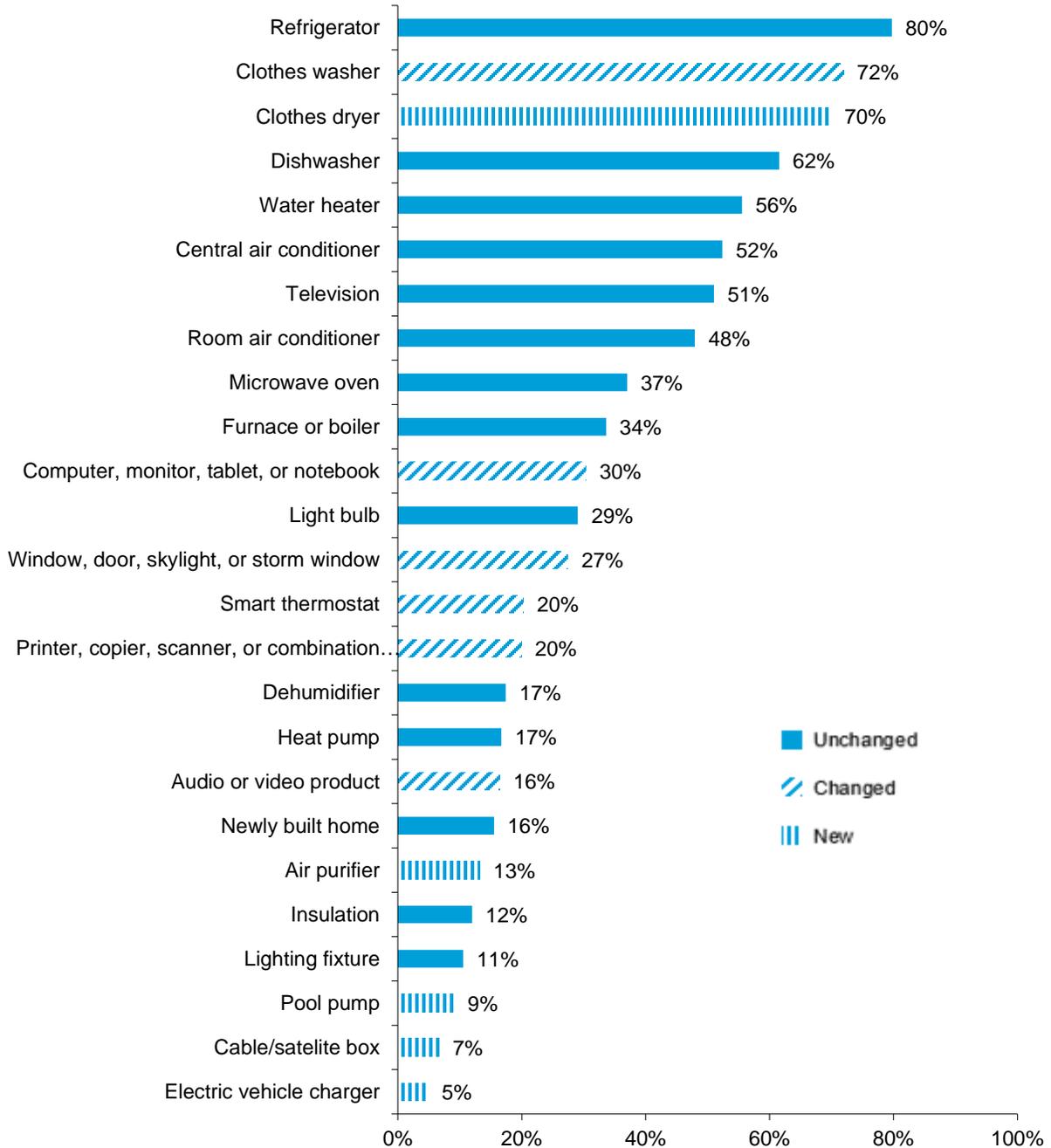
As shown on the second chart, product associations decreased for 9 out of 15 products⁶ that appeared on both the 2019 and 2016 ENERGY STAR surveys. While there continues to be a high level of association between the ENERGY STAR label and products that have been historically supported by regional energy efficiency programs, such as refrigerators, clothes washers, and dishwashers, the decreases for these products are noteworthy.

⁴ In prior surveys the product association question followed unprompted question QA, "What types of products, goods, or services do you think of when you think of the ENERGY STAR label?" This question was removed from the 2019 survey so for purposes of this report all references to "product associations" are classified as "prompted product associations."

⁵ The clothes dryer specification went into effect in January 2015.

⁶ To allow for cross-year comparison the table excludes any products that were newly added to the 2019 survey or removed since the 2016 survey. Products that were changed are indicated with diagonal stripes and are not considered statistically comparable between years (except for "Clothes washer" changed from "Washing machine"). For more details on product list updates, see Appendix A, page A-5.

Product Association with the ENERGY STAR Label for Products on the 2019 Survey⁷
[Base = Recognize label (aided)⁸]

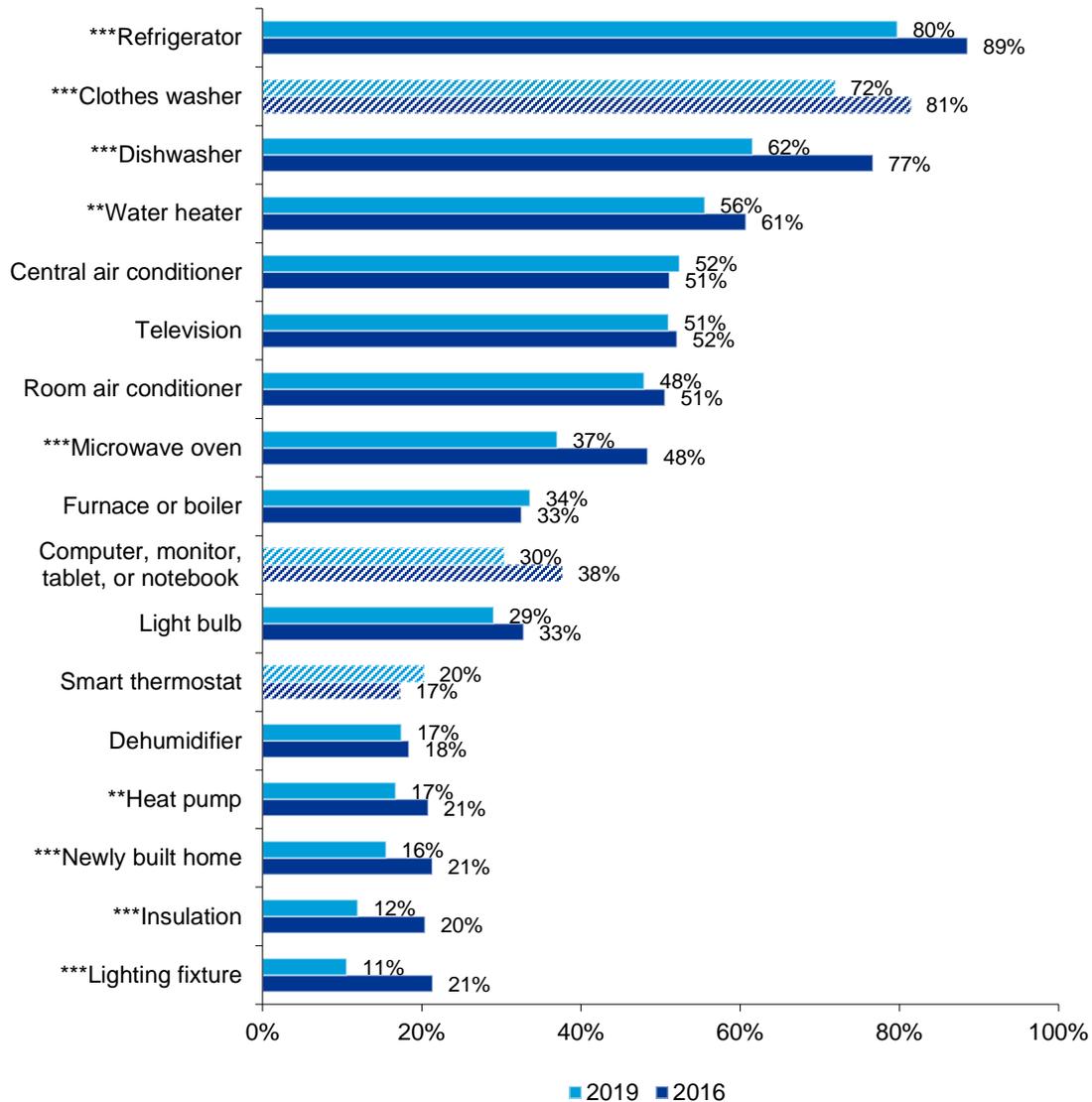


Note: Q5 (a and b): “Now we’re going to ask you about several groups of products. As you review the list, please select each of the products, product literature, or packaging on which you have seen the ENERGY STAR label.”

⁷ The table reflects all products that were included on the 2019 survey, including those that were newly added (vertical stripes) or changed (diagonal stripes) since the 2016 survey. For more details on product list updates see Appendix A, page A-5.

⁸ Respondents were asked about four sets of product groupings: (1) Heating, Cooling, and Water Heating Products, (2) Home Electronics and Office Equipment, (3) Home Appliances and Lighting, and (4) Homes and Building Materials. The sample size (n) for these product groupings are 1060, 952, 1085, and 867, respectively.

**Product Association with the ENERGY STAR Label⁹
[Base = Recognize label (aided)¹⁰]**



Note: Q5 (a and b): “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.”

*** 2019 and 2016 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01).

** 2019 and 2016 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

⁹ To allow for cross-year comparison, the table excludes product categories that were added to the 2019 survey or removed since the 2016 survey. Products that were changed are indicated with diagonal stripes and are not considered statistically comparable between years (except for “Clothes washer” changed from “Washing machine”). For more details on product list updates, see Appendix A, page A-5.

¹⁰ Respondents were asked about four sets of product groupings: (1) Heating, Cooling, and Water Heating Products; (2) Home Electronics and Office Equipment; (3) Home Appliances and Lighting; and (4) Homes and Building Materials. The sample sizes (n) for these product groupings were 1060, 952, 1085, and 867, respectively.

UNDERSTANDING

In 2019, 82 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 (8 percent) was small compared with the proportion that exhibited a high understanding (74 percent). The level of understanding was investigated by asking all respondents what messages came to mind when they saw the ENERGY STAR label, regardless of whether they recognized the label. Based on the reported messages, a respondent's understanding was classified as *high*, *general*, or *no understanding*.

The 2019 and 2016 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 was similar between 2016 and 2019, 75 percent and 74 percent, respectively (p-value = 0.3113). In addition, the proportion of respondents with at least a general understanding of the label is consistent from 2016 to 2019, 84 percent and 82 percent, respectively (p-value = 0.2055).

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

Level of Understanding of the Label	2019 (n=1,240)	2016 (n=1,075)
High understanding	74%	75%
General understanding	8%	9%
No understanding	18%	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) Q1: "Please look at the ENERGY STAR label below. Type the messages that come to mind when you see the ENERGY STAR label."

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 and its partners communicate key messages about the label and through the label itself. These responses are used in the analysis of understanding in the previous section. Overall, there was an increase in energy-related responses and a decrease in environment-related responses.

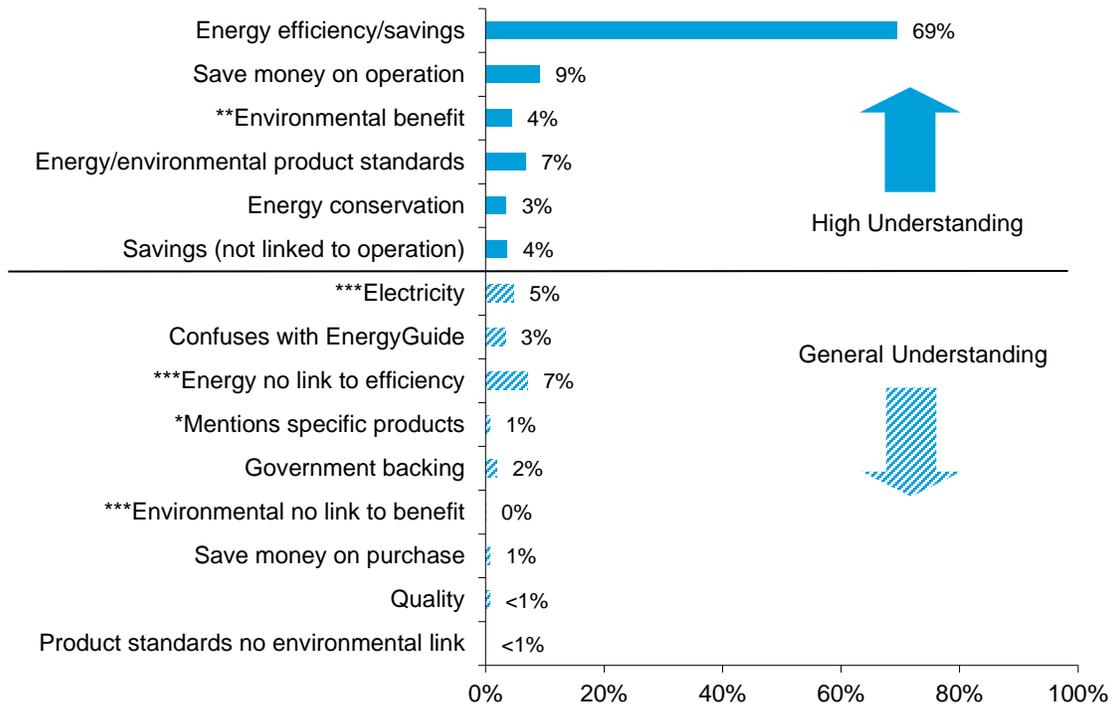
By far, the most common messages associated with the label were “energy efficiency or energy savings,” which is considered high understanding of the label. Sixty-nine percent of households surveyed associated the ENERGY STAR label with this message. This is consistent with the 2016 result of 70 percent (p-value = 0.7557).

There was also an increase at the 1-percent level (p-value = 0.0008) in the percentage of households that associated the ENERGY STAR label with “energy no link to efficiency,” which is considered general understanding of the ENERGY STAR label.

There was a decrease in the percent of households that mentioned “environmental benefit,” which is also categorized as high understanding of the ENERGY STAR label. “Environmental benefit” decreased from 7 percent of households to 4 percent of households, which is significantly different at the 5-percent level (p-value = 0.0127). Similarly, there was a decrease in responses categorized as “environmental no link to benefit,” considered general understanding of the label, which was statistically significant at the 1-percent level (p-value = 0.0014).

Between 2016 and 2019, there were also decreases in the percentages of households that associated the ENERGY STAR label with “Electricity”, and “Mentions specific products.” Responses related to “Electricity” were statistically different from 2016 at the 1-percent level (p-value = 0.0015). Responses categorized as “Mentions specific products” were statistically different from 2016 at the 10-percent level (p-value = 0.0920).

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



*** 2019 and 2016 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01). The proportion of households in 2019 is smaller than 2016 for “Environmental no link to benefit” and “Electricity,” and larger than 2016 for “Energy no link to efficiency”.

** 2019 and 2016 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05). The proportion of households in 2019 is smaller than 2016 for “Environmental benefit”.

* 2019 and 2016 proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10). The proportion of households in 2019 is smaller than 2016 for “Mentions specific product.”

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 2019, 87 percent of households that recognized the ENERGY STAR label had at least a general understanding of it; in households that did not recognize the label, 36 percent had at least a general understanding of it. The 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 recognized the label and had at least a general understanding of the label in 2019 (87 percent) is not statistically different from the 2016 result (89 percent) at the 10-percent level (p -value = 0.2088). Among households that did not recognize the label when shown it, the proportion that had at least a general understanding of the label in 2019 (36 percent) is different from the 2016 result (49 percent) at the 10-percent level (p -value = 0.0945).

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

Recognize ENERGY STAR Label Aided	At Least General Understanding of Label	
	2019	2016
Yes	87%	89%
No	36%	49%
Difference (Yes minus No)	51%	41%
p-value	<0.0001	<0.0001

The proportion of households that recognized the label and had a high understanding of the label in 2019 (80 percent) is not statistically different from the 2016 result (82 percent) at the 10-percent level (p -value = 0.2911). However, among households that did not recognize the label, there was a decrease in the proportion that had a high understanding of the label at the 5-percent level (p -value = 0.0356).

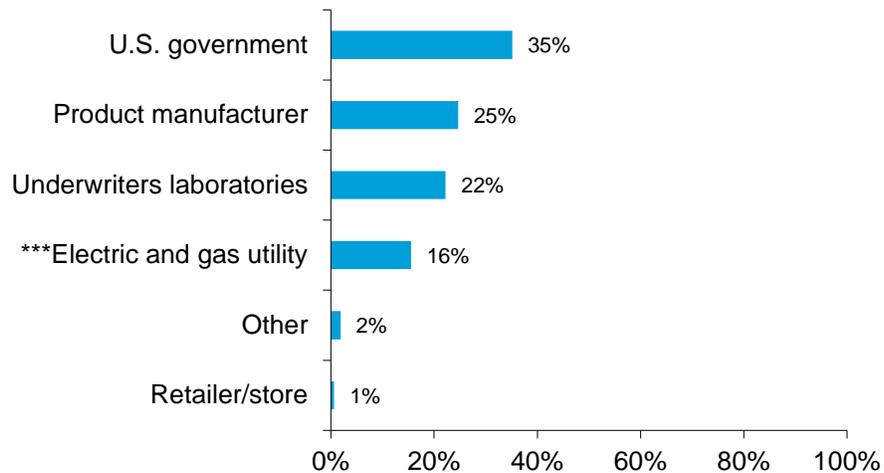
High Understanding of the ENERGY STAR Label by Aided Recognition
[Base = All respondents]

Recognize ENERGY STAR Label Aided	High Understanding of Label	
	2019	2016
Yes	80%	82%
No	13%	26%
Difference (Yes minus No)	67%	57%
p-value	<0.0001	<0.0001

ENERGY STAR Designation

Thirty-five 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 is similar to the 2016 result of 39 percent. Sixteen percent of respondents thought that either an electric or gas utility made this designation; this is higher than 2016 (9 percent) at the 1-percent level (p-value = 0.0033).

**Designates ENERGY STAR-Labeled Product
(Base = Recognize label (aided), n=709)**



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

*** 2019 and 2016 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01). The proportion of households in 2019 is larger than 2016 for "Electric and gas utility".

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;
- Of the households that recognized the label (aided) and purchased a product, the proportion that knowingly purchased at least one ENERGY STAR-labeled product.

For the first proportion, the percent of households that recognized the ENERGY STAR label when shown the label (i.e., *aided recognition*) in 2019 (91 percent) was consistent with 2016 (91 percent). For the other two proportions, the results for 2019 increased compared to 2016 at the 1-percent level of significance.

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

	Aided Recognition (2016 n=1,043) (2019 n=1,213)	Purchased Product (2016 n=944) (2019 n=1,105)	Knowingly Purchased ENERGY STAR product (2016 n=471) (2019 n=590¹¹)
2019	91%	75%	82%
2016	91%	67%	74%
Difference	0.7%	7.3%	8.0%
p-value	0.619	0.002	0.005

Overall, an estimated 56 percent of all households knowingly purchased an ENERGY STAR product in the past 12 months. This is different from the 2016 result (45 percent) at the 1-percent level (p-value=0.0009). This increase is driven by an increase in products purchased and an increase in knowing purchase of an ENERGY STAR product.

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

Purchased ENERGY STAR product	2019 (n=1,213)	2016 (n=1,043)
Estimate (yes)	56%	45%
Standard Error	2.2%	2.3%

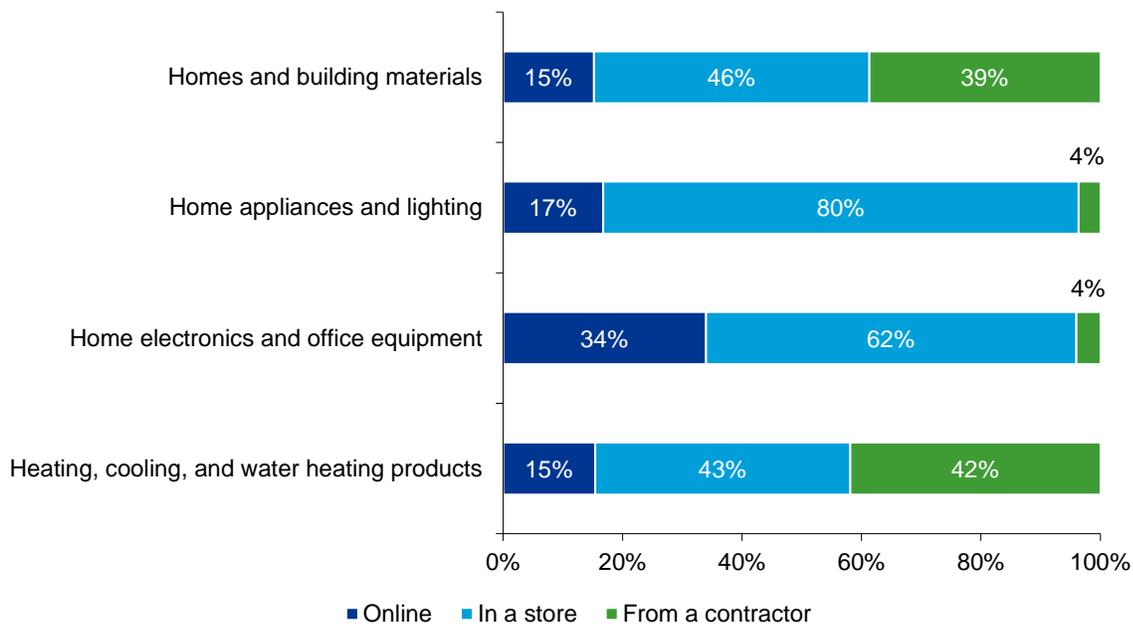
¹¹ This includes 1 respondent that indicated they purchased an “ENERGY STAR microwave oven” even though there is no ENERGY STAR designation for microwave ovens.

Purchasing Channels

In 2019, a question was added to the survey to investigate purchasing channels.¹² Respondents that purchased a product were asked for each product they purchased whether it was purchased “Online,” “In a store,” or “From a contractor.”

Across all respondents who purchased a product in the past 12 months, 66 percent purchased the product in a store, 22 percent purchased the product online, and 12 percent purchased the product from a contractor. Purchasing channels varied by product group. Eighty percent of purchasers of “Home Appliances and Lighting” reported purchasing in a store, as did 62 percent of “Home Electronics and Office Equipment” purchasers. “Home Electronics and Office Equipment” were purchased online at a higher proportion than other product categories.

Product Purchasing Channel by Product Category
[Base = Purchased Product in last 12 months¹³]



Note: Q12f: “For each product selected (in Q12), how did you purchase the product?”

¹² The ENERGY STAR Product Purchasing Source question, Q12f, is shown in Appendix D, page D-2.

¹³ Respondents were asked about four sets of product groupings: (1) Heating, Cooling, and Water Heating Products, (2) Home Electronics and Office Equipment, (3) Home Appliances and Lighting, and (4) Homes and Building Materials. The sample sizes (n) for these product groupings were 1060, 952, 1085, and 867, respectively.

Influence of the ENERGY STAR Label

In 2019, 68 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 74 percent in 2016. This difference is not statistically significant (p-value = 0.1481). From 2016 to 2019, all proportions are statistically similar.

Influence of the ENERGY STAR Label on Purchase Decisions¹⁴ **[Base = Recognize label (aided) and ENERGY STAR purchasers]**

Influence of the Label on Purchasing Decisions	2019 (n=446) Maximum	2016 (n=310) Maximum
Very much	41%	45%
Somewhat	27%	29%
Slightly	11%	11%
Not at all	20%	15%
Total	100%	100%

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

¹⁴ 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 Most Efficient Designation

In 2011, CEE added a brief series of questions¹⁵ to collect information on recognition and influence of the annual ENERGY STAR Most Efficient designation. Only respondents that recognize the ENERGY STAR label (aided) were asked the ENERGY STAR Most Efficient questions. These questions were continued in the 2019 survey.

In 2019, 20 percent of households that recognized the ENERGY STAR label (aided) indicated they had seen or heard of ENERGY STAR Most Efficient. This is similar to 23 percent of households in 2016 (p-value = 0.1918).

Among households that had seen or heard of ENERGY STAR Most Efficient:

- Forty-one percent were aware that products designated “ENERGY STAR Most Efficient 2019” represent a subset of ENERGY STAR qualified products within a given product category. This is similar to 38 percent in 2016 (p-value = 0.6342).
- Just over half (52 percent) recognized the ENERGY STAR Most Efficient marketing graphic when it was shown to them; this is also similar to 46 percent in 2016 (p-value = 0.4042).
- Sixty-eight percent of households agreed (somewhat or strongly) with the statement: “All other things equal, I would buy a product because it is designated as ENERGY STAR Most Efficient.” This is an increase from last year (51 percent), (p-value = 0.0097).

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	2019 (n=149)	2016 (n=135)
Strongly disagree	9%	6%
Somewhat disagree	1%	4%
Neither agree nor disagree	22%	39%
Somewhat agree	38%	32%
Strongly agree	30%	19%
Total	100%	100%

¹⁵ The ENERGY STAR Most Efficient questions, Q17 – Q20, are shown in Appendix D, page D-4.

Rebate and Financing Influence

In 2019, the percentage of households that knowingly purchased an ENERGY STAR-labeled product and received a rebate or reduced-rate financing was 15 percent, similar to the prior survey (p-value = 0.9642). Of these, 66 percent would have been “very likely” to purchase the ENERGY STAR product if financial incentives had not been available. This is also similar to 2016 at 48 percent (p-value = 0.1266). Fewer respondents in 2019 (<1 percent) than 2016 (10 percent) claimed they were “not at all likely” to purchase an ENERGY STAR product without a financial incentive; this difference is statistically significant at the 10-percent level (p-value = 0.0987). All other levels of likelihood to purchase an ENERGY STAR product without a financial incentive were similar from 2016 to 2019.

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	
	2019 (n=398)	2016 (n=290)
Yes	15%	14%
No	85%	86%
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	
	2019 (n=61)	2016 (n=44)
Very likely	66%	48%
Somewhat likely	28%	33%
Slightly likely	6%	10%
Not at all likely*	0%	10%
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?”

* 2019 and 2016 proportions are statistically different from each other at the 10-percent level of significance (p-value ≤ 0.10).

Loyalty to ENERGY STAR

Loyalty 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, 34 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 statistically greater than the value in 2016 at the 10-percent level (p-value = 0.0548).

The likelihood of recommending ENERGY STAR products to a friend is greater than “5” for 71 percent of all surveyed households. This is statistically less than the prior survey result of 80 percent at the 5-percent level (p-value = 0.0149).

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

Likelihood Recommend ENERGY STAR Products	% Households		P-values
	2019 (n=450)	2016 (n=265)	
10 - Extremely likely*	34%	27%	0.0548
9***	7%	20%	0.0002
8	13%	13%	0.9264
7**	10%	17%	0.0354
6	6%	3%	0.1422
5***	18%	10%	0.0052
4**	2%	6%	0.0196
3	1%	3%	0.1451
2**	2%	0%	0.0209
1	2%	1%	0.3752
0 - Extremely unlikely***	4%	0%	<0.0001
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.”

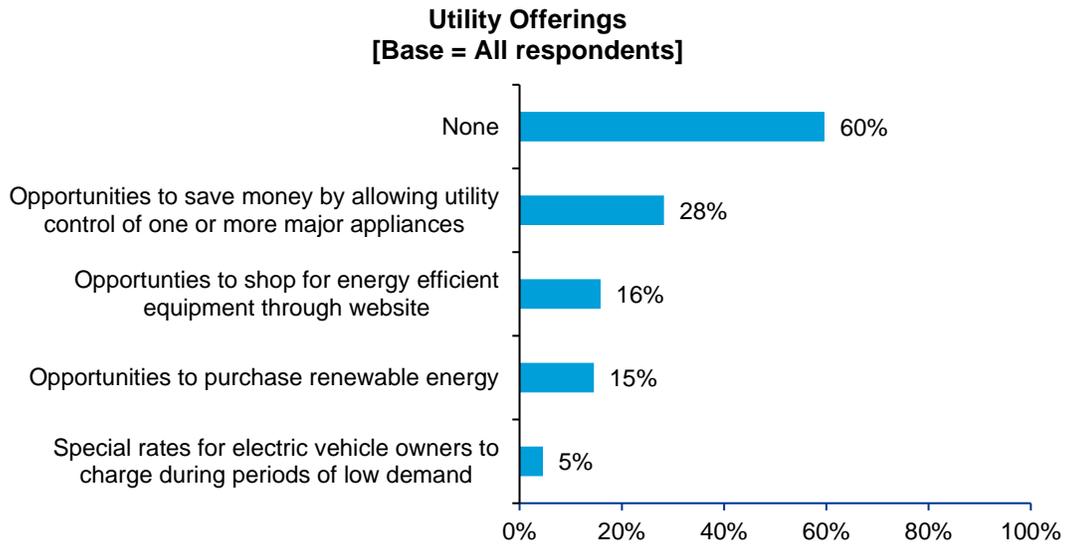
*** 2019 and 2016 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01).

** 2019 and 2016 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).

EMERGING TRENDS

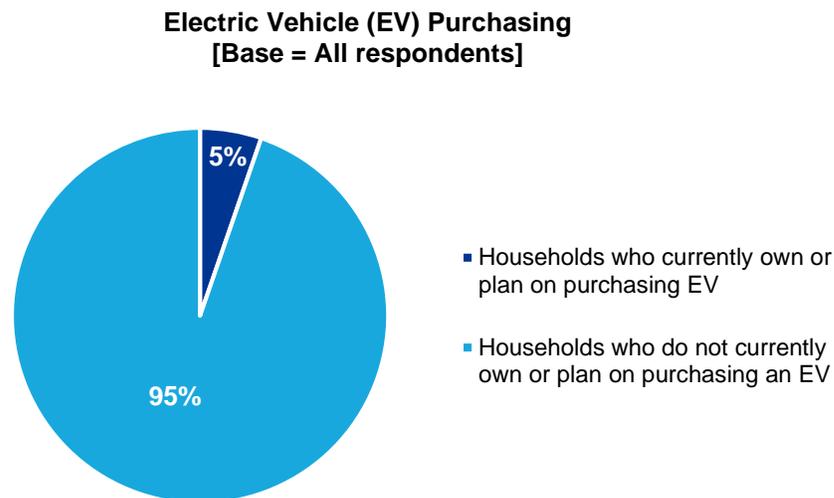
Utility Offerings

The 2019 survey included a new question that asked, “Does your utility offer any of the following?” Respondents were able to select multiple offerings.



Electric Vehicles

The 2019 survey added a new question that asked, “Do you or someone in your household currently own or plan on purchasing an electric vehicle in the next 12 months?” Five percent of households reported owning or planning to purchase an electric vehicle.



APPENDIX A: DETAILED METHODOLOGY

In late November 2019, the Consortium for Energy Efficiency (CEE) fielded a questionnaire to obtain information at the national level on the extent to which consumers recognize the ENERGY STAR label, understand its intent, and utilize or are influenced by the label in their energy-related purchasing decisions. The questionnaire was similar to the Internet/WebTV-based questionnaires fielded in previous years (2001 through 2016), though this year, the CEE made a more substantive update to the survey instrument. As in previous years, CEE made the survey data available to the U.S. Environmental Protection Agency (EPA) for analysis.

The survey was fielded from November 27 through December 5, 2019.¹⁶

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.

¹⁶ This year's survey was fielded 5 to 8 weeks later than a more typical timeframe for this survey. The 2016 survey was fielded from September 13 through September 26, the 2015 survey was fielded from October 21 through November 2, the 2014 survey was fielded from November 11 to November 20, and the 2013 survey was fielded from September 17 to October 1. It is not known whether this shift in timeframe had an influence on 2019 results.

QUESTIONNAIRE DESIGN

In 2019, CEE conducted the ENERGY STAR survey using a questionnaire designed to be delivered by Internet (mobile or desktop). The survey was conducted Ipsos using the web-enabled KnowledgePanel®, a probability-based panel designed to be representative of the U.S. population. Initially, participants are chosen scientifically by a random selection of telephone numbers and residential addresses. Persons in selected households are then invited by telephone or by mail to participate in the web-enabled KnowledgePanel®. For those who agree to participate, but do not already have Internet access, Ipsos provides at no cost a laptop and ISP connection. People who already have computers and Internet service are permitted to participate using their own equipment. Panelists then receive unique log-in information for accessing surveys online, and then are sent emails throughout each month inviting them to participate in research. Participants in this survey were then randomly selected from the panel. Only one member per household in the random sample was contacted.

Data collected using the 2019 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.

Survey Objectives

In designing the 2019 questionnaire, CEE aimed to shorten and streamline the questionnaire based on lessons learned from prior years' analyses while maintaining the ability to compare results for core indicators over time.

The 2019 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 purchased in the past year
- Products that respondents have purchased that displayed the ENERGY STAR label on the product, packaging, or product literature
- Influence of the presence of the ENERGY STAR label on the purchasing 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
- 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 the ENERGY STAR Most Efficient designation.

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 product literature) had the ENERGY STAR label.

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

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.¹⁷ Results from that timeframe were also analogous to telephone surveys for aided recognition.¹⁸

¹⁷ National Analysis of CEE 2001 ENERGY STAR Household Surveys. U.S. EPA, 2002.

¹⁸ Tannenbaum, Bobbi and Shel Feldman. "ENERGY STAR Awareness as a Function of Survey Method." IEPEC, 2001.

Changes to the Questionnaire

In 2019, CEE made a more substantive update to the survey instrument, removing, adding, and updating a substantial number of the survey questions. These survey changes and the supporting rationale are detailed in the tables below.

Removed survey questions	
Deletion/change	Rationale
Eliminated the rotation of an old version of the ENERGY STAR label from the recognition series.	The current version of the ENERGY STAR label has been in use since 2002, allowing ample room for transition.
Open-ended question: “What types of products, goods, or services do you think of when you think of the ENERGY STAR label?”	Asking this question once in an open-ended way and then asking again using a product pick list was potentially burdening to respondents. The pick list remains in the survey.
Question series: “How strongly do you agree or disagree with the following [attitudinal statements] about ENERGY STAR-labeled products?”	This was an experimental series added to the survey in 2005. In general, respondents agreed with positive statements about ENERGY STAR and disagreed with negative statements about the label, with little variation from year to year.
“What is your role in the household purchasing decisions?”	The answer to the question might vary by product category but was asked broadly, the question may have been off-putting for respondents, and it was not included in the national analysis.
Light bulb purchaser questions: <ul style="list-style-type: none"> ○ “Did you install the light bulb(s) you purchased in a light fixture?” <ul style="list-style-type: none"> ○ If yes: “What kind of bulb(s) did you purchase?” ○ If yes: “What kind of bulb(s) did you replace?” 	This was an experimental series added in 2008 to address CEE member interest in understanding whether consumers stocked up on energy efficient light bulbs, whether they were purchasing LEDs or CFLs, and what type of bulb they were typically replacing. The lighting industry has moved away from CFL technology.
Lighting fixture purchaser question: <ul style="list-style-type: none"> ○ “Which kind of ENERGY STAR-labeled lighting fixture did you purchase?” 	This was an experimental question added in 2008 to address CEE member interest in fixture type as some lighting sockets are used more frequently than others.
Shopping series: “Have you or someone else in your household been shopping in a store in the last 12 months for any of the products listed?” For each product selected, “When you shopped for [product], did you look for the ENERGY STAR label?” “When you shopped for [product], did you ask a salesperson for a product with the ENERGY STAR label?”	This question series was potentially burdensome for respondents and not particularly useful. Removing this series also freed up space to ask about purchasing channels.
Product satisfaction series, which asked respondents that purchased a product (regardless of whether it was ENERGY STAR labeled or not), how satisfied they were with their purchase.	This was an experimental series added in 2005. In general, there were too few purchasers for most product categories to draw meaningful inferences.
Connected series: “Have you ever heard of the ‘connected’ in relation to ENERGY STAR products? If yes, “What does ENERGY STAR ‘Connected’ mean to you? “	ENERGY STAR is not using the term “connected” in consumer messaging or education.

Added survey questions	
Addition	Rationale
<p>“To your knowledge, does your utility offer the following (select all that apply):</p> <ul style="list-style-type: none"> • Opportunities to save money by allowing utility control of one or more major appliances (e.g., heating and cooling equipment, water heater) during times of high demand? • Special rates for electric vehicle owners to charge during periods of low demand? • Opportunities to purchase and/or locate energy efficient equipment through their website. • Opportunities to purchase renewable energy?” 	<p>Added to address CEE member interest in emerging utility services.</p>
<p>“Do you or does someone in your household currently own or plan on purchasing an electric vehicle in the next 12 months?” (Y/N)</p>	<p>Added to address CEE member interest in electric vehicle usage.</p>
<p>“What is the primary fuel used to heat your home?”</p> <ul style="list-style-type: none"> • Electric • Gas • Other • Don't know” 	<p>Added to enable CEE members to conduct additional analysis by primary fuel type.</p>
<p>Asked for each product selected as purchased in past 12 months: “How did you purchase the product?”</p> <ul style="list-style-type: none"> • Online • In store • From a contractor” 	<p>Added to address CEE member interest in purchasing channels.</p>

Updates to the product list	
Change	Rationale
<p>Consolidated product groupings into the following categories:</p> <ul style="list-style-type: none"> • Home appliances and lighting • Home office and electronic equipment • Heating and cooling products • Homes and building products 	<p>Product categories were consolidated in part due to the changing nature of products (e.g., blurring line between electronics and home office equipment).</p>
<p>Updated the product pick lists as follows:</p> <p>Added:</p> <ul style="list-style-type: none"> • Air purifier • Cable/satellite box • Clothes dryer • Electric vehicle charger • Pool pump <p>Altered:</p> <ul style="list-style-type: none"> • “Computer or monitor” changed to “Computer, monitor, tablet or notebook” • “Thermostat” changed to “Smart thermostat” • “Washing machine” changed to “Clothes washer” <p>Revised and consolidated from products previously asked separately:</p> <ul style="list-style-type: none"> • Audio or video product (including DVD, Blu-ray) • Printer, copier, scanner, or combination device • Window, door, skylight, or storm window <p>Removed:</p> <ul style="list-style-type: none"> • Fax machine • Roofing material 	<p>Product pick lists were altered to reflect products currently eligible for ENERGY STAR certification, technological change, and to keep the size of the pick list manageable.</p>

Determination of Aided Recognition

In the 2019 analysis, the determination of *aided* recognition was based on the responses to three questions. Specifically:

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

ES3C: Please look at the ENERGY STAR label below. Have you ever seen or heard of this label? (Respondents were shown the 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 the ENERGY STAR label.)

Q2: 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. It was also asked to all respondents who answered ES3C)

- Respondents who answered ES3A, ES3C, or Q2 "yes" were categorized as recognizing the ENERGY STAR label (aided).
- Respondents who did not answer ES3A, or ES3C "yes" and answered Q2 "no," were categorized as not recognizing the label (aided).
- Respondents who did not answer ES3A, or ES3C "yes" and answered Q2 "don't know" or refused to answer Q2 were not included in the analysis of aided recognition. (Their data were set to missing.)

This is a change from the sequence and numbering used in the 2016 survey, which was based on the responses to five questions. In addition to the three questions above, respondents used to be shown an old version of the ENERGY STAR label in random rotation. This was eliminated from the recognition series in 2019.

SAMPLING

Sample Design

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. 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.¹⁹ In addition, CEE members may choose to sponsor more intensive sampling (i.e., an oversample) in selected localities, referred to here as *sponsor area(s)*. Only the sponsor areas located in the largest 57 DMAs are included in the national analysis. A summary of the 2019 survey sample design is provided in the table starting on the next page.

The 2019 sample was stratified based on household population. While this report does not assess findings by the stratification categories, stratification of the sample frame is believed to provide better coverage of the population across the largest 57 DMAs than a simple random sample. In previous years' studies, the largest 57 DMAs in the sampling frame were classified by publicity category, in order to assess the impact of local energy efficiency program publicity on awareness. As programs leveraging ENERGY STAR became ubiquitous throughout the country, this categorization became less meaningful, and publicity categories were frozen in 2009. This year CEE eliminated the publicity categorization and this report does not assess findings by publicity category. The publicity category sample stratification was replaced with sample stratification of the largest 57 DMAs by household population.

As shown in the table below, the largest 57 DMAs were divided into three strata based on household population.

- **Stratum 1** is the first third of the population, including the eight largest DMAs.
- **Stratum 2** is the second third of the population, including the next 16 DMAs.
- **Stratum 3** is the final third of the population, including the DMAs ranked 25 to 57.

The national sample comprises 1,000 respondents from the largest 57 DMAs. While the goal is to have each stratum represent approximately one third of the population of the largest 57 DMAs, the population totals do not perfectly align. As such, the 1,000 respondents were allocated across stratum 1 to 3 proportional to population. The sample targets and survey completes are provided in the table below. In 2019, the national sample included an additional 28 respondents beyond the required 1,000. Additionally, 212 respondents that were part of the oversample, Stratum 4 and Stratum 6, were included in the national analysis because they are in the largest 57 DMAs. In 2019, the national sample is comprised of 1,240 respondents. Each respondent receives an appropriate weight in the analysis in order to generate valid national results and facilitate comparison with data from other years.

¹⁹ Analysis included in the 2010 report showed no statistical difference for key metrics between the 57 largest DMAs and all 210 DMAs.

Summary of Sample Design

Sample Stratum	DMA Rank	Designated Market Area (DMA)	Number of Households	Cumulative % of Top-57 DMAs	Target Completes	Completed Surveys
1	1	New York (not including Sponsor Area)	2,570,069	3.4%	320	328
	2	Los Angeles	5,276,600	10.5%		
	3	Chicago	3,251,370	14.9%		
	4	Philadelphia	2,816,850	18.6%		
	5	Dallas-Ft. Worth	2,622,070	22.2%		
	6	Washington, DC (Hagerstown)	2,482,480	25.5%		
	7	Houston	2,423,360	28.7%		
	8	San Francisco-Oak-San Jose	2,414,470	32.0%		
2	9	Boston (Manchester)	2,364,870	35.2%	348	358
	10	Atlanta	2,341,390	38.3%		
	11	Tampa-St. Pete (Sarasota)	1,875,420	40.8%		
	12	Phoenix (Prescott)	1,864,420	43.3%		
	13	Seattle-Tacoma	1,854,810	45.8%		
	14	Detroit	1,777,240	48.2%		
	15	Minneapolis-St. Paul	1,713,310	50.5%		
	16	Miami-Ft. Lauderdale	1,697,840	52.8%		
	17	Denver	1,585,270	54.9%		
	18	Orlando-Daytona Beach-Melbourne	1,565,890	57.0%		
	19	Cleveland-Akron (Canton)	1,399,470	58.9%		
	20	Sacramento-Stockton-Modesto	1,357,690	60.7%		
	21	St. Louis	1,164,400	62.3%		
	22	Portland, OR	1,141,770	63.8%		
	23	Charlotte	1,129,900	65.3%		
	24	Pittsburgh	1,108,780	66.8%		
3	25	Raleigh-Durham (Fayetteville)	1,108,710	68.3%	332	342
	26	Baltimore	1,084,180	69.7%		
	27	Nashville	1,021,780	71.1%		
	28	Indianapolis	999,790	72.5%		
	29	San Diego	987,760	73.8%		
	30	Salt Lake City	935,810	75.0%		
	31	San Antonio	923,990	76.3%		
	32	Kansas City	909,420	77.5%		
	33	Hartford & New Haven	897,870	78.7%		
	34	Columbus, OH	889,600	79.9%		
	35	Cincinnati	850,030	81.0%		
	36	Milwaukee	848,420	82.2%		
	37	West Palm Beach-Ft. Pierce	829,880	83.3%		
	38	Greenville-Spartanburg-Asheville-Anderson	805,920	84.4%		

Sample Stratum	DMA Rank	Designated Market Area (DMA)	Number of Households	Cumulative % of Top-57 DMAs	Target Completes	Completed Surveys
	39	Las Vegas	766,500	85.4%		
	40	Austin	751,650	86.4%		
	41	Harrisburg-Lancaster-Lebanon-York	705,190	87.4%		
	42	Jacksonville	681,330	88.3%		
	43	Birmingham (Anniston and Tuscaloosa)	679,550	89.2%		
	44	Norfolk-Portsmouth-Newport News	678,210	90.1%		
	45	Oklahoma City	676,720	91.0%		
	46	Greensboro-High Point-Winston Salem	675,130	91.9%		
	47	Albuquerque-Santa Fe	650,890	92.8%		
	48	Louisville	647,190	93.7%		
	49	Grand Rapids-Kalamazoo-Battle Creek	639,410	94.5%		
	50	New Orleans	624,020	95.4%		
	51	Memphis	623,390	96.2%		
	52	Buffalo (not including Sponsor Area)	22,635	96.2%		
	53	Providence-New Bedford	580,120	97.0%		
	54	Fresno-Visalia	568,920	97.8%		
	55	Ft. Myers-Naples	554,430	98.5%		
	56	Richmond-Petersburg	551,850	99.2%		
	57	Little Rock-Pine Bluff	527,090	100.0%		
4	NA	Sponsor Area: New York, Largest 57 DMAs, Upstate	1,026,279	NA	59	60
5*	NA	Sponsor Area: New York, Not in Largest 57 DMAs, Upstate	1,568,436	NA	91	101
6	NA	Sponsor Area: New York, Largest 57 DMAs, Downstate	4,068,247	NA	150	152
Total: Largest 57 DMAs			79,591,650	NA	1,209	1,240

* Stratum 5 is not included in the national analysis.

Sponsor Areas

Sponsor areas are not limited to the 57 largest DMAs, however, to facilitate comparisons across years, each year the national results are based only on data collected from respondents from the 57 largest DMAs. Some of the 57 largest DMAs were also included in the sponsor areas and therefore are oversampled. The data from these respondents (as well as from the other respondents in the 57 largest DMAs) receive an appropriate weight in the analysis in order to generate valid national results and facilitate comparison with data from other years.

In 2019, New York State Research and Development Authority (NYSERDA) chose to fund additional sampling in New York State (including Long Island). NYSERDA allocated 150 sampling points to household in its Upstate region and 150 sampling points to its Downstate region. These regions were determined based on zip codes provided by NYSERDA. All Downstate households (Stratum 6) are in the largest 57

DMAs, while in Upstate households, Stratum 4 had sampling both within and outside the national sample frame, and Stratum 5 fell outside the national sample frame (i.e., within DMAs that were ranked 58th or below in share of the U.S. household population).

The New York State oversample from largest DMAs are appropriately weighted and included in the national analysis. The oversample from the DMAs not in the largest 57 DMAs are not included in the national analysis.

NYSERDA Sponsor Area

Region	Sample Stratum	DMA Size	Included in National Analysis	DMA
Upstate	4	Largest 57	Yes	Buffalo (Rank 52)
	5	Not in Largest 57	No	Albany-Schenectady-Troy (Rank 59)
				Rochester (Rank 80)
				Syracuse (Rank 81)
				Burlington-Plattsburgh (Rank 96)
				Binghamton (Rank 160)
				Utica (Rank 169)
				Elmira (Corning) (Rank 176)
Watertown (Rank 178)				
Downstate	6	Largest 57	Yes	New York (Rank 1)

Weighting Procedures

Ipsos²⁰, the company that provided the Internet survey service, developed the weights used in the analysis. Ipsos 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 aligns the panel with the basic demographic characteristics of the U.S. population.

After the field data were collected, Ipsos 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.

²⁰ Ipsos, acquired GfK, which was the company that CEE used for prior year surveys.

DATA COLLECTION

Survey Fielding Period

The survey began on November 27 and closed on December 5, 2019.

Response Rate

The overall response rate was 6 percent for the CEE 2019 ENERGY STAR Household Survey. This level of response is typical for Ipsos surveys and is similar to the 7 percent response rate for the prior survey (2016).

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 2019 ENERGY STAR Household Survey, the return rate was 52 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 the Ipsos panel as a proportion of the number of households asked to participate. The recruitment rate was 12 percent. Thus, the response rate for the CEE 2019 ENERGY STAR Household survey was the product of the survey-specific return rate of 52 percent and the recruitment rate of 12 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 2019 ENERGY STAR Household Survey Response Rate²¹

Response Rate Factors	Number or % of Respondents
Sendout/requested	2,598
Completed	1,341
Return rate	52%
Recruitment rate	12%
Response rate	6%

²¹ Only respondents from Top-57 DMAs are included in this table.

NATIONAL ANALYSIS

DMAs Included

To facilitate comparisons across years, the national results were based only on data collected from respondents from the 57 largest DMAs. Some of the 57 largest DMAs are also included in the sponsor areas and therefore were oversampled. The data from these respondents, as well as from the other respondents in the 57 largest DMAs, received an appropriate weight in the analysis in order to generate valid national results and comparison with data from other years.

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. For any given question, refusal to answer and “don’t know” responses are not included (i.e., 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. Ipsos—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	3.2%
Householder/respondent age	25-34	6.6%
Householder/respondent gender	Gender	+/- 0.1%
Dwelling type	Single-family, attached	3.6%
Own/rent	Own/rent	+/- 0.2%
Household annual income	≥\$75,000 ^a	12.0%

^aCategories are not directly comparable. Census uses \$50,000-\$79,999 and ≥\$80,000.

The largest differences (in absolute value) between the weighted survey data and national Census data, at 12.0 and 6.6 percentage points, are the proportion of households in the \$75,000 and over income category and the proportion of householder/respondents aged 25-34, respectively. The difference in the proportion of those that live in a single-family, attached homes is third, at 3.6 percentage points, and the proportion of respondents with one person in their household is the fourth largest, at 3.2 percentage points. Differences between the weighted survey data and Census data for other demographic characteristics of the population—owner/renter status, and gender—are small, at less than a percentage point.

Household Size Distribution

Number of Persons in Household	Census % Dwelling Units ^a	Survey Estimate Minus Census % Dwelling Units
One	27%	-3.2%
Two	34%	1.6%
Three	16%	0.6%
Four	13%	-0.4%
Five or more	10%	2.1%
Total (%)	100%	
Total (1,000s)	121,560	

^aU.S. Census Bureau, American Housing Survey, 2017.

Age Distribution

Householder/ Respondent Age	Census % Householders ^a	Survey Estimate Minus Census % Householders
18-24 ^b	4%	4.8%
25-34	15%	6.6%
35-44	17%	-1.5%
45-54	20%	-4.9%
55-64	20%	-1.0%
65 or older	24%	-4.1%
Total (%)	100%	
Total (1,000s)	121,560	

^aU.S. Census Bureau, American Housing Survey, 2017.

^bCensus, under 25 years; Ipsos, 18-24 years.

Gender Distribution

Householder/ Respondent Gender	Census % Population ^a	Survey Estimate Minus Census % Population
Female	51%	0.1%
Male	49%	-0.1%
Total (%)	100%	

^aU.S. Census Bureau, 2012-2017 American Community Survey 5-Year Estimates.

Dwelling Type Distribution

Dwelling Type	Census % Dwelling Units ^a	Survey Estimate Minus Census % Dwelling Units
Single-family, unattached	63%	0.9%
Single-family, attached	7%	3.6%
Bldg. (>=2 units)	24%	-1.7%
Mobile home	6%	-2.9%
Total (%)	100%	
Total (1,000s)	118,221	

^a U.S. Census Bureau, American Housing Survey, 2017.

Own/Rent Distribution

Own/Rent	Census % Households ^a	Survey Estimate Minus Census % Households
Own	63%	0.2%
Rent	37%	-0.2%
Total (%)	100%	
Total (1,000s)	118,826	

^a U.S. Census Bureau, 2012-2017 American Community Survey 5-Year Estimates.

Income Distribution

Total Household Annual Income (before taxes)	Census % Households ^a	Survey Estimate Minus Census % Households
Less than \$15,000	10%	-5.1%
\$15,000-\$24,999	9%	-2.2%
\$25,000-\$49,999	21%	-4.1%
\$50,000-\$74,999	17%	-0.5%
\$75,000 and over	43%	12.0%
Total (%)	100%	
Total (1,000s)	128,579	

^a U.S. Census Bureau, CPS 2018 Annual Social and Economic Supplement, Table HINC-01 Selected Characteristics of Households for All Races.

Primary Fuel Source

In 2019, CEE added a question about the primary fuel source used for home heating. CEE members include electric only, gas only, and dual fuel utilities. Adding this question was intended to enable members to use the dataset to conduct additional research on topics of interest, such as trends in electrification. The addition of this demographic is *not used as a variable in weighting survey responses*. However, it is worth understanding how responses compare to the primary fuel source distribution found in the U.S. Census. In general, responses were similar to the primary fuel source distribution of the U.S. population. The largest difference (in absolute value) between the survey data and national Census data is small, at 4.1 percent, for the “Electricity” category. All other differences between the sample and Census data are (in absolute value) 2.2 percent or less.

Primary Fuel Distribution
[Base = All respondents]

Primary Fuel Used to Heat Home	2019 Survey estimate	Census % Households^a	Survey Estimate Minus Census % Households
Electricity	43%	39%	4.1%
Natural Gas	46%	48%	-2.2%
Propane	4%	5%	-0.8%
Fuel Oil	5%	5%	-0.2%
Wood	1%	2%	-0.7%
Other	2%	2%	-0.3%
Total (%)		100%	
Total (1,000s)		120,063	

^aU.S. Census Bureau, 2012-2017 American Community Survey 5-Year Estimates.

APPENDIX C: History of the Consortium for Energy Efficiency (CEE) Survey

Since first initiating its survey of ENERGY STAR household awareness in 2000, CEE members have been interested in tracking a set of key ENERGY STAR indicators over time, while simultaneously learning more about consumer behavior and perceptions of ENERGY STAR and its partners. As a result, throughout the years, modifications have been made to the survey instrument to reflect member research interests. Below are highlights of substantive changes made throughout the years. More details about these changes can be found in the “Appendix A, Detailed Methodology” section of subsequent reports, which can be accessed via energystar.gov/publications.

2000

The first survey was conducted as a mail survey.

The sample was stratified by publicity in order to assess the effects of publicity from CEE member-funded energy efficiency programs on ENERGY STAR awareness, understanding, and use.

2001

Wishing to transition to a WebTV panel to reduce time in field and improve response rates, CEE members fielded multiple surveys: a mail survey; a follow up telephone survey to assess non-response effects, if any, from the mail survey; and a WebTV survey. EPA’s national analysis found that for major ENERGY STAR indicators, WebTV results were similar to mail survey results.

CEE simplified the publicity categorization.

CEE added a question on likelihood to recommend ENERGY STAR labeled products to a friend using a 4-point scale (very likely to not at all likely).

2002

Comfortable with comparative performance, CEE fielded a single survey via a WebTV panel.

Questions were added on 1) the number of bedrooms in the home, 2) whether anyone in the household had been shopping in store in the last 12 months for a) listed products or b) a newly built home.

2003

CEE changed the aided recognition question to accommodate a new version of the ENERGY STAR label.

An experimental question series was added to understand the extent consumers agreed or disagreed with a number of attitudinal statements about their view of companies that produce or sell ENERGY STAR-labeled products (5-point response scale; strongly disagree to strongly agree). Hereafter referred to as the “supplier perception series.”

2004

Respondents who indicated they used the Internet to obtain information about products, were asked a new follow-on question about the type of Internet sources they were most likely to rely on.

An experimental series about consumer perceptions of ENERGY STAR labeled products was added (5-point response scale; strongly disagree to strongly agree). Hereafter referred to as “perceived characteristics series.”

2005

Questions addressing sources respondents consulted when purchasing heating and cooling products and other types of energy-using products were removed.

Questions were added to address:

- The types of products and services consumers think of when they think of the ENERGY STAR label
- Who consumers think decides if a product deserves the ENERGY STAR label
- Consumer satisfaction with recently purchased energy-using products.

The influence of the ENERGY STAR label on consumers’ purchasing decisions was changed from a single question (i.e., “For any ENERGY STAR-labeled product(s) you purchased”) to a separate query for each ENERGY STAR-labeled product purchased.

The “perceived characteristics” experimental series was revised.

2006

A question was added regarding the respondent’s role in household purchasing decisions.

The scale for the question, “How likely are you recommend ENERGY STAR-labeled products to a friend?” was changed to an 11-point scale (extremely unlikely to extremely likely). The sequence of the survey was also modified so that the question was asked of all purchasers who were aware of ENERGY STAR regardless of whether the product(s) they purchased were ENERGY STAR labeled.

A change in sequencing related to recognition of the ENERGY STAR label(s) affected the number of respondents that were asked about their understanding of the ENERGY STAR label.

2007

The sequencing of questions related to recognition of the ENERGY STAR label(s) was returned to the sequencing used in the 2005 survey.

2008

New questions were added related to lighting:

- Respondents that purchased CFLs were asked if they installed the bulbs and what types of bulbs were replaced.
- Respondents that purchased ENERGY STAR labeled lighting fixtures were asked to identify the type of fixture purchased.

Questions addressing sources respondents consulted when purchasing 1) heating and cooling products and 2) home appliances, lighting, and electronics were restored. In addition, households who identified Internet as a source of information were asked to select the type of Internet source(s) they were most likely to rely on for information.

Minor modifications were made to the list of products respondents could associate with the label.

2009

Questions addressing sources respondents consulted when purchasing 1) heating and cooling products and 2) home appliances, lighting, and electronics were removed.

Minor modifications were made to the list of products respondents could associate with the label.

2010

The logic for the question, “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?” was changed to ask the question individually by product rather than one answer for a group of products. A follow up question was added, “When you shopped for _____, did you look for the ENERGY STAR label?”

Three additional statements were added to the “perceived characteristics series.”

Included data from all 210 DMAs and analysis showed no statistical difference for key metrics between the 57 largest DMAs and all 210 DMAs.

2011

The following questions were added to assess recognition, understanding and influence of the ENERGY STAR Most Efficient marketing designation.

- Have you ever seen or heard of ENERGY STAR Most Efficient?
- What does ENERGY STAR Most Efficient mean to you?
- Is this the graphic you have seen or heard of before? [SHOW MOST EFFICIENT DESIGNATION]
- Please indicate how strongly you agree or disagree with the statement, “All other things equal, I would buy a product because it is designated as ENERGY STAR Most Efficient.” (five-point scale strongly disagree to strongly agree.)

2012

The skip pattern was changed so only respondents who recognized the ENERGY STAR label were asked the ENERGY STAR Most Efficient marketing designation sequence.

New statements were added to the “perceived characteristics series.” However, unlike the other statements in the series, they were not specific to products with the ENERGY STAR label. The statements were as follows (5-point scale, strongly agree to strongly disagree):

- I am willing to pay more for a product that saves the most energy.
- I like to have the most advanced technology available to me
- I consider myself up to date with technology.

2013

Social media was added to the list of options for where people saw or heard something about ENERGY STAR.

A new question was added to understand whether respondents consulted energystar.gov for information on saving energy.

The skip pattern was changed in the ENERGY STAR Most Efficient sequence, so that more respondents were asked about their degree of agreement or disagreement with the statement, “All other things equal, I would buy a product because it is designated as ENERGY STAR Most Efficient.” (In 2012, only respondents that confirmed visual recognition of the marketing designation were asked this question.)

2014

Questions related to the *EnergyGuide* were removed. CEE members had included these questions to probe potential confusion between the *EnergyGuide* and ENERGY STAR labels. When the Federal Trade Commission redesigned the *EnergyGuide* label, it created space in its new design for the ENERGY STAR label to be included for product models that had achieved ENERGY STAR certification, avoiding the cost associated with printing two separate labels.

Two questions were added:

- Have you ever heard the term “connected” in relation to ENERGY STAR products?
- What does ENERGY STAR “Connected” mean to you?

Minor modifications were made to the list of products respondents could associate with the label.

2015

A new question was asked of light bulb installers to capture the different types of bulbs primarily purchased and installed.

“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.”

2016

No substantive changes were made.

APPENDIX D: 2019 SURVEY QUESTIONS AND FLOW CHART

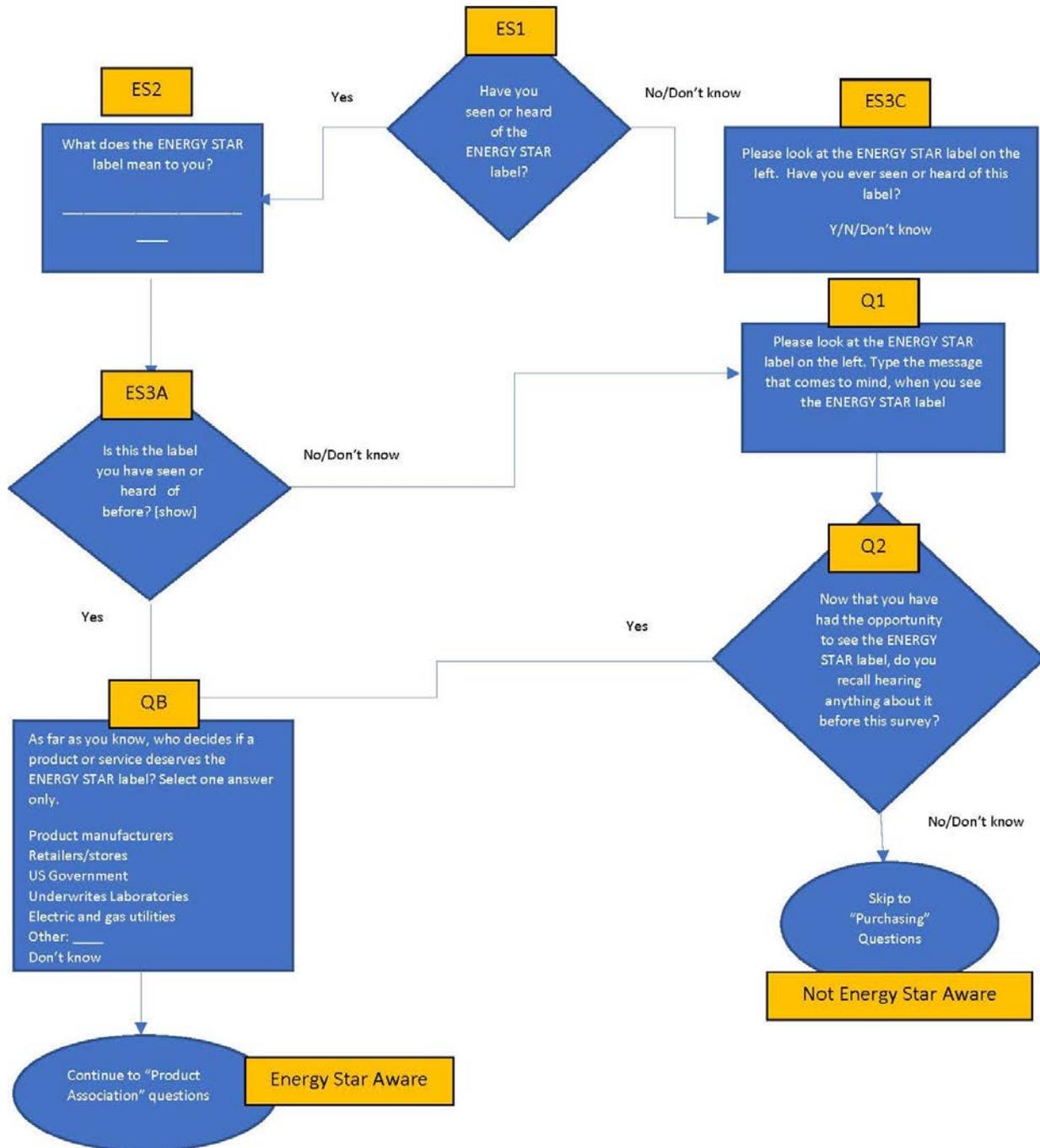


Figure 1

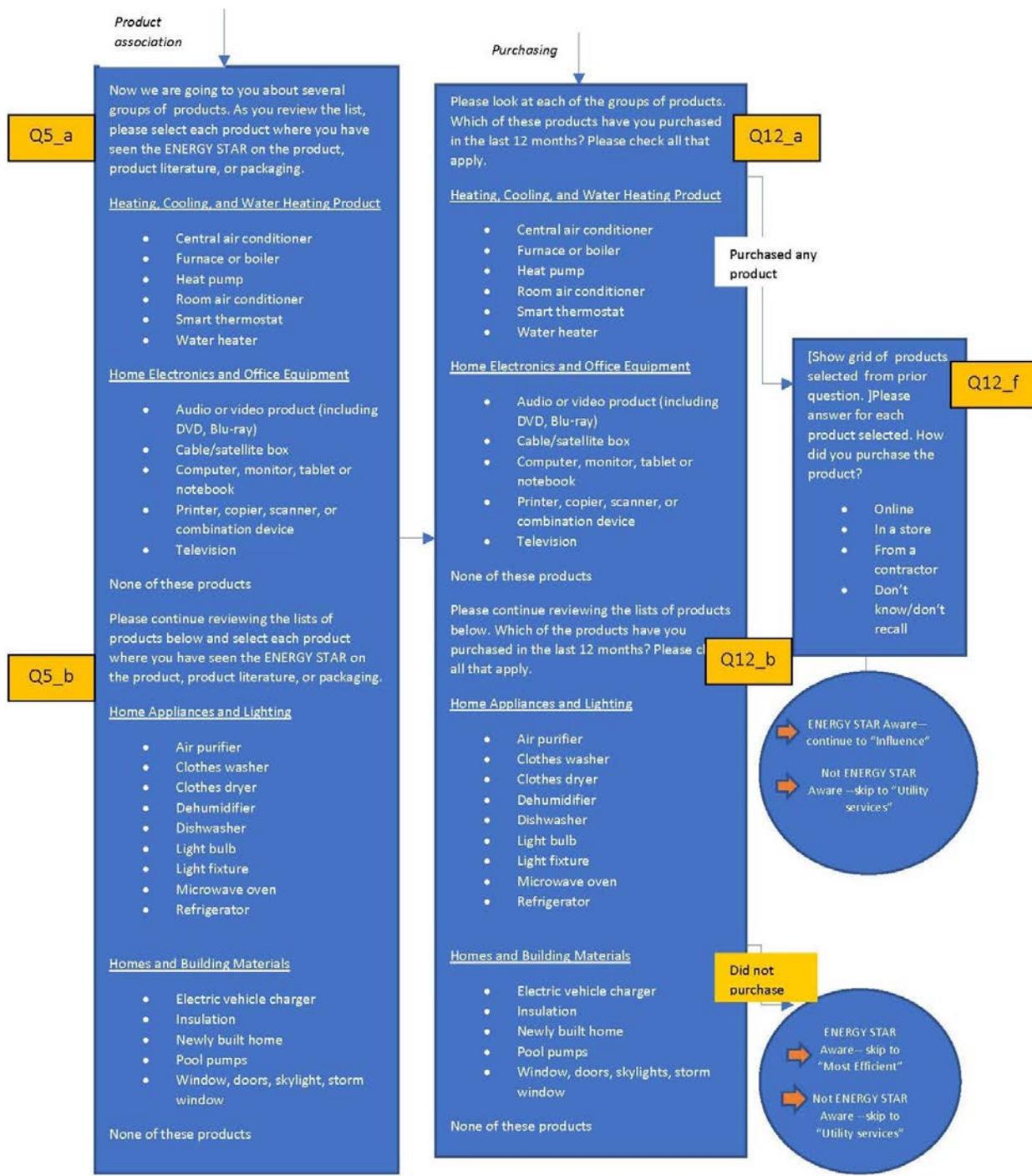


Figure 2

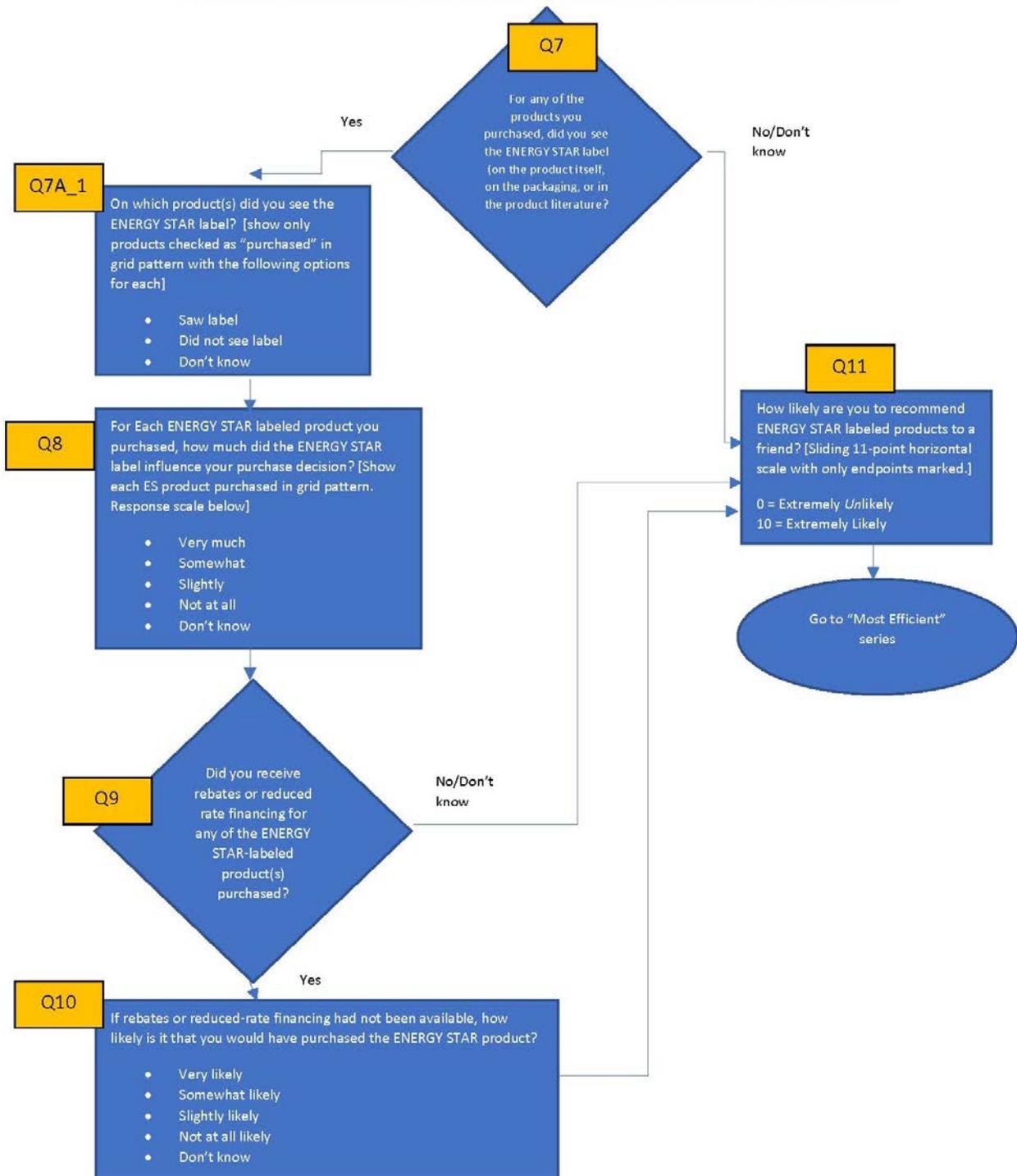


Figure 3

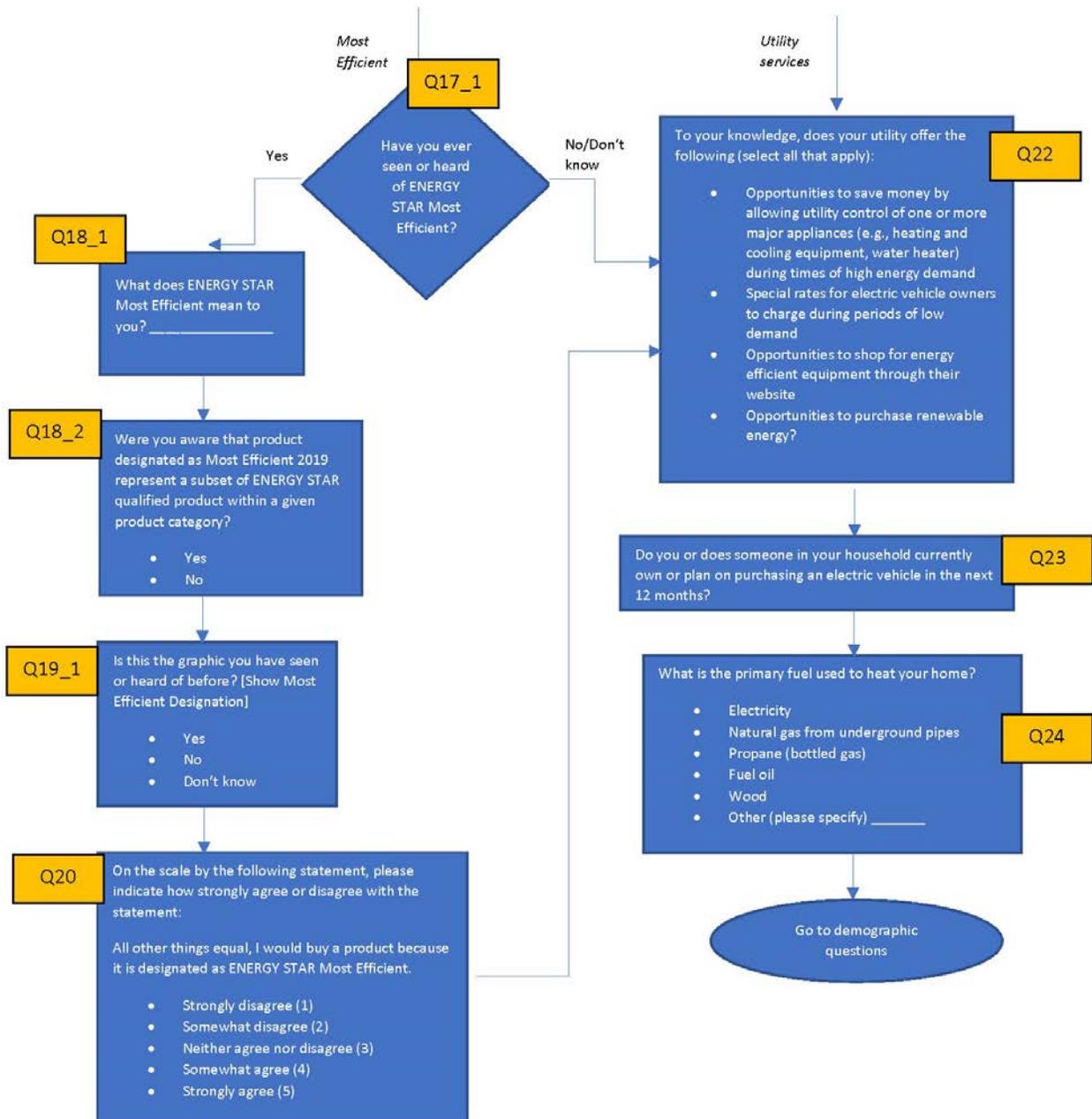


Figure 4