A photograph of a man and a young girl in a kitchen. The man, wearing a blue t-shirt and dark pants, is leaning over a white front-loading washing machine. The girl, with a large afro hairstyle and wearing a floral dress, is sitting on the floor and reaching into the machine. They are surrounded by laundry, including a red and white striped shirt and a green shirt. The kitchen has wooden cabinets and a microwave on the counter.

# NATIONAL AWARENESS OF ENERGY STAR® FOR 2022

**Analysis of CEE Household Survey**



**ENERGY STAR®.**  
The simple choice for energy efficiency.

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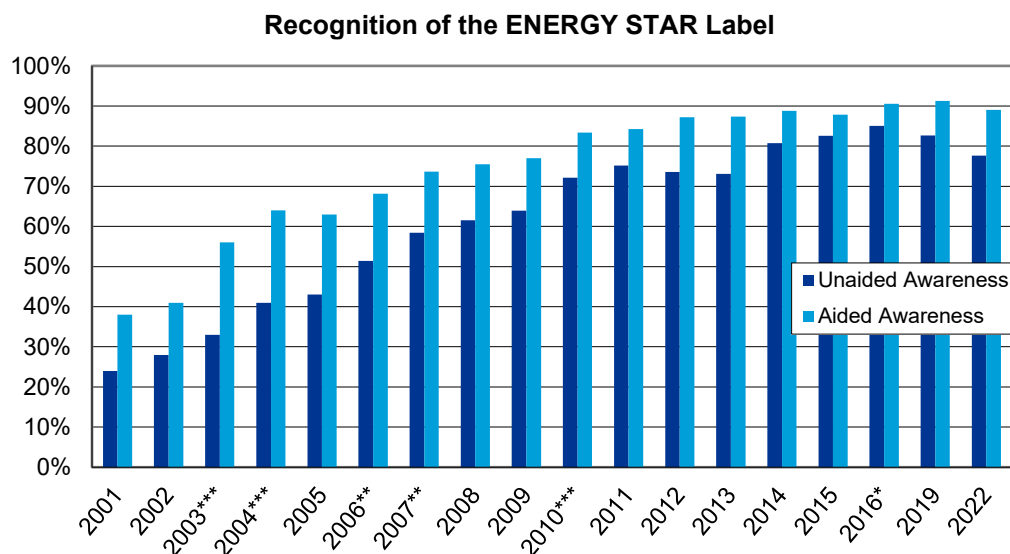
## **EXECUTIVE SUMMARY**

In the fall of 2022, members of the Consortium for Energy Efficiency (CEE) sponsored the nineteenth 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 2022 ENERGY STAR Household Survey at the national level, compares findings with the previous survey (2019), 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. When comparing results to prior years, it is important to consider the prior survey was fielded in advance of the global COVID-19 pandemic and recession.

## Key Findings at the National Level

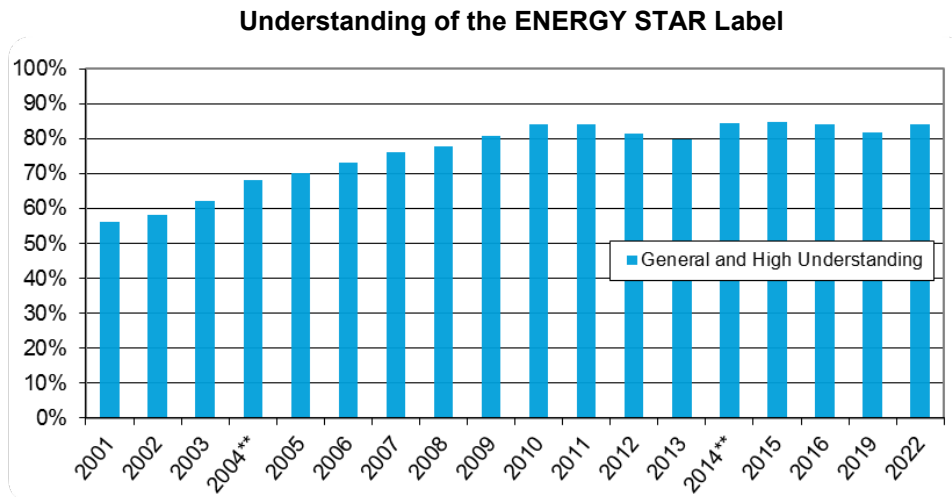
- Households continue to show high levels of **recognition** of the ENERGY STAR label. Eighty-nine percent of households recognize ENERGY STAR when shown the label. Seventy-eight percent of households reported seeing or hearing about ENERGY STAR prior to being shown the label. While aided recognition of the ENERGY STAR label is similar to the 2019 survey findings, a decline in unaided awareness is statistically significant at the 5-percent level. 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 compared to the prior survey 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, 2014, and 2022. 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 ( $p\text{-value} \leq 0.01$ ).
- \*\* 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 ( $p\text{-value} \leq 0.10$ ).

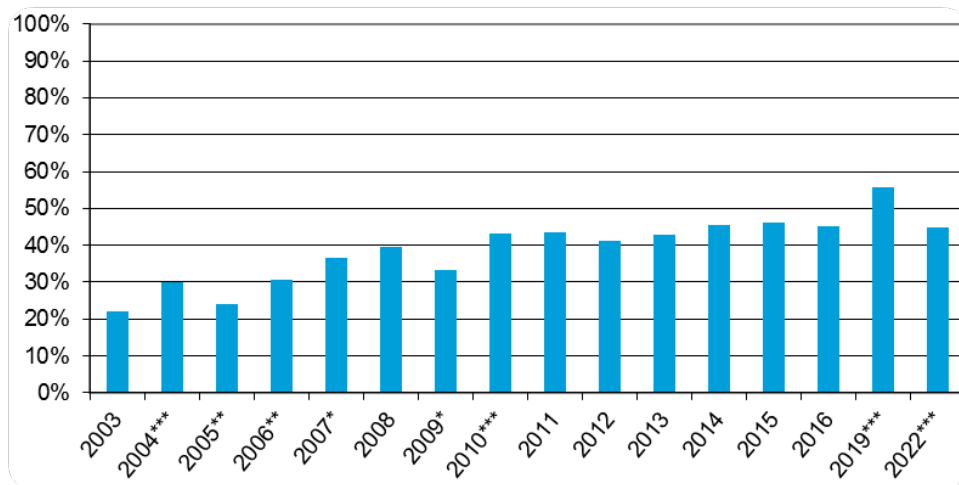
- Eighty-four percent of households had at least a general understanding of the label in 2022, which is similar to the prior survey findings (2019). Additionally, households continue to show a high **understanding** of the ENERGY STAR label. Sixty-eight percent of households had a high understanding of the ENERGY STAR label in 2022. While the findings for households with high understanding saw a statistically significant decline at the 5-percent level, there was a statistically significant increase in households with a general understanding at the 1-percent level. Trends in understanding over time are shown in the chart below.



- \*\*\* 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, 45 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. While this result is a statistically significant decline from the previous study (2019), it is similar to the levels since 2010. The increase in the proportion of households who knowingly purchased an ENERGY STAR product in 2019 was driven by increases in both the purchasing of a product in the last 12 months (75% compared to 67% in 2016 and 69% in 2022) and whether the ENERGY STAR label was seen on a purchased product (82% compared to 74% in 2016 and 73% in 2022). Trends in ENERGY STAR purchasing over time are shown in the chart below.

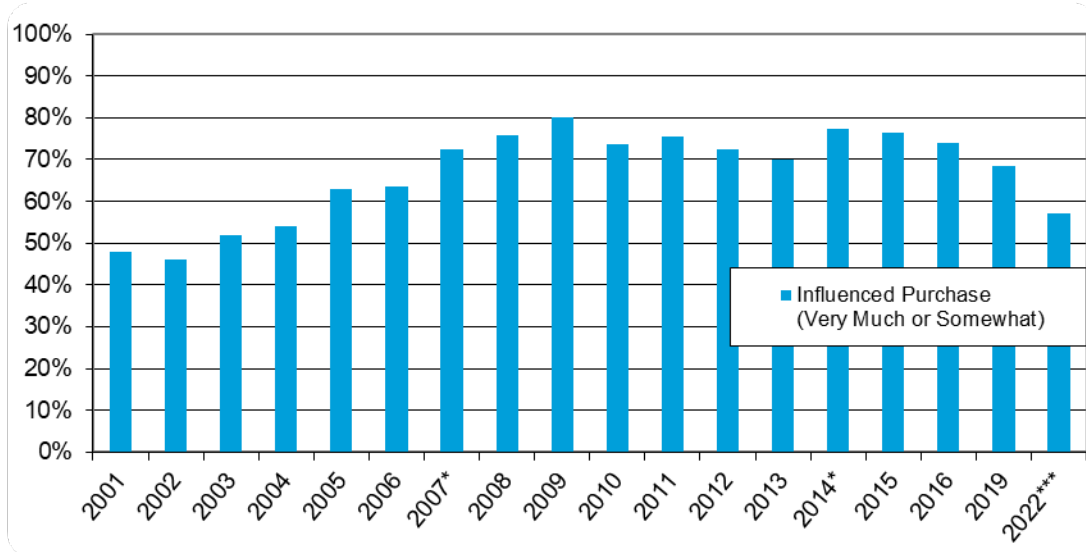
**Knowingly Purchased an ENERGY STAR Product**



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

- Fifty-seven percent of knowing purchasers reported ENERGY STAR was very much or somewhat **influential** in their purchasing decision. This is a statistically significant decline from the prior survey, consistent with a downward trend in reported ENERGY STAR influence that began in 2015, as shown in the chart below.

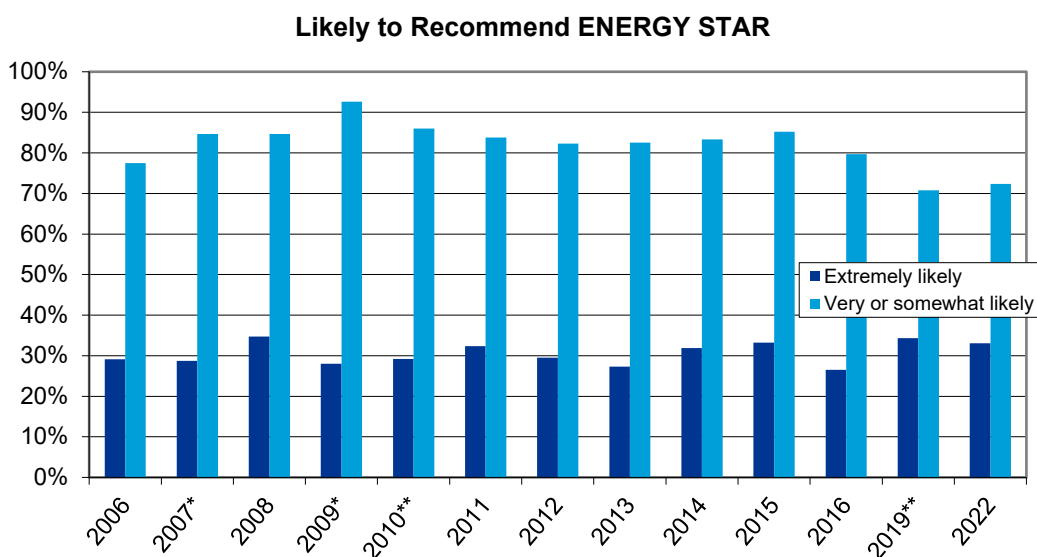
**Influence of ENERGY STAR Label on Product Purchasing**



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



- Of those who knowingly purchased an ENERGY STAR product in the past 12 months, 33 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 similar to the value in 2019. The likelihood of recommending ENERGY STAR products to a friend is greater than “5” (very or somewhat likely) for 72 percent of all surveyed households. This is similar to the prior survey result of 71 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  $\leq 0.05$ ).

\* 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  $\leq 0.10$ ).

## Conclusions

This nineteenth 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. Analysis of external factors potentially affecting survey results is beyond the scope of this report; however, results may have been influenced by one or more of the following factors: impacts of the COVID-19 pandemic on consumer purchasing habits (including trends towards increased online purchasing versus in store shopping), supply chain issues, product price inflation, and decreases in Federal funding to promote the ENERGY STAR label.

## INTRODUCTION

In the fall of 2022, members of the Consortium for Energy Efficiency (CEE) sponsored the nineteenth 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 2022 ENERGY STAR Household Survey, compares findings with the previous survey (2019), 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. Analysis of external factors potentially affecting survey results is beyond the scope of this report; however, results may have been influenced by one or more of the following factors: impacts of the COVID-19 pandemic on consumer purchasing habits (including trends towards increased online purchasing versus in store shopping), supply chain issues, product price inflation, and decreases in Federal funding to promote the ENERGY STAR label.

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. For a complete list of survey changes since inception refer to Appendix C, History of the Consortium for Energy Efficiency (CEE) 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 2022 questionnaire (Appendix D). Results presented in this report are weighted to represent population at the national level and facilitate comparisons with prior year results. (Please refer to Appendix A for details on the weighting methodology).

## METHODOLOGY OVERVIEW

In early December 2022, 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.<sup>1</sup> 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 account for about 72 percent of U.S. television households. To ensure coverage of the population across larger and smaller DMAs, these 57 DMAs were stratified into thirds (largest, middle and smallest third) and the number of respondents in each stratum was chosen in proportion to that stratum's share of households. In total, the 2022 national sample comprises 1,031 respondents from the largest 57 DMAs.<sup>2</sup>

CEE members may choose to sponsor more intensive sampling (i.e., an oversample) in selected localities, referred to in prior reports as *sponsor areas*. There were no sponsor areas in 2022.

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.

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<sup>1</sup> 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.

<sup>2</sup> In 2022, there were 31 respondents beyond the sample target of 1,000.

## KEY FINDINGS

### RECOGNITION

In 2022, 89 percent of households recognized the ENERGY STAR label when shown the label (i.e., *aided recognition*). Seventy-eight percent of households recalled having seen or heard of the ENERGY STAR label without first being shown the label (i.e., *unaided recognition*).

For the 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 2022 and 2019 surveys are summarized in the following table. Aided recognition of the ENERGY STAR label was unchanged compared to 2019. Unaided recognition of the ENERGY STAR label was also similar (p-value = 0.1279).

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

Recognize ENERGY STAR Label	2022		2019	
	Aided (n=1,003)	Unaided (n=948)	Aided (n=1,213)	Unaided (n=1,176)
Yes	89%	78%	91%	83%
Standard error	1.1%	1.6%	0.9%	1.3%

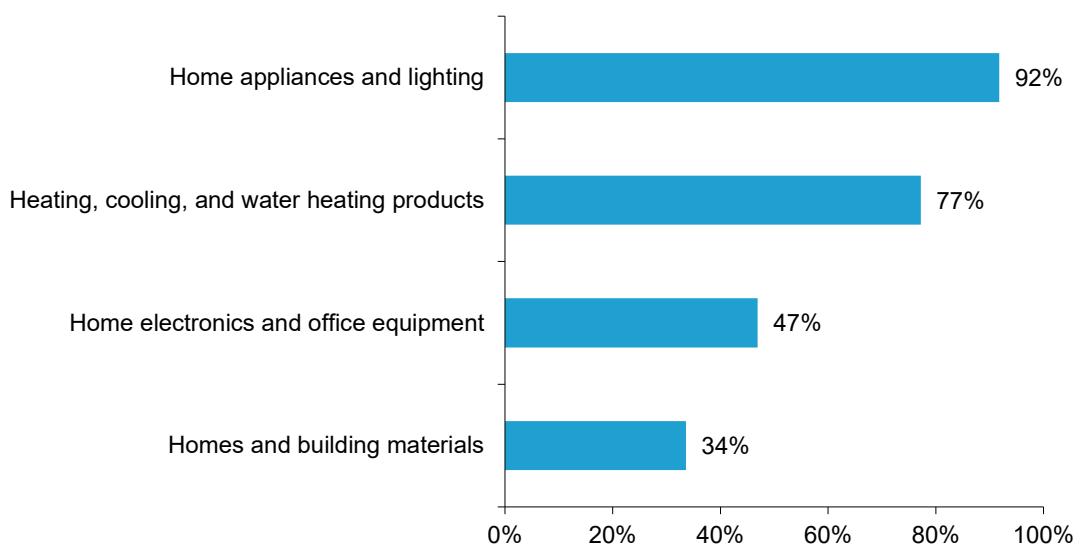
Note: The unaided recognition results for both years were based on the question ES1: "Have you ever seen or heard of the ENERGY STAR label?" The aided recognition results were based on showing the label and asking: (1) ES3A: "Is this the label you have seen or heard of before?" or (2) ES3C: "Please look at the ENERGY STAR label on the left. Have you ever seen or heard of this label?" followed by "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?"

## 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.

Consolidated product groupings were introduced in the 2019 survey; 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 92 percent and 77 percent product association, respectively.

**Product Association with the ENERGY STAR Label by Product Category**  
[Base = Recognize label (aided)<sup>3</sup>]



<sup>3</sup> 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 are 1060, 952, 1085, and 867, respectively.

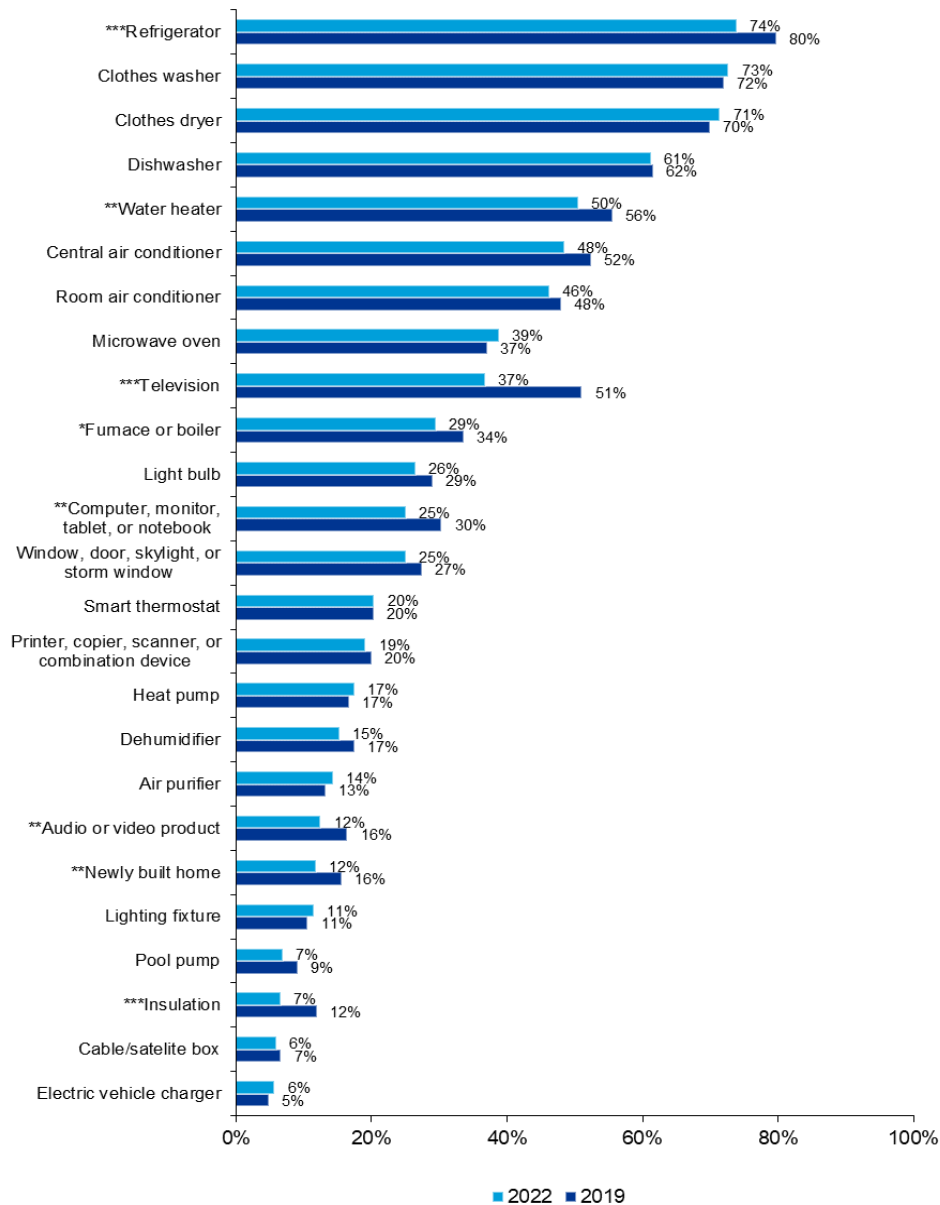


The following figure shows product associations of products that appeared on the 2022 ENERGY STAR survey, and 2019 surveys.

As demonstrated in the chart below, in 2022, 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” (74 percent), “Clothes washers” (73 percent), “Clothes dryers” (71 percent), and “Dishwashers” (61 percent).

Additionally, the chart shows product associations decreased for 8 out of 25 products that appeared on both the 2022 and 2019 ENERGY STAR surveys. While there continues to be a high level of association between the ENERGY STAR label and products such as refrigerators that have been historically supported by regional energy efficiency programs, the decrease for this product is noteworthy.

**Product Association with the ENERGY STAR Label**  
**[Base = Recognize label (aided)<sup>4</sup>]**



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.”

- \*\*\* 2022 and 2019 proportions are statistically different from each other at the 1-percent level of significance (p-value  $\leq 0.01$ ).
- \*\* 2022 and 2019 proportions are statistically different from each other at the 5-percent level of significance (p-value  $\leq 0.05$ ).
- \* 2022 and 2019 proportions are statistically different from each other at the 10-percent level of significance (p-value  $\leq 0.10$ ).

<sup>4</sup> 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 894, 894, 895, and 895, respectively.

## UNDERSTANDING

In 2022, 84 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 (17 percent) was small compared with the proportion that exhibited a high understanding (68 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 2022 and 2019 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 declined from 74 percent in 2019 to 67 percent in 2022 (p-value = 0.0060); however, the proportion of respondents with at least a general understanding of the label increased slightly and is statistically consistent from 2019 to 2022, 82 percent and 84 percent, respectively (p-value = 0.2549).

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

<b>Level of Understanding of the Label</b>	<b>2022 (n=1,031)</b>	<b>2019 (n=1,240)</b>
High understanding	67%	74%
General understanding	17%	8%
No understanding	16%	18%
<b>Total</b>	<b>100%</b>	<b>100%</b>

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

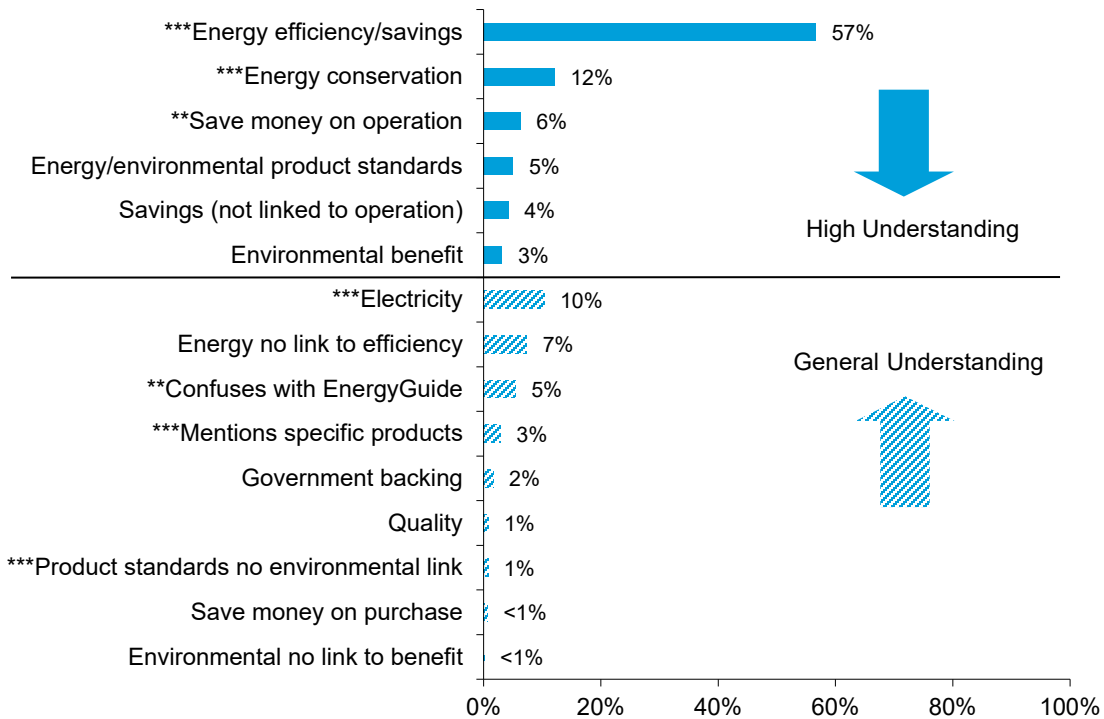
Open-ended responses to the questions on the level of understanding of the ENERGY STAR label are an indicator of how effectively EPA and its partners communicate key messages about the label and through the label itself. These responses are used in the analysis of understanding in the previous section.

By far, the most common messages associated with the label were “energy efficiency or energy savings,” which is considered high understanding of the label. Fifty-seven percent of households surveyed associated the ENERGY STAR label with this message. This is a decline from the 2019 result of 69 percent (p-value = <0.0001).

There was also an increase at the 1-percent level (p-value = <0.0001) in the percentage of households that associated the ENERGY STAR label with “energy conservation,” and a decrease at the five-percent level (p-value = 0.0347) in the percentage of households that associated the ENERGY STAR label with “save money on operation.” Both categories that are considered a high understanding of the ENERGY STAR label.

Between 2019 and 2022, there were also increases in the percentages of households that associated the ENERGY STAR label with “Electricity”, “Mentions specific products”, and “confuses with EnergyGuide.” Responses related to “Electricity” and “mentions a specific product” were statistically different from 2019 at the 1-percent level (p-value = 0.0001 and p-value = 0.0016 respectively). Responses categorized as “confuses with EnergyGuide” were statistically different from 2019 at the five-percent level (p-value = 0.0333).

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



- \*\*\* 2022 and 2019 proportions are statistically different from each other at the 1-percent level of significance (p-value  $\leq 0.01$ ). The proportion of households in 2022 is larger than 2019 for “Energy efficiency/savings,” “Energy Conservation,” “Electricity,” “Mentions specific products”, and “Product standards no environmental link.”
- \*\* 2022 and 2019 proportions are statistically different from each other at the 5-percent level of significance (p-value  $\leq 0.05$ ). The proportion of households in 2022 is smaller than 2019 for “Save money on operation” and larger than 2019 for “Confuses with EnergyGuide.”
- \* 2022 and 2019 proportions are statistically different from each other at the 10-percent level of significance (p-value  $\leq 0.10$ ).



## 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 2022, 89 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, 56 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 2022 (89 percent) is not statistically different from the 2019 result (87 percent) at the 10-percent level ( $p$ -value = 0.3534). Among households that did not recognize the label when shown it, the proportion that had at least a general understanding of the label in 2022 (56 percent) is different from the 2019 result (36 percent) at the one-percent level ( $p$ -value = 0.0090).

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

Recognize ENERGY STAR Label Aided	At Least General Understanding of Label	
	2022	2019
Yes	89%	87%
No	56%	36%
Difference (Yes minus No)	33%	51%
p-value	<0.0001	<0.0001

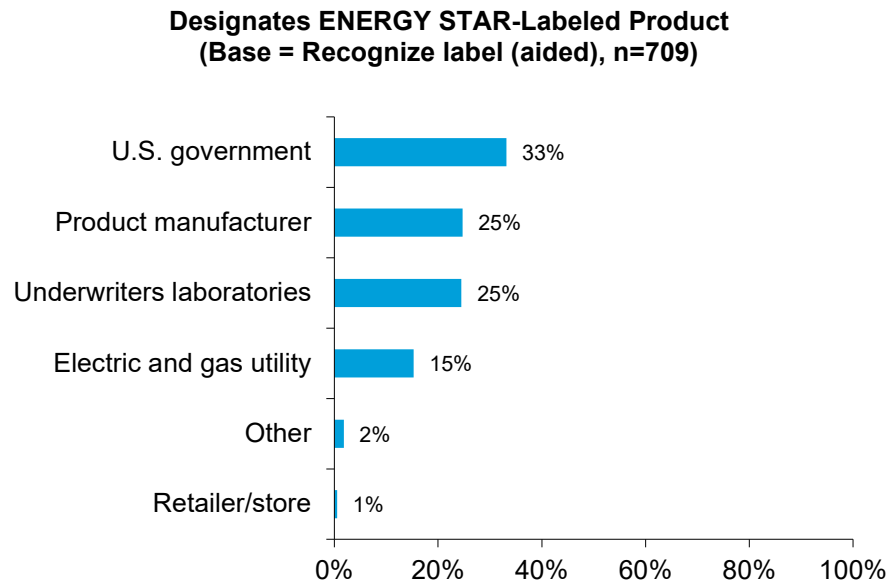
The proportion of households that recognized the label and had a high understanding of the label in 2022 (75 percent) is statistically different from the 2019 result (80 percent) at the 5-percent level ( $p$ -value = 0.0234). However, among households that did not recognize the label, there was a no statistical difference in the proportion that had a high understanding of the label at the 10-percent level ( $p$ -value = 0.3980).

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

Recognize ENERGY STAR Label Aided	High Understanding of Label	
	2022	2019
Yes	75%	80%
No	17%	13%
Difference (Yes minus No)	58%	67%
p-value	<0.0001	<0.0001

## ENERGY STAR Designation

Thirty-three percent of households that recognized the ENERGY STAR label (aided) thought that the U.S. government decides if a product deserves the label. Twenty-five percent of households thought that product manufacturers decide if a product warrants an ENERGY STAR label and another 25 percent thought Underwriters Laboratories made the decision. Additionally, fifteen percent of respondents thought that an electric or gas utility made this designation. The proportions for all categories were similar to 2019 results.



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

## 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; and
- 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 2022 (89 percent) was similar to 2019 findings (91 percent). For the other two proportions, the results for 2022 decreased compared to 2019 at the 5-percent level of significance.

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

	<b>Aided Recognition (2019 n=1,213) (2022 n=1,003)</b>	<b>Purchased Product (2019 n=1,105) (2022 n=896)</b>	<b>Knowingly Purchased ENERGY STAR product (2019 n=590<sup>5</sup>) (2022 n=454)</b>
<b>2022</b>	89%	69%	73%
<b>2019</b>	91%	75%	82%
<b>Difference</b>	-2.2%	-5.8%	-8.7%
<b>p-value</b>	0.619	0.002	0.005

Overall, an estimated 45 percent of all households knowingly purchased an ENERGY STAR product in the past 12 months. This is different from the 2019 result (56 percent) at the 1-percent level (p-value=0.0006). This decrease is driven by decreases in products purchased and knowing purchase of an ENERGY STAR product.

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

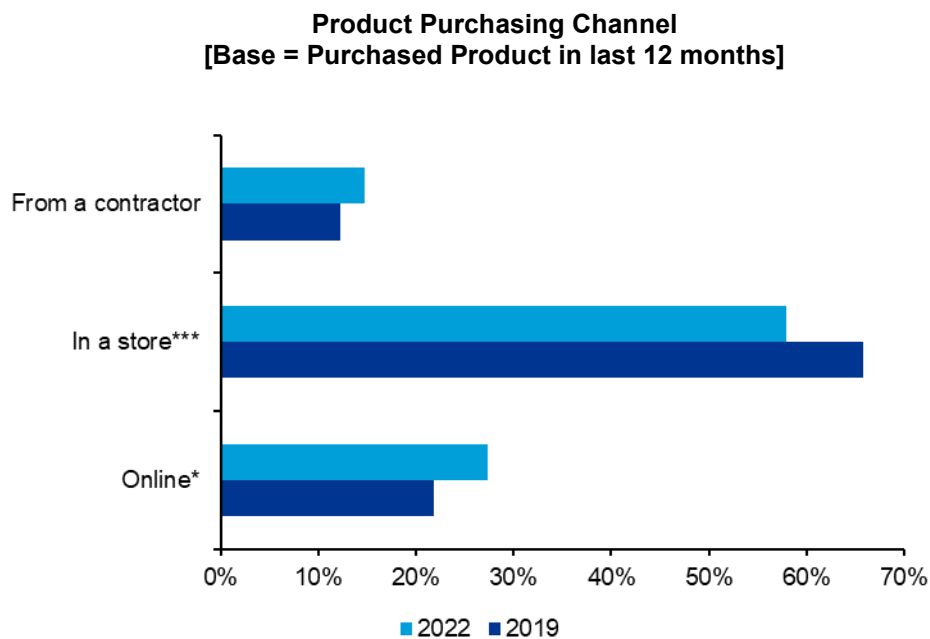
<b>Purchased ENERGY STAR product</b>	<b>2022 (n=1,003)</b>	<b>2019 (n=1,1213)</b>
Estimate (yes)	45%	56%
Standard Error	2.2%	2.2%

<sup>5</sup> This includes 1 respondent that indicated they purchased only 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.<sup>6</sup> Respondents that purchased a product were asked for each product they purchased whether it was purchased “Online,” “In a store,” or “From a contractor.”

In 2022, online purchasing increased while in store shopping decreased. Across all respondents who purchased a product in the past 12 months, 58 percent purchased the product in a store (down from 66 percent in 2019), 27 percent purchased the product online (up from 22 percent in 2019), and 15 percent purchased the product from a contractor (similar to 2019 at 12 percent).



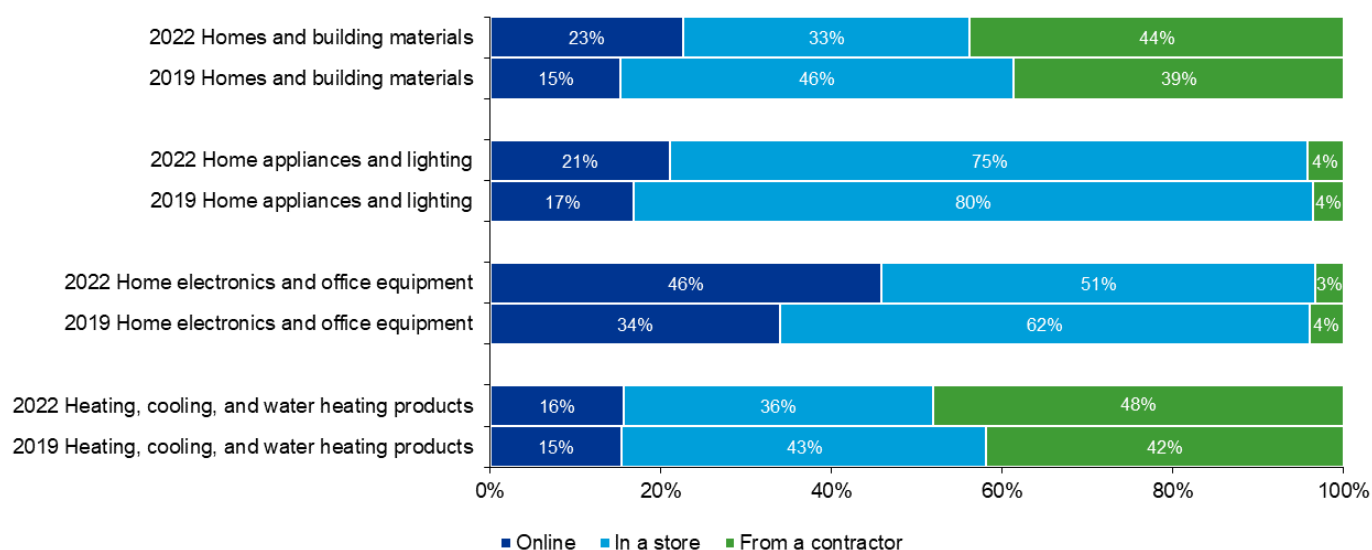
Note: Q12f: “For each product selected (in Q12), how did you purchase the product?”

- \*\*\* 2022 and 2019 proportions are statistically different from each other at the 1-percent level of significance (p-value  $\leq 0.01$ ).
- \*\* 2022 and 2019 proportions are statistically different from each other at the 5-percent level of significance (p-value  $\leq 0.05$ ).
- \* 2022 and 2019 proportions are statistically different from each other at the 10-percent level of significance (p-value  $\leq 0.10$ ).

<sup>6</sup> The ENERGY STAR Product Purchasing Source question, Q12f, is shown in Appendix D, page D-2.

Purchasing channels varied by product group<sup>7</sup>. Seventy-five percent of purchasers of “Home Appliances and Lighting” reported purchasing in a store, as did 51 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 months]**



<sup>7</sup> 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 330, 483, 767, and 115, respectively.



## Influence of the ENERGY STAR Label

In 2022, 57 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 68 percent in 2019. This difference is statistically significant (p-value = 0.0045). From 2019 to 2022, there was a decrease in the proportion of households that were “very much” influenced by the ENERGY STAR label at the 10 percent level. There was an increase in the proportion of households that were “not at all” influenced by the ENERGY STAR that was statistically significant at the one percent level. Analysis of external factors potentially affecting survey results is beyond the scope of this report; however, supply chain issues and product availability may have contributed changes in consumer purchasing decisions.

**Influence of the ENERGY STAR Label on Purchase Decisions<sup>8</sup>**  
**[Base = Recognize label (aided) and ENERGY STAR purchasers]**

<b>Influence of the Label on Purchasing Decisions</b>	<b>2022 (n=314) Maximum</b>	<b>2019 (n=446) Maximum</b>
Very much	35%	41%
Somewhat	22%	27%
Slightly	13%	11%
Not at all	30%	20%
<b>Total</b>	100%	100%

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

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<sup>8</sup> 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 questions<sup>9</sup> 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.

In 2022, 25 percent of households that recognized the ENERGY STAR label (aided) indicated they had seen or heard of ENERGY STAR Most Efficient. This is different from the 20 percent of households in 2019 (p-value = 0.0291).

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

- Thirty-seven percent were aware that products designated “ENERGY STAR Most Efficient 2022” represent a subset of ENERGY STAR qualified products within a given product category. This is similar to 41 percent in 2019 (p-value = 0.4908).
- Less than half (42 percent) recognized the ENERGY STAR Most Efficient marketing graphic when it was shown to them; this is also similar to 52 percent in 2019 (p-value = 0.1588).
- Sixty-five 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 similar to 2019 (68 percent), (p-value = 0.6193).

### 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	2022 (n=155)	2019 (n=149)
Strongly disagree	6%	9%
Somewhat disagree	4%	1%
Neither agree nor disagree	26%	22%
Somewhat agree	31%	38%
Strongly agree	34%	30%
<b>Total</b>	100%	100%

<sup>9</sup> The ENERGY STAR Most Efficient questions, Q17 – Q20, are shown in Appendix D, page D-4.

## Rebate and Financing Influence

In 2022, the percentage of households that knowingly purchased an ENERGY STAR-labeled product and received a rebate or reduced-rate financing was 17 percent, similar to the prior survey (p-value = 0.4567). Of these, 63 percent report they would have been “very likely” to purchase the ENERGY STAR product if financial incentives had not been available. This is also similar to 2019 at 66 percent (p-value = 0.8055). All other levels of likelihood to purchase an ENERGY STAR product without a financial incentive were similar from 2019 to 2022.

### 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	
	2022 (n=288)	2019 (n=398)
Yes	17%	15%
No	83%	85%
<b>Total</b>	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	
	2022 (n=45)	2019 (n=61)
Very likely	63%	66%
Somewhat likely	26%	28%
Slightly likely	9%	6%
Not at all likely	2%	0%
<b>Total</b>	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 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 statistically similar to the value in 2019 (p-value = 0.7495).

The likelihood of recommending ENERGY STAR products to a friend is greater than “5” for 72 percent of all surveyed households. This is statistically similar to the prior survey result of 71 percent (p-value = 0.6716).

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

Likelihood Recommend ENERGY STAR Products	% Households		P-values
	2022 (n=318)	2019 (n=450)	
10 - Extremely likely	33%	34%	0.7459
9	9%	7%	0.6354
8	15%	13%	0.6241
7	10%	10%	0.7817
6	7%	6%	0.5810
5	14%	18%	0.2048
4	1%	2%	0.5347
3	3%	1%	0.2749
2*	1%	2%	0.0518
1	2%	2%	0.7008
0 - Extremely unlikely	7%	4%	0.1291
<b>Total</b>	100%	100%	

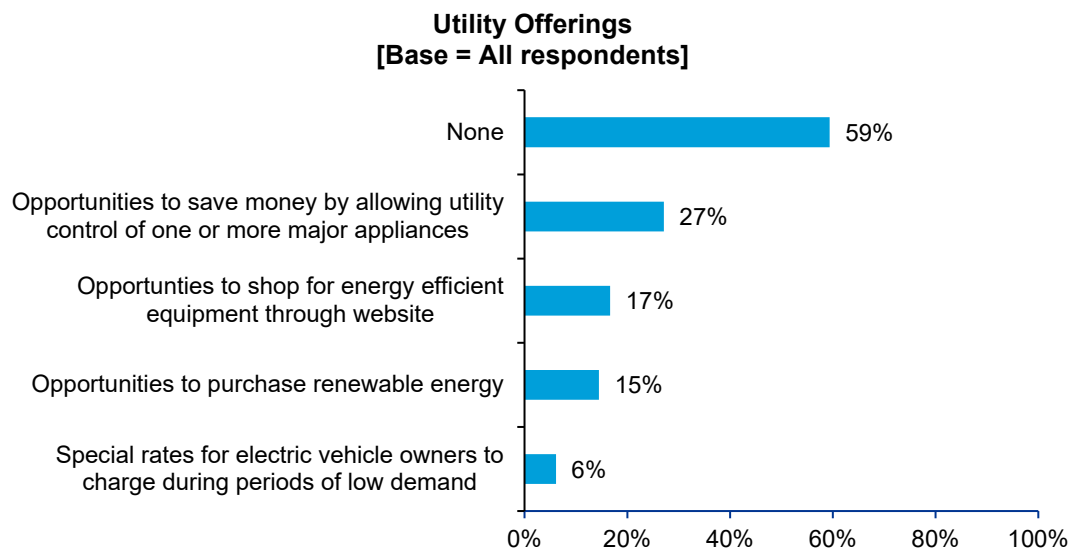
Notes: Q11: “How likely are you to recommend ENERGY STAR-labeled products to a friend?” is measured on an 11-point scale, where 0 = “Extremely unlikely” and 10 = “Extremely likely.”

\* 2022 and 2019 proportions are statistically different from each other at the 10-percent level of significance (p-value  $\leq 0.10$ ).

## 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. Estimates for all response categories were statistically similar between the 2019 and 2022 surveys.

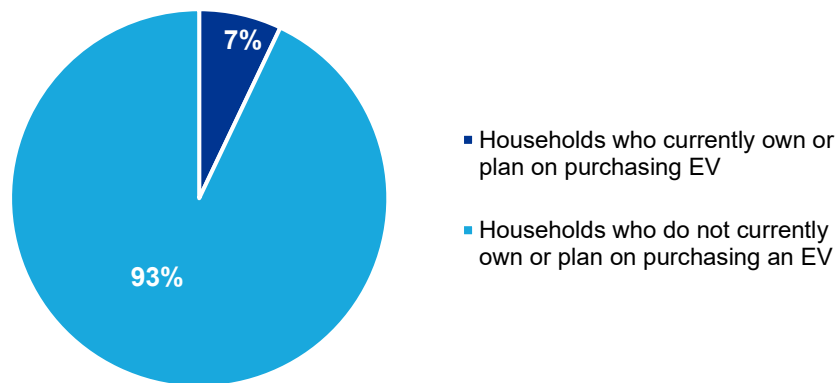




## Electric Vehicles

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?” In 2022, seven percent of households reported owning or planning to purchase an electric vehicle. This is statistically greater than the prior survey result of 5 percent (p-value = 0.0243).

**Electric Vehicle (EV) Purchasing**  
[Base = All respondents]



## APPENDIX A: DETAILED METHODOLOGY

In early December 2022, the Consortium for Energy Efficiency (CEE) fielded an Internet-based 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. In 2019, the CEE made a more substantive update to the survey instrument. These updates remained in the 2022 survey such that it was identical to the 2019 survey. 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 29 through December 9, 2022.<sup>10</sup>

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.

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<sup>10</sup> The 2019 and 2022 surveys were 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 the shifts in timeframe have an influence on results.

## **QUESTIONNAIRE DESIGN**

In 2022, CEE conducted the ENERGY STAR survey using a questionnaire designed to be delivered by Internet (mobile or desktop). The survey was conducted by Ipsos using their 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 their 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 2022 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 2022 questionnaire, CEE aimed to maintain the streamlined questionnaire used in 2019.

The 2022 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 asks 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.<sup>11</sup> Results from that timeframe were also analogous to telephone surveys for aided recognition.<sup>12</sup>

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<sup>11</sup> National Analysis of CEE 2001 ENERGY STAR Household Surveys. U.S. EPA, 2002.

<sup>12</sup> Tannenbaum, Bobbi and Shel Feldman. "ENERGY STAR Awareness as a Function of Survey Method." IEPEC, 2001.

## Determination of Aided Recognition

In the 2022 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 72 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.<sup>13</sup> 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 include in the national analysis. In 2022, no CEE members chose to oversample. A summary of the 2022 survey sample design is provided in the table starting on the next page.

The 2022 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 studies prior to 2019, 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. Beginning in 2019, CEE eliminated the publicity categorization and, as a result, 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, which includes the seven largest DMAs.
- **Stratum 2** is the second third of the population, which includes the next 16 DMAs.
- **Stratum 3** is the final third of the population, which includes DMAs ranked 24 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 surveys completed are provided in the table below. In 2022, the national sample included an additional 31 respondents beyond the required 1,000 such that the national sample is comprised of 1,031 respondents. Each respondent receives

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<sup>13</sup> Analysis included in the 2010 report showed no statistical difference for key metrics between the 57 largest DMAs and all 210 DMAs.

an appropriate weight in the analysis in order to generate valid national results and facilitate comparison with data from prior years.



### 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	7,452,620	8.6%	322	340
	2	Los Angeles	5,735,230	15.2%		
	3	Chicago	3,471,560	19.2%		
	4	Philadelphia	2,997,360	22.7%		
	5	Dallas-Ft. Worth	2,962,520	26.1%		
	6	San Francisco-Oak-San Jose	2,653,270	29.2%		
	7	Atlanta	2,648,970	32.2%		
2	8	Houston	2,569,900	35.2%	343	351
	9	Washington, DC (Hagerstown)	2,565,580	38.1%		
	10	Boston (Manchester)	2,489,620	41.0%		
	11	Phoenix (Prescott)	2,158,240	43.5%		
	12	Seattle-Tacoma	2,098,800	45.9%		
	13	Tampa-St. Pete (Sarasota)	2,035,250	48.3%		
	14	Minneapolis-St. Paul	1,887,390	50.5%		
	15	Detroit	1,862,620	52.6%		
	16	Denver	1,798,440	54.7%		
	17	Orlando-Daytona Beach-Melbourne	1,731,360	56.7%		
	18	Miami-Ft. Lauderdale	1,693,450	58.6%		
	19	Cleveland-Akron (Canton)	1,511,970	60.4%		
	20	Sacramento-Stockton-Modesto	1,459,260	62.1%		
	21	Portland, OR	1,315,470	63.6%		
	22	Charlotte	1,290,660	65.1%		
	23	St. Louis	1,239,210	66.5%		
	24	Raleigh-Durham (Fayetteville)	1,237,230	67.9%		
3	25	Indianapolis	1,182,500	69.3%	335	340
	26	Pittsburgh	1,166,130	70.6%		
	27	San Diego	1,132,300	71.9%		
	28	Baltimore	1,129,830	73.3%		
	29	Nashville	1,102,340	74.5%		
	30	Salt Lake City	1,100,260	75.8%		
	31	San Antonio	1,031,180	77.0%		
	32	Hartford & New Haven	1,002,710	78.1%		
	33	Columbus, OH	999,300	79.3%		
	34	Kansas City	986,160	80.4%		
	35	Greenville-Spartanburg-Asheville-Anderson	940,000	81.5%		
	36	Cincinnati	925,900	82.6%		
	37	Milwaukee	921,920	83.6%		
	38	Austin	912,400	84.7%		
	39	West Palm Beach-Ft. Pierce	870,720	85.7%		
	40	Las Vegas	833,510	86.7%		

Sample Stratum	DMA Rank	Designated Market Area (DMA)	Number of Households	Cumulative % of Top-57 DMAs	Target Completes	Completed Surveys
	41	Grand Rapids-Kalamazoo-Battle Creek	781,080	87.6%	1,000	1,031
	42	Harrisburg-Lancaster-Lebanon-York	772,810	88.5%		
	43	Jacksonville	756,960	89.3%		
	44	Oklahoma City	755,340	90.2%		
	45	Birmingham (Ann and Tuscaloosa)	730,440	91.0%		
	46	Norfolk-Portsmouth-Newport News	725,580	91.9%		
	47	Greensboro-High Point-Winston Salem	717,110	92.7%		
	48	Albuquerque-Santa Fe	716,800	93.5%		
	49	Louisville	696,070	94.3%		
	50	New Orleans	663,520	95.1%		
	51	Memphis	619,610	95.8%		
	52	Providence-New Bedford	619,140	96.5%		
	53	Buffalo	612,780	97.2%		
	54	Ft. Myers-Naples	608,640	97.9%		
	55	Fresno-Visalia	607,200	98.7%		
	56	Richmond-Petersburg	585,030	99.3%		
	57	Mobile-Pensacola (Ft Walt)	584,290	100.0%		
<b>Total: Largest 57 DMAs</b>			<b>86,655,540</b>	<b>NA</b>	<b>1,000</b>	<b>1,031</b>

## Weighting Procedures

Ipsos<sup>14</sup>, 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.

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<sup>14</sup> Ipsos, acquired GfK, which was the company that CEE used for surveys prior to 2019.

## DATA COLLECTION

### Survey Fielding Period

The survey began on November 29 and closed on December 9, 2022.

### Response Rate

The overall response rate was 5 percent for the CEE 2022 ENERGY STAR Household Survey. This level of response is typical for Ipsos surveys and is similar to the 6 percent response rate for the prior survey (2019).

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 2022 ENERGY STAR Household Survey, the return rate was 56 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 9 percent. Thus, the response rate for the CEE 2019 ENERGY STAR Household survey was the product of the survey-specific return rate of 56 percent and the recruitment rate of 9 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 Rate<sup>15</sup>**

Response Rate Factors	Number or % of Respondents
Sendout/requested	1,837
Completed	1,031
Return rate	56%
Recruitment rate	9%
Response rate	5%

<sup>15</sup> 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.

### **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	15.2%
Householder/respondent age	18-24	6.7%
Householder/respondent gender	Gender	0.1%
Dwelling type	Bldg. ( $\geq 2$ units)	7.6%
Own/rent	Own/rent	0.5%
Household annual income	$\geq \$75,000^a$	12.3%

<sup>a</sup>Categories are not directly comparable. Census uses \$50,000-\$79,999 and  $\geq \$80,000$ .

The largest difference (in absolute value) between the weighted survey data and national Census data is the proportion of one person households, at 15.2 percentage points. This is a substantially larger variance than the difference between 2019 weighted survey population and national Census data (3.2 percentage points), however the 2022 survey results are compared to more recent American Housing Survey data (2021 vs 2017). The proportion of households in the \$75,000 and over income category is 12.3 percentage points, the second largest difference. Third and fourth are the proportion of respondents that live in buildings with two or more units and respondents aged 18-24, at 7.6 and 6.7 percentage points respectively. 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 <sup>a</sup>	Survey Estimate Minus Census % Dwelling Units
One	28%	-15.2%
Two	34%	4.6%
Three	15%	5.4%
Four	13%	3.3%
Five or more	10%	2.0%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	128,504	

<sup>a</sup> U.S. Census Bureau, American Housing Survey, 2021.

### Age Distribution

Householder/ Respondent Age	Census % Householders <sup>a</sup>	Survey Estimate Minus Census % Householders
18-24 <sup>b</sup>	3%	6.7%
25-34	15%	2.7%
35-44	18%	0.1%
45-54	17%	-2.7%
55-64	20%	-0.5%
65 or older	27%	-6.2%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	128,504	

<sup>a</sup> U.S. Census Bureau, American Housing Survey, 2021.

<sup>b</sup> Census, under 25 years; Ipsos, 18-24 years.

### Gender Distribution

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

<sup>a</sup> U.S. Census Bureau, 2016-2020 American Community Survey 5-Year Estimates.

### Dwelling Type Distribution

Dwelling Type	Census % Dwelling Units <sup>a</sup>	Survey Estimate Minus Census % Dwelling Units
Single-family, unattached	64%	4.6%
Single-family, attached	6%	5.3%
Bldg. (>=2 units)	25%	-7.6%
Mobile home	5%	-2.3%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	128,504	

<sup>a</sup> U.S. Census Bureau, American Housing Survey, 2021.

### Own/Rent Distribution

Own/Rent	Census % Households <sup>a</sup>	Survey Estimate Minus Census % Households
Own	65%	0.5%
Rent	35%	-0.5%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	124,011	

<sup>a</sup>U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates.

### Income Distribution

Total Household Annual Income (before taxes)	Census % Households <sup>a</sup>	Survey Estimate Minus Census % Households
Less than \$15,000	9%	-3.4%
\$15,000-\$24,999	8%	-3.5%
\$25,000-\$49,999	19%	-4.0%
\$50,000-\$74,999	16%	-1.4%
\$75,000 and over	48%	12.3%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	131,202	

<sup>a</sup> U.S. Census Bureau, CPS 2021 Annual Social and Economic Supplement, Table HINC-01 Selected Characteristics of Households for All Races.



## Primary Fuel Source

Beginning in 2019, CEE modified the survey to include 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 2.4 percent, for the “Electricity” category. All other differences between the sample and Census data are (in absolute value) 2.1 percent or less.

**Primary Fuel Distribution**  
[Base = All respondents]

Primary Fuel Used to Heat Home	2022 Survey estimate	Census % Households <sup>a</sup>	Survey Estimate Minus Census % Households
Electricity	42%	40%	2.4%
Natural Gas	46%	47%	-1.9%
Propane	3%	5%	-2.1%
Fuel Oil	6%	4%	1.2%
Wood	2%	2%	0.5%
Other	2%	2%	0.0%
<b>Total (%)</b>		100%	
<b>Total (1,000s)</b>		124,011	

<sup>a</sup>U.S. Census Bureau, 2017-2021 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 preceding reports, which can be accessed via [energystar.gov/publications](http://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.

## **2019**

Substantive changes were made to the survey.

- Eliminated the rotation of an old version of the ENERGY STAR label from the recognition series.

The following questions (or question series) were removed:

- “What types of products, goods, or services do you think of when you think of the ENERGY STAR label?”
- “How strongly do you agree or disagree with the following [attitudinal statements] about ENERGY STAR-labeled products?”
- “What is your role in the household purchasing decisions?”
- Lighting bulb and fixture series: “Did you install the light bulb(s) you purchased in a light fixture?”; If yes: “What kind of bulb(s) did you purchase?”; If yes: “What kind of bulb(s) did you replace?”; and “Which kind of ENERGY STAR-labeled lighting fixture did you purchase?”
- 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?”
- 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?”

The 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 was also removed.

Four questions were added:

- To your knowledge, does your utility offer the following (select all that apply):
  - Opportunities to save money by allowing utility control of one or more major appliances 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?
- Do you or does someone in your household currently own or plan on purchasing an electric vehicle in the next 12 months?
- What is the primary fuel used to heat your home?
- For each product selected as purchased in past 12 months, respondents were asked about purchasing channel.

Finally, the product list was modified to reflect changing technologies, products currently eligible for ENERGY STAR certification, and to keep the size of the pick list manageable.

- Consolidated product groupings into 4 categories (Home appliances and lighting, Home office and electronic equipment, Heating and cooling products, Homes and building products)
- Added products (Air purifier, Cable/satellite box, Clothes dryer, Electric vehicle charger, and Pool pump)

- Altered products (“Computer or monitor” changed to “Computer, monitor, tablet or notebook;” “Thermostat” changed to “Smart thermostat;” and “Washing machine” changed to “Clothes washer”)
- Revised and consolidated products into new groupings (“Audio or video product [including DVD, Blu-ray],” “Printer, copier, scanner, or combination device” and “Window, door, skylight, or storm window”)
- Removed products (Fax machine and Roofing material)

**2022**

No substantive changes were made.

## APPENDIX D: 2022 SURVEY QUESTIONS AND FLOW CHART

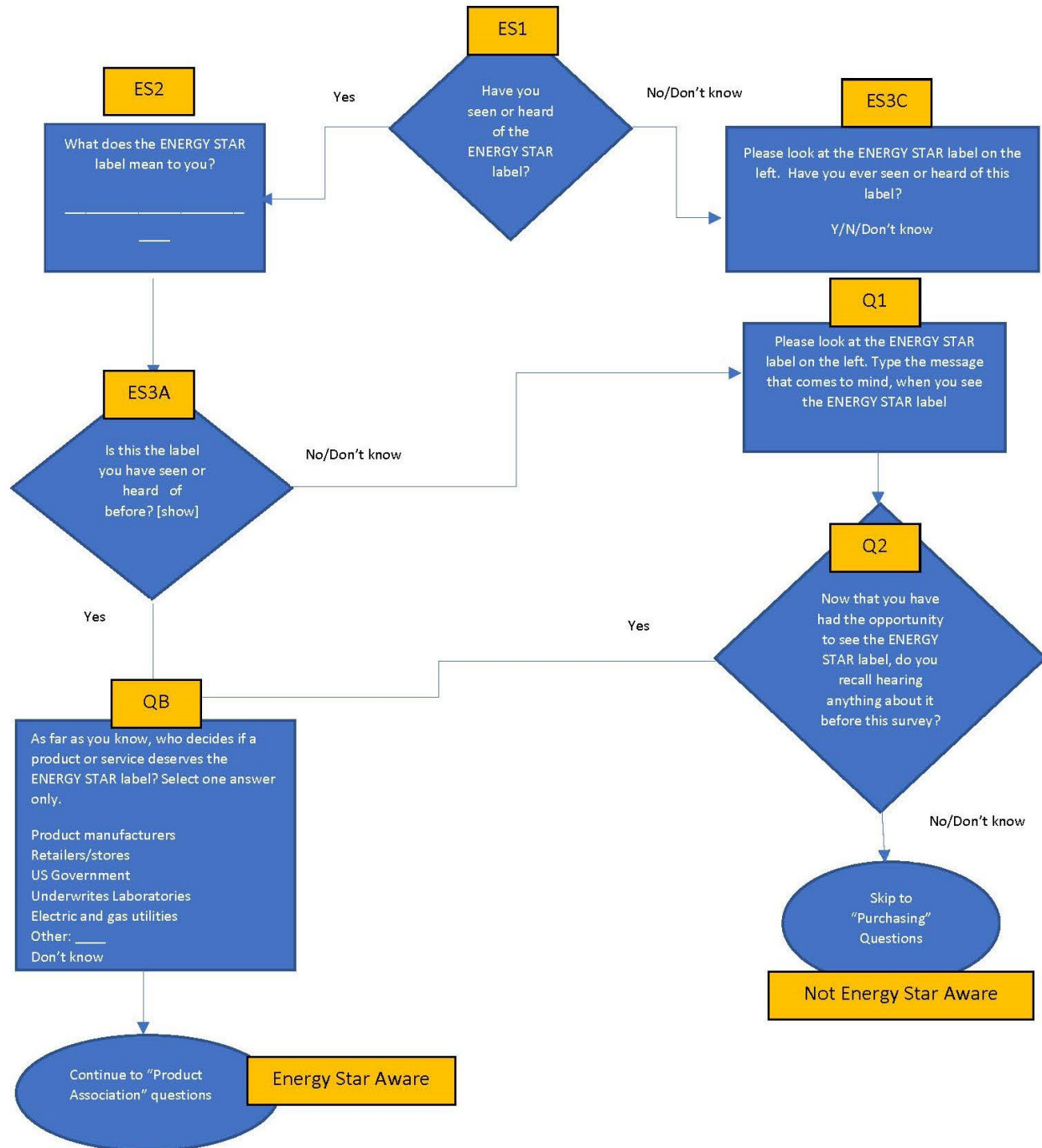


Figure 1



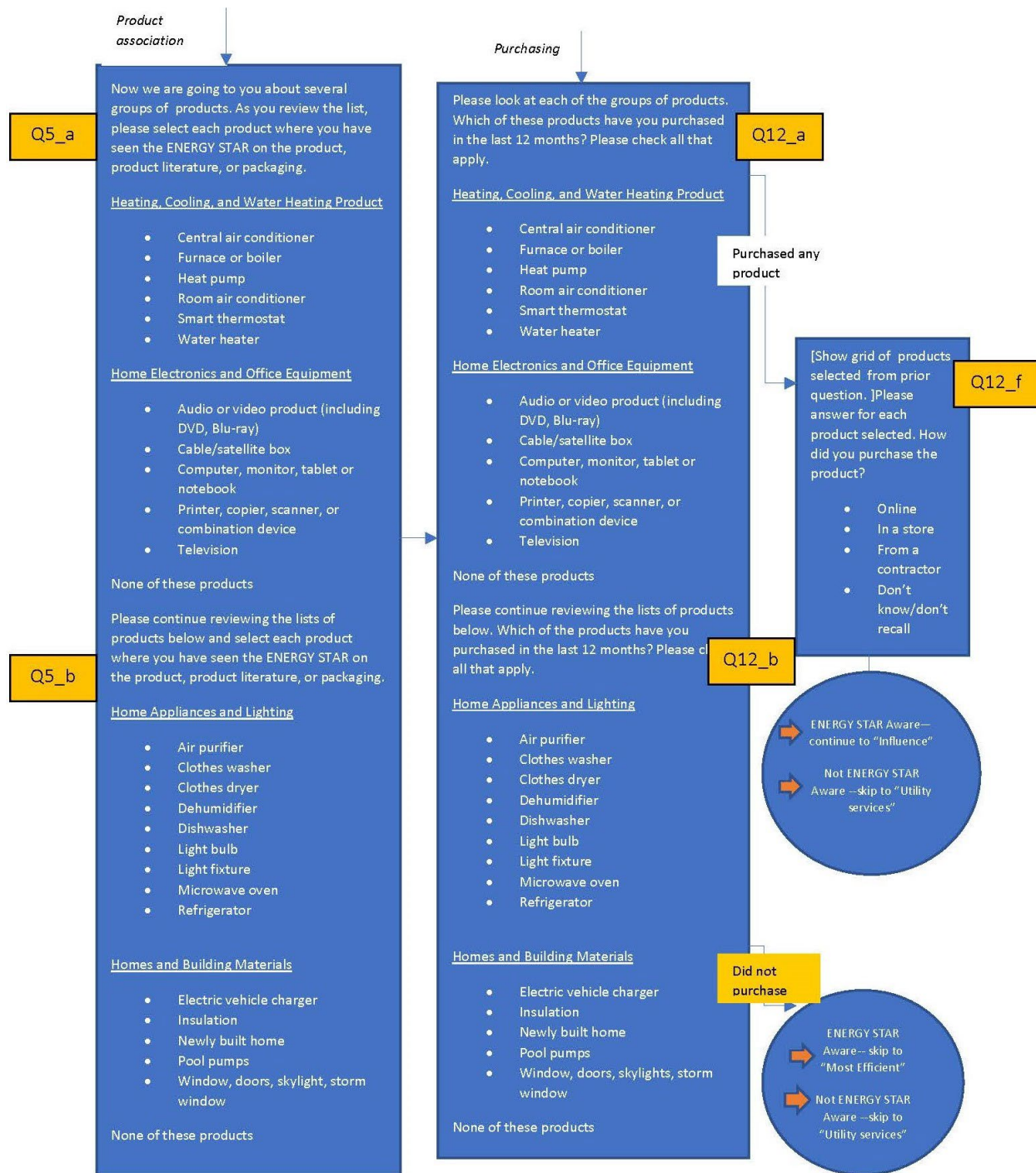


Figure 2

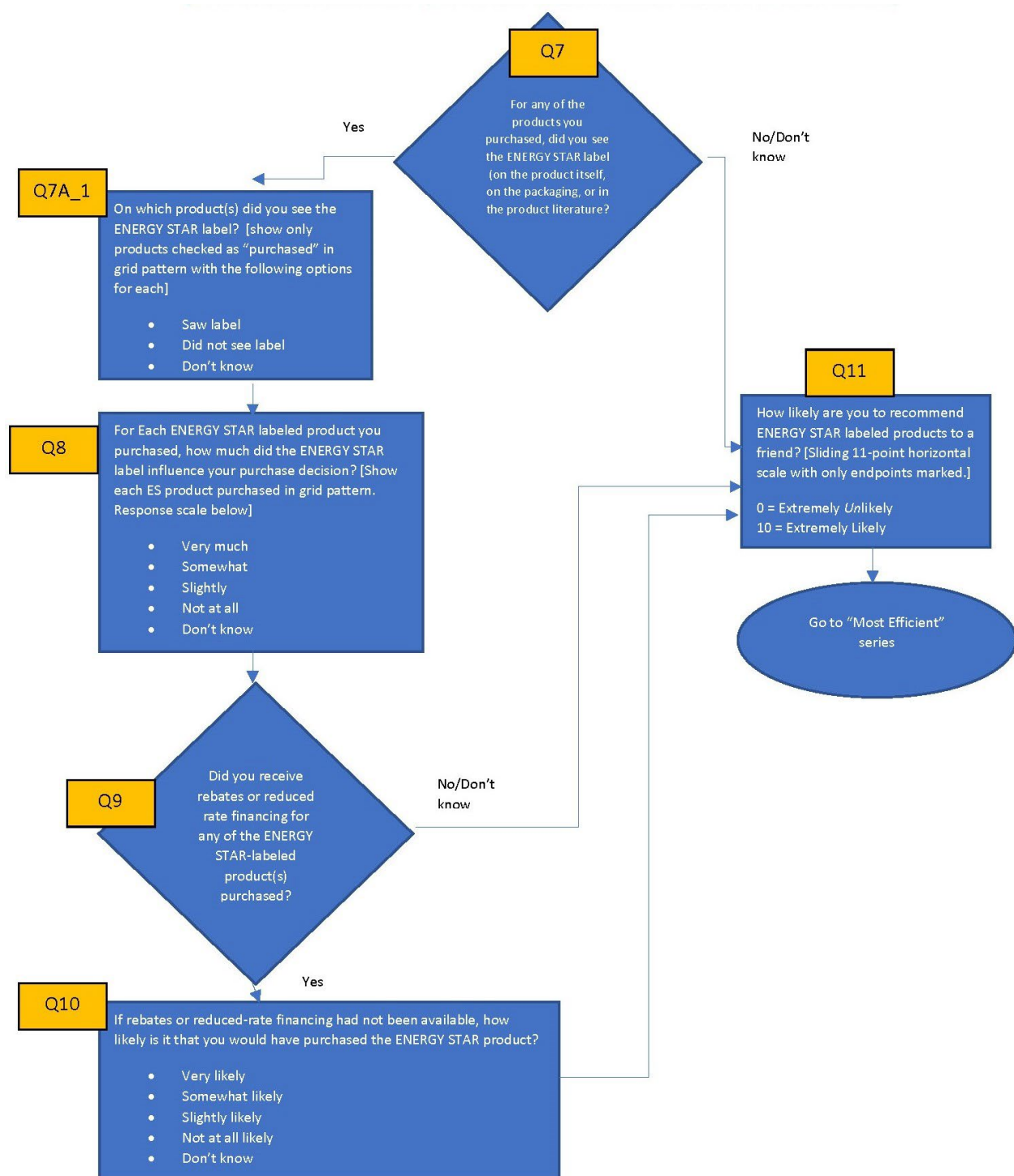


Figure 3

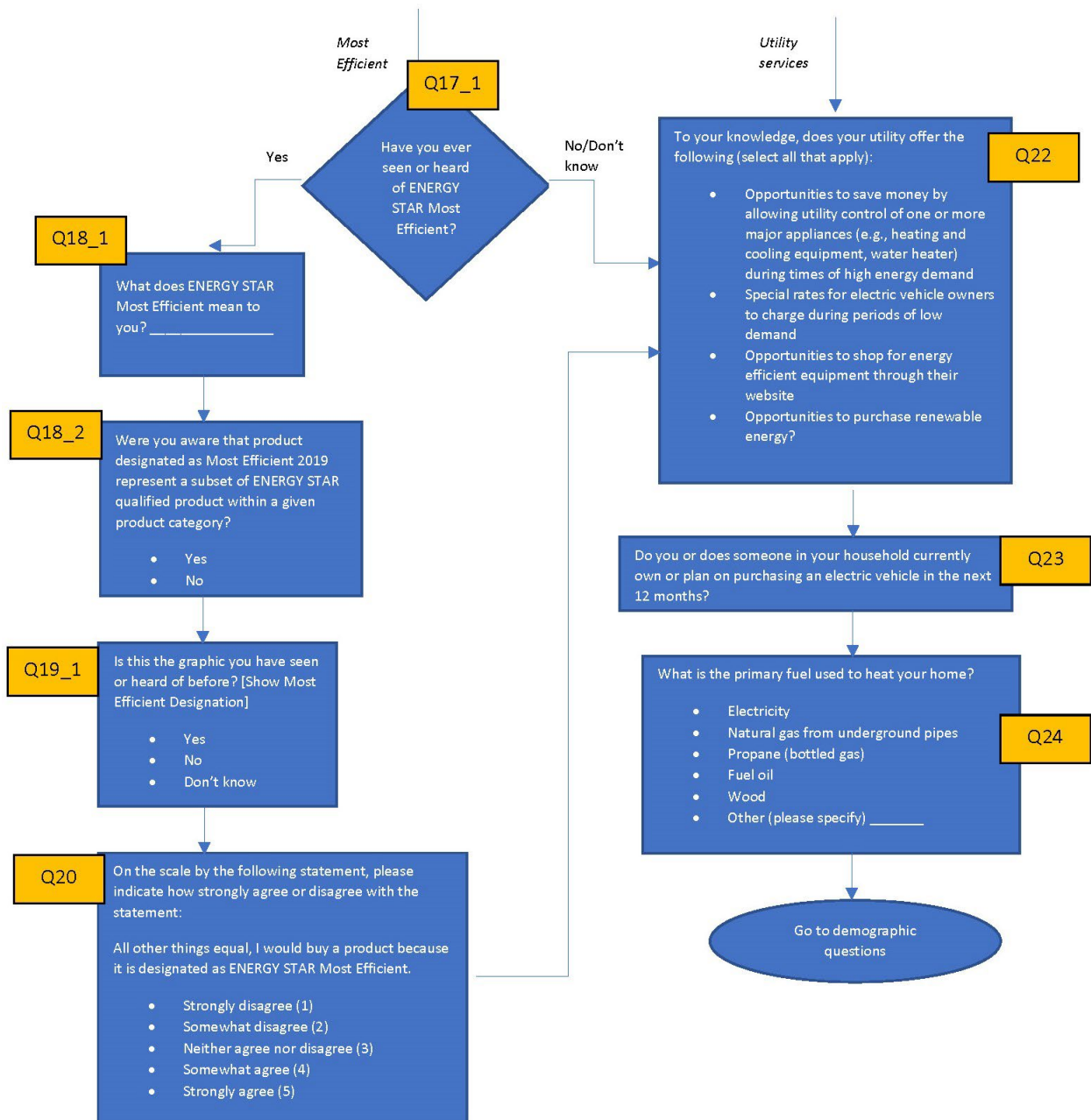


Figure 4