



ENERGY STAR

# NATIONAL AWARENESS OF ENERGY STAR® FOR 2009

## ANALYSIS OF CEE HOUSEHOLD SURVEY



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## EXECUTIVE SUMMARY

In the fall of 2009, members of the Consortium for Energy Efficiency (CEE) sponsored the tenth national household survey of consumer awareness of ENERGY STAR. Each year, the survey objectives have largely been the same: to collect national data on consumer recognition, understanding, and purchasing influence of the ENERGY STAR label, as well as data on messaging and product purchases. CEE members may choose to supplement the national sample by adding additional data points in order to assess label awareness in their local service territories. In 2009, additional surveys were conducted in the State of Wisconsin. As in all previous years, CEE and sponsoring members made the survey data available to EPA ENERGY STAR for analysis.

This report discusses the results of the CEE 2009 ENERGY STAR Household Survey, building on prior years' survey results and focusing on the extent to which consumers recognize the ENERGY STAR label, understand its intended messages, and utilize (or are influenced by) the label in their energy-related purchase decisions. Research questions of interest included:

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

### Key Findings at the National Level

- Seventy-seven percent of households recognized the ENERGY STAR label when shown the label.
- Eighty-one percent of households had a *high* or *general* understanding of the label's purpose. Furthermore, the proportion of households that demonstrated a general understanding was small compared with the proportion that demonstrated a high understanding (11 percent versus 70 percent).
- Sixty percent of households associated the ENERGY STAR label with "efficiency or energy savings."
- Of households that recognized the ENERGY STAR label (aided) and purchased a product in a relevant product category within the past 12 months, 62 percent purchased an ENERGY STAR-labeled product.
- Among all households, 33 percent knowingly purchased an ENERGY STAR-labeled product in the past 12 months.

- For 80 percent of the households that recognized the ENERGY STAR label (aided), and knowingly purchased an ENERGY STAR-labeled product, the label influenced at least one of their purchase decisions “very much” or “somewhat.” For another 7 percent of these households, the label influenced their purchase decisions “slightly.”
- Twelve percent of households that knowingly purchased an ENERGY STAR-labeled product received a financial incentive for doing so in 2009, compared to twenty-one percent in 2008. Sixty-two percent of these households report they would have been “very likely” (37 percent) or “somewhat likely” (25 percent) to purchase the labeled product without the financial incentive.
- Seventy-nine percent of households that recognized the label and purchased a product in a category where ENERGY STAR-labeled products are an option were likely to recommend ENERGY STAR-labeled products to a friend; 28 percent of these households reported that they were “extremely likely” to recommend ENERGY STAR-labeled products.

### **Key Findings from Publicity-Level Analyses**

- About the same proportion of households in high- and low-publicity areas recognized the ENERGY STAR label, both with and without being shown the label. With a visual aid, 80 percent of households in high-publicity areas recognized the label versus 77 percent in low-publicity areas; this difference is not statistically significant (p-value = 0.520). (*High-publicity areas* are defined as having a locally sponsored energy efficiency program (sponsored by a utility, state agency, or other organization) that has actively and continuously promoted ENERGY STAR for two or more years.)
- Fifty-nine percent of the households in high-publicity areas associated the ENERGY STAR label with “efficiency or energy savings,” compared with 62 percent of households in low-publicity areas. This difference is not statistically significant (p-value = 0.654).
- Considering only households that recognized the label (with a visual aid), a larger proportion of households in high- than in low-publicity areas heard or saw something about ENERGY STAR via TV and radio commercials, labels on appliances or electronics, and contractors.

## **Conclusions**

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

- Substantial portions of U.S. households in the surveyed population recognize, understand, and are influenced by the ENERGY STAR label.
- The proportion of households that exhibit only a general understanding of the label is small (11 percent) compared with the proportion of households that exhibit a high understanding (70 percent).

Unlike previous years' surveys, this study found ENERGY STAR label recognition in low-publicity areas to be quite similar to recognition in high-publicity areas.

## INTRODUCTION

In the fall of 2009, members of the Consortium for Energy Efficiency (CEE) sponsored the tenth national household survey of consumer awareness of ENERGY STAR. Each year, the survey objectives have been largely the same: to collect national data on consumer recognition, understanding, and purchasing influence of the ENERGY STAR label, as well as data on messaging and product purchases. CEE members may choose to supplement the national sample in order to assess label awareness in their local service territories. To this end, in 2009 additional surveys were conducted in the State of Wisconsin. As in the nine previous years, CEE and sponsoring members made the survey data publicly available for this analysis.

This report discusses the results of the CEE 2009 ENERGY STAR Household Survey, building on prior years' survey results and focusing on the extent to which consumers recognize the ENERGY STAR label, understand its intended messages, and utilize (or are influenced by) the label in their energy-related purchase decisions. Research questions of interest included the following:

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

The remainder of this report summarizes the survey and analysis methodology; provides key findings regarding ENERGY STAR label recognition, understanding, influence, and information sources; and contains appendices presenting detailed survey methodology (Appendix A), demographic information (Appendix B), additional questions from the 2009 survey (Appendix C), and a copy of the 2009 questionnaire (Appendix D). In all cases, the results presented in this report were weighted to obtain results applicable at the national level (please refer to Appendix A for details on the weighting methodology).

## METHODOLOGY OVERVIEW

During September 2009, CEE fielded a questionnaire to obtain information at the national level on consumer awareness of the ENERGY STAR label (please refer to Appendix A for a more detailed outline of the survey methodology). A random sample of households that are members of an Internet/WebTV panel was surveyed. Both the Internet/WebTV panel as a whole and the sample of households completing the survey were selected by random digit dial and recruited by telephone. The panel is designed to be representative of the U.S. population.

This year's questionnaire was similar to the ones CEE fielded in 2000-2008. As in previous years, CEE and its sponsoring members made the survey data publicly available.

The survey was a national survey. The sampling frame for this national survey included all households in the largest Nielsen Designated Market Areas<sup>®</sup> (DMAs) that together accounted for about 70 percent of U.S. television households. In 2009, this encompassed the 57 largest DMAs. In addition, CEE members may choose to sponsor more intensive sampling (i.e., an oversample) in selected localities, referred to here as *sponsor areas*. In 2009, the State of Wisconsin was the sole sponsor area.

Sponsor areas are not limited to the 57 largest DMAs. Thus, the complete frame for the study was the combination of the largest DMAs and any portion of the sponsor areas that fell outside the 57 largest DMAs. However, to facilitate comparisons across years, the national results were based only on data collected from respondents from the 57 largest DMAs. Data collected from respondents not in the 57 largest DMAs, but in a sponsor area, are not included in this analysis. 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 facilitate comparison with data from other years.

As in previous years' studies, the DMAs in the sampling frame were classified by publicity category, so the effect of local energy efficiency program publicity on national awareness could be considered. The same publicity classification procedure used in the past 8 years was used this year.<sup>1</sup> A DMA was classified as *high publicity*, *low publicity*, or *other* using the following criteria:

- **High publicity:** Active local ENERGY STAR promotion *recently* sponsored by a utility, state agency, or other organization for two or more continuous years. The activities must include *sustained* promotions and publicity from non-federal sources.

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<sup>1</sup> Between September 2008 and 2009, 2 of the 57 largest DMAs changed publicity category: Tampa-St. Pete (Sarasota) and Charlotte. Both changed from "Low" to "Other".

- **Low publicity:** Federal campaign activities only and no *significant* regional program sponsor activities.
- **Other:** All other DMAs.

This classification was designed to provide clear and verifiable definitions. The key working definitions are below:

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

These definitions were constructed to be sufficiently operational to be applicable to future survey efforts; they can be modified by simply increasing the duration of sustained high publicity.

The sample was stratified by area and within an area by publicity category. Each sponsor area is also further stratified by large versus non-large DMA as well as any stratification requested by the CEE member funding the oversample.<sup>2</sup> The CEE members who fund the oversample for a sponsor area determine the total number of sampling points allocated to the sponsor area as a whole. This total number of sampling points is then allocated across sponsor area strata proportional to population. Among the top 57 DMAs, for areas located outside the sponsor area, each publicity category was allocated approximately 333 sampling points.

This report presents the 2009 survey results at the national level and by publicity category. The publicity category results provide evidence of the effectiveness of EPA's model for increasing awareness, understanding, and use of ENERGY STAR by supporting regional energy efficiency program sponsors. Results are presented on consumer recognition and understanding, and purchasing influence of the ENERGY STAR label, as well as on messaging, product purchases, and information sources consumers use in their purchasing decisions.

In this report, the following terminology is used in comparing results across years or sub-categories. (1) The term "significant" implies statistical significance. In other words, differences between proportions that are described as "significant" are at least statistically different at the 10-percent level of significance. In some cases, the p-values are given to provide the exact level of statistical significance. (2) Unless stated otherwise, terms such as "smaller," "larger," "increase," or "decrease" refer to

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<sup>2</sup> The CEE member funding an oversample did not request additional stratification.

changes that are statistically significant at the 10-percent level or better. (3) The term “similar” implies that there is no statistical difference between the results being compared at the 10-percent level of significance. In other words, the difference between the results is within the bounds that would be expected from chance variation in a random sample.

## KEY FINDINGS

### RECOGNITION

In 2009, 77 percent of households recognized the ENERGY STAR label when shown the label (i.e., *aided recognition*). Sixty-four percent of households recalled seeing or hearing 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/WebTV made it possible to measure unaided recognition. Aided recognition was measured by showing respondents the ENERGY STAR label and then asking if they had seen or heard of the label. Both methods are useful measurements of label recognition, although unaided recognition is the more conservative of the two.

Recognition results for both the 2009 and 2008 surveys are summarized in the following table. The 2009 and 2008 aided and unaided recognition of the ENERGY STAR label results are not statistically different at the 10-percent level of significance. However, the increases in aided and in unaided recognition over a two-year period, 2007 to 2009, are statistically significant at the 10-percent level. Aided and unaided recognition in 2007 were 74 percent and 58 percent, respectively.

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

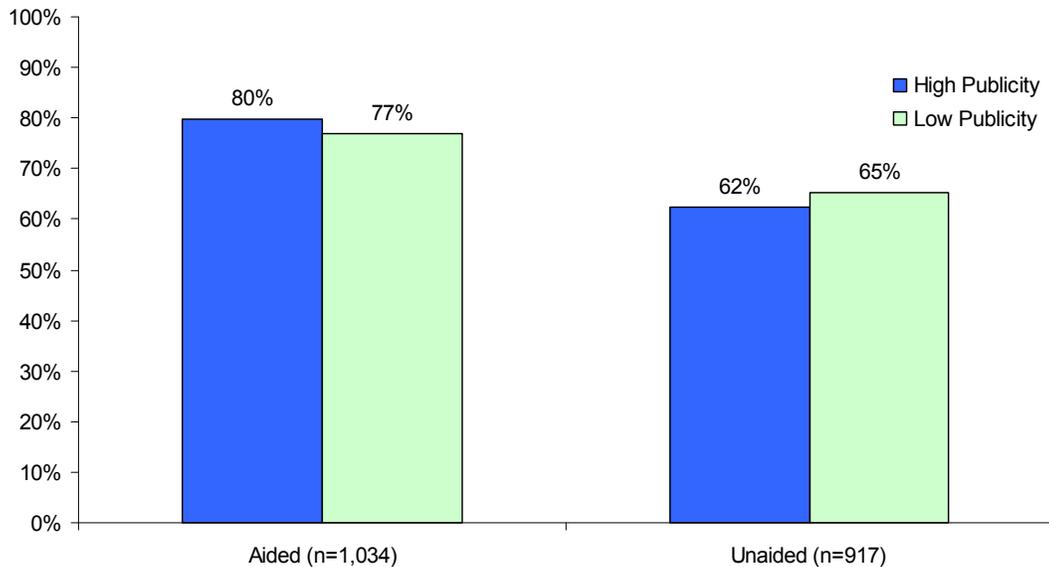
Recognize ENERGY STAR Label	2009		2008	
	Aided (n=1,034)	Unaided (n=917)	Aided (n=1,805)	Unaided (n=1,630)
Yes	77%	64%	76%	62%
Standard error	2.0%	2.4%	1.7%	2.0%

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

## Recognition by Publicity Category

In 2009, aided and unaided recognition were similar in high- and low-publicity areas. After being shown the ENERGY STAR label, 80 percent of households in high-publicity areas, and 77 percent in low-publicity areas recognized the label. Unaided recognition was 62 percent in high-publicity areas and 65 percent in low-publicity areas; this difference was not statistically significant ( $p=0.596$ ). The proportion of households in high- compared to low-publicity areas was statistically larger last year for both metrics.

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



## Product Associations

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

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

Unprompted, appliances, refrigerators and washing machines showed the strongest association with the label at 43, 33, and 31 percent, respectively. Though it does not have an ENERGY STAR specification, clothes dryers followed at 25 percent. The next most strongly associated products (unprompted) were air conditioners and dishwashers at 15 and 13 percent, respectively. These top six product associations are not significantly different from 2008 results. The list of products mentioned by households without being prompted also includes two products, in addition to clothes dryers, that do not have an ENERGY STAR specification: microwave ovens and stoves or ovens. Three products show a significant decrease in unprompted association: fans, computers and monitors, and boilers. The one product that shows a significant increase, stoves and ovens, does not have an ENERGY STAR specification.

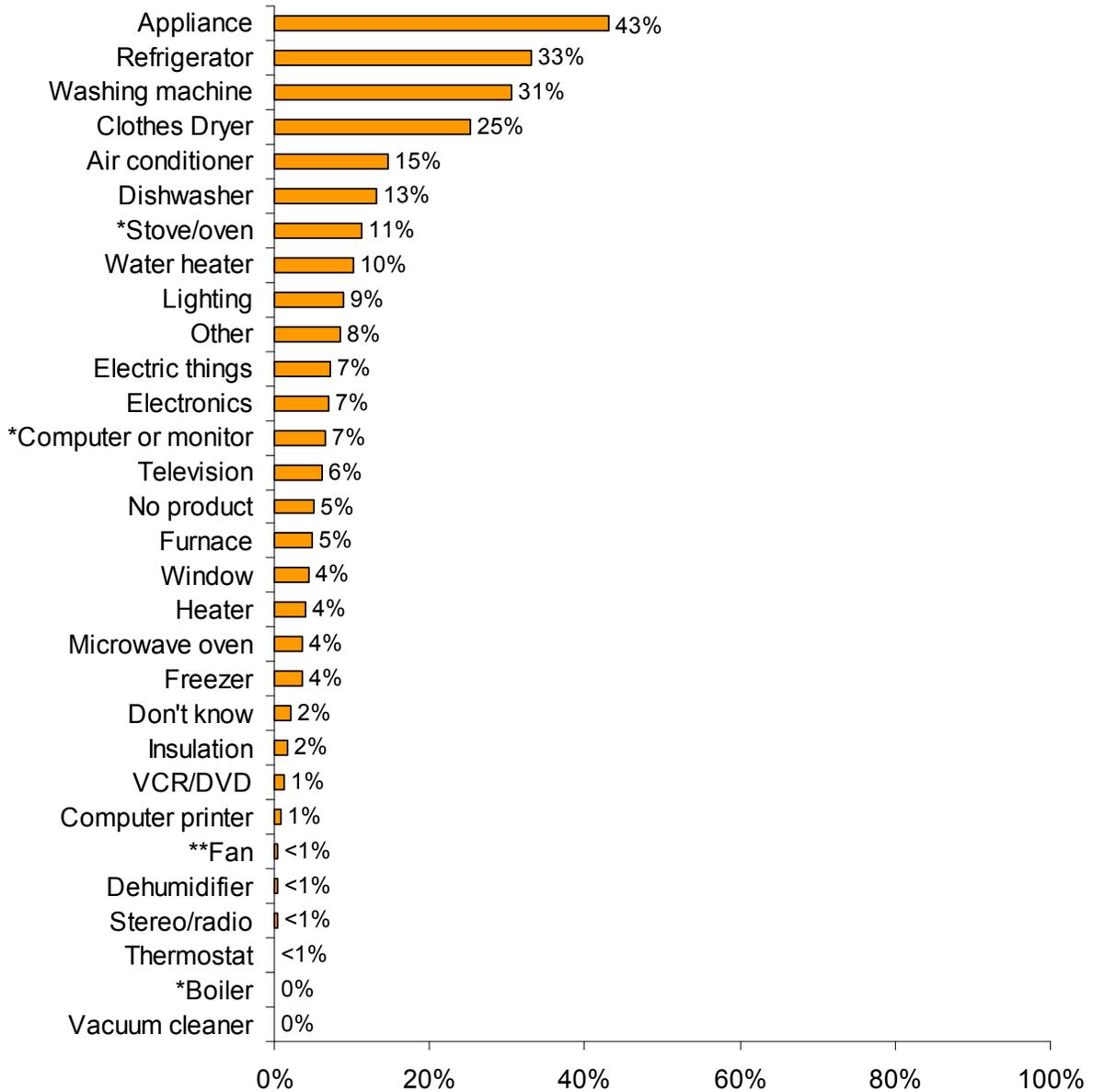
When prompted, seventy-eight percent of households had seen the label on refrigerators. Washing machines (73 percent) and dishwashers (66 percent) were the next products most commonly associated with the ENERGY STAR label. Gas water heaters, central air conditioners, and windows each followed at about 47 percent, with room air conditioners mentioned by about 41 percent. However, 36 percent of households associated microwave ovens with the ENERGY STAR label, although they do not in fact have an ENERGY STAR specification.

Four products show a significant decrease in prompted association compared to 2008: scanners, fax machines, copying machines,<sup>3</sup> and newly built homes. There were no significant increases in prompted association.

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<sup>3</sup> The across years comparison for scanners, fax machines, and copy machines may have been affected by the addition the “all-in-one printer” category in 2009.

**Unprompted Product Association with the ENERGY STAR Label**  
**[Base = Recognize label (aided), n = 676]**

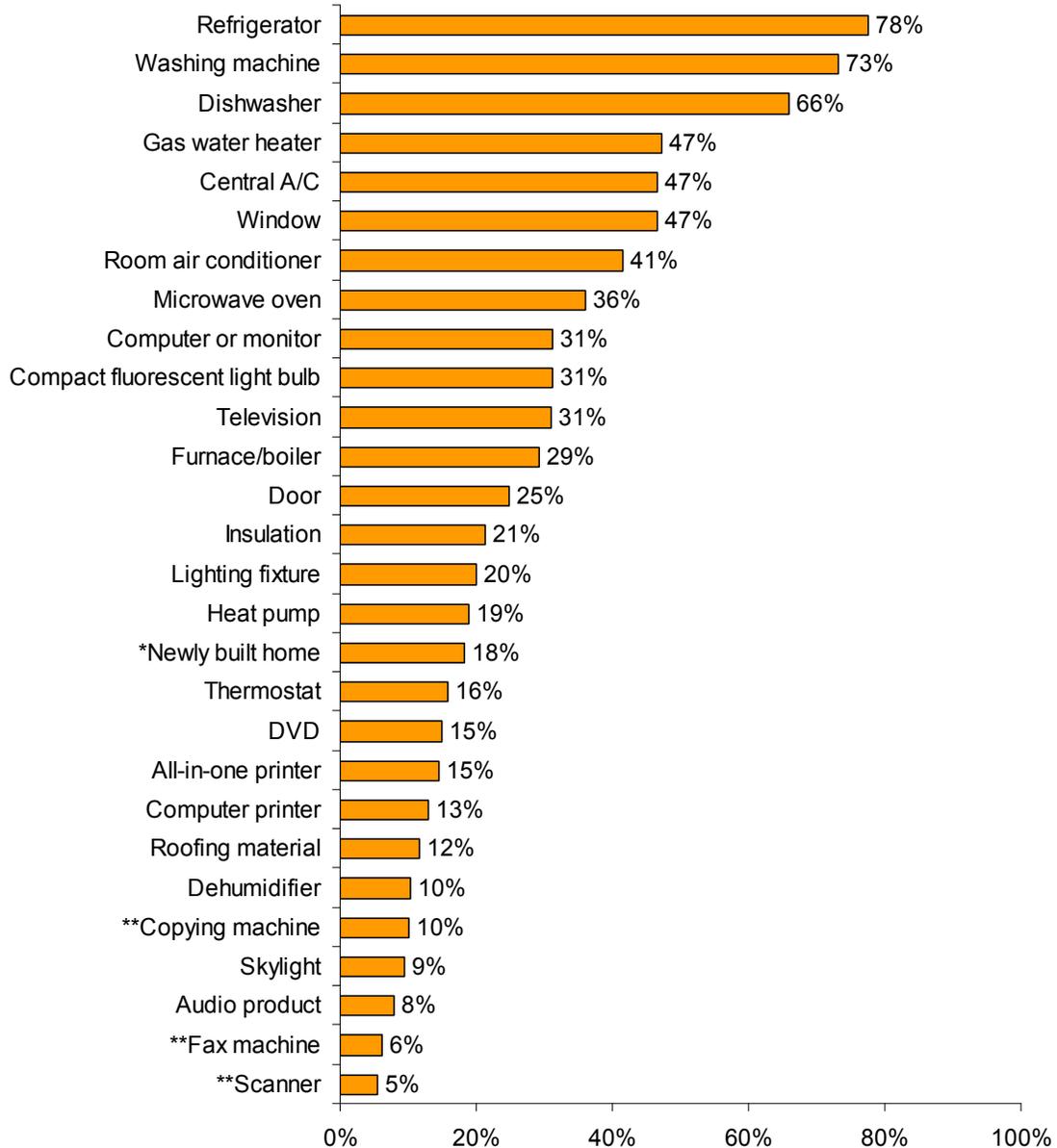


Note: QA: "What types of products, goods, or services do you think of when you think of the ENERGY STAR label? Please write your answers below."

\*\* 2009 and 2008 proportions are statistically different from each other at the 5-percent level of significance (p-value≤0.05). The proportion of households in 2009 is smaller than in 2008.

\* 2009 and 2008 proportions are statistically different from each other at the 10-percent level of significance (p-value≤0.10). The proportion of households in 2009 is smaller than in 2008 for computer or monitor, and boiler. The proportion of households in 2009 is larger than in 2008 for stove/oven.

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



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

\*\* 2009 and 2008 proportions are statistically different from each other at the 5-percent level of significance ( $p\text{-value}\leq 0.05$ ). The proportion of households in 2009 is smaller than in 2008.

\* 2009 and 2008 proportions are statistically different from each other at the 10-percent level of significance ( $p\text{-value}\leq 0.10$ ). The proportion of households in 2009 is smaller than in 2008.

<sup>4</sup> Respondents were asked about three sets of product groupings: (1) Heating and Cooling Products and Home Office Equipment, (2) Home Appliances/Lighting and Home Electronics, and (3) Building Materials and Buildings. The sample size, n, for these sets of product groupings are 703, 701 and 684 respectively

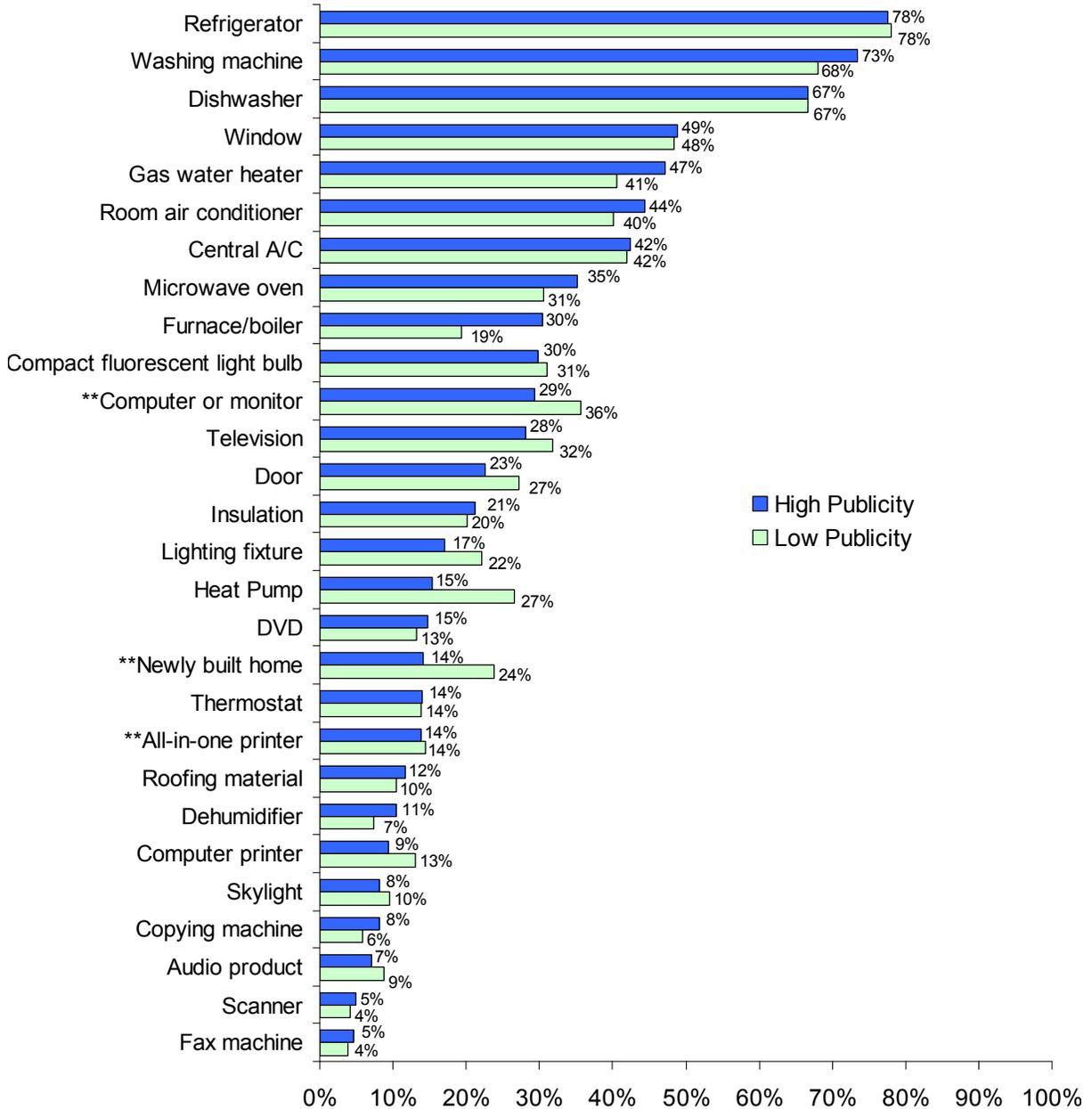
## **Product Associations by Publicity Category**

Regional energy efficiency program sponsors have traditionally focused on promoting ENERGY STAR qualified lighting, refrigerators, room air conditioners, washing machines, dishwashers, programmable thermostats, and new homes. More recently, they have begun to promote ENERGY STAR qualified water heaters and TVs in some parts of the country. In addition, some programs that have traditionally promoted ENERGY STAR appliances may have begun promoting higher levels of efficiency due to local market conditions, or discontinued promotions in anticipation of state-run ENERGY STAR appliance rebate programs being planned in response to the American Recovery and Reinvestment Act. Key findings from this year's analysis of product association by publicity category include the following:

- For furnace/boilers, a larger proportion of households in high- than low-publicity areas associated these products with the ENERGY STAR label when prompted.
- A significantly smaller proportion of households associated heat pumps and newly built homes in high- than in low-publicity areas in 2009.

The significant differences for furnace/boilers and heat pumps have been found in each of the previous 3 and 5 years, respectively. Heat pump technology is better suited and more prevalent in warmer climates. The majority of low-publicity areas are located in the southeast.

**Prompted Product Association with the ENERGY STAR Label by Publicity Category**  
**[Base = Recognize label (aided)<sup>5,6</sup>]**



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

<sup>5</sup> As discussed in footnote 4, respondents were asked about three sets of product groupings. In Heating and Cooling Products and Home Office Equipment, the sample sizes for high- and low-publicity areas are 283 and 220, respectively. For Home Appliances/Lighting and Home Electronics they are 284 and 218, and for Building Materials and Buildings they are 275 and 214.

<sup>6</sup> The percent labels on the bars are rounded to nearest whole number. Therefore bars with the same label may not appear to be the same length.

## UNDERSTANDING

In 2009, 81 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 (11 percent) was small compared with the proportion that exhibited a high understanding (70 percent). The level of understanding was investigated by asking respondents what messages came to mind when they saw the ENERGY STAR label. Based on the reported messages, a respondent's understanding was classified as *high*, *general*, or *no understanding*.

The 2009, 2008, and 2007 survey results on the level of understanding of the ENERGY STAR label are provided in the following table. There are no statistical differences between 2009 and 2008. However, the proportion of households with high understanding of the ENERGY STAR label is significantly larger in 2009 compared with 2007 (p-value = 0.045). In addition, the proportion with no understanding is significantly smaller in 2009 compared with 2007 (p-value= 0.039).

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

Level of Understanding of the Label	2009 (n=1,091)	2008 (n=1,881)	2007 (n=1,051)
High understanding **	70%	68%	65%
General understanding	11%	10%	11%
No understanding **	19%	22%	24%
<b>Total</b>	100%	100%	100%

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

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

\*\* 2009 and 2007 proportions are statistically different from each other at the 5-percent level of significance (p-value≤0.05).

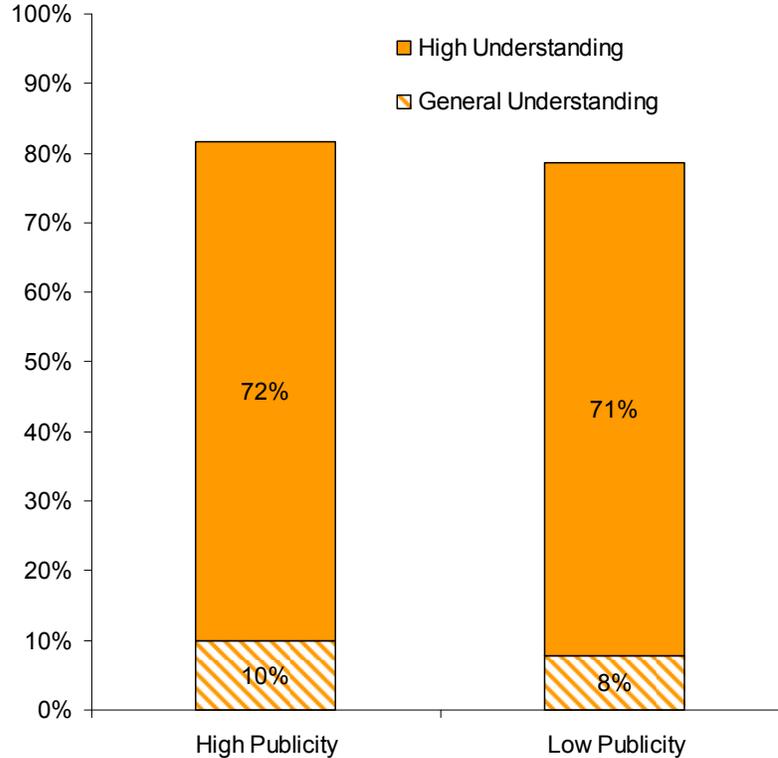
## Understanding by Publicity Category

The level of understanding of the ENERGY STAR label was similar in high- and in low-publicity areas. Eighty-two percent of households in high-publicity areas had at least a general understanding of the label compared with 79 percent of households in low-publicity areas. The difference between the publicity areas is not statistically significant at the 10-percent level. Among those households with at least a general understanding of the ENERGY STAR label, more households exhibited a high degree of understanding in both publicity categories.

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

Publicity Category	At Least General Understanding of Label
High	82%
Low	79%
<b>Difference (High minus Low)</b>	3%
<b>p-value</b>	0.459

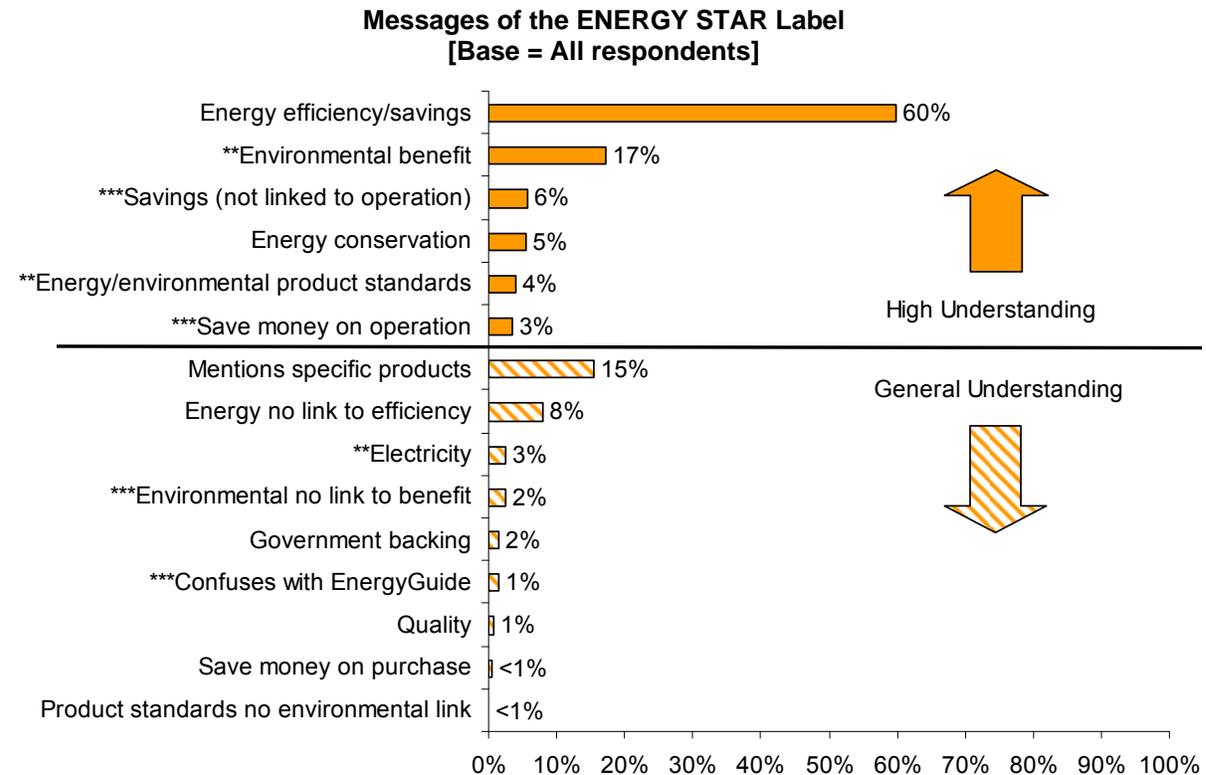
**Understanding of the ENERGY STAR Label by Publicity Category**  
 [Base = All respondents]



## Understanding of Label Messaging

Open-ended responses to the questions on the level of understanding of the ENERGY STAR label are an indicator of how effectively EPA communicates its messages through the label. These responses are used in the analysis of understanding in the previous section. By far, the most common message associated with the label was “energy efficiency or energy savings,” which is considered high understanding of the label. Sixty percent of households surveyed associated the ENERGY STAR label with this message. The second most common response was “environmental benefit” offered by 17 percent of households, which is also considered high understanding of the label.

Between 2008 and 2009 there was an increase of respondents saying “environmental benefit” and “savings (not linked to operation),” and a decrease in “confuses with EnergyGuide,” “environmental no link to benefit,” “electricity,” “save money on operation,” and “energy/environmental product standards.”

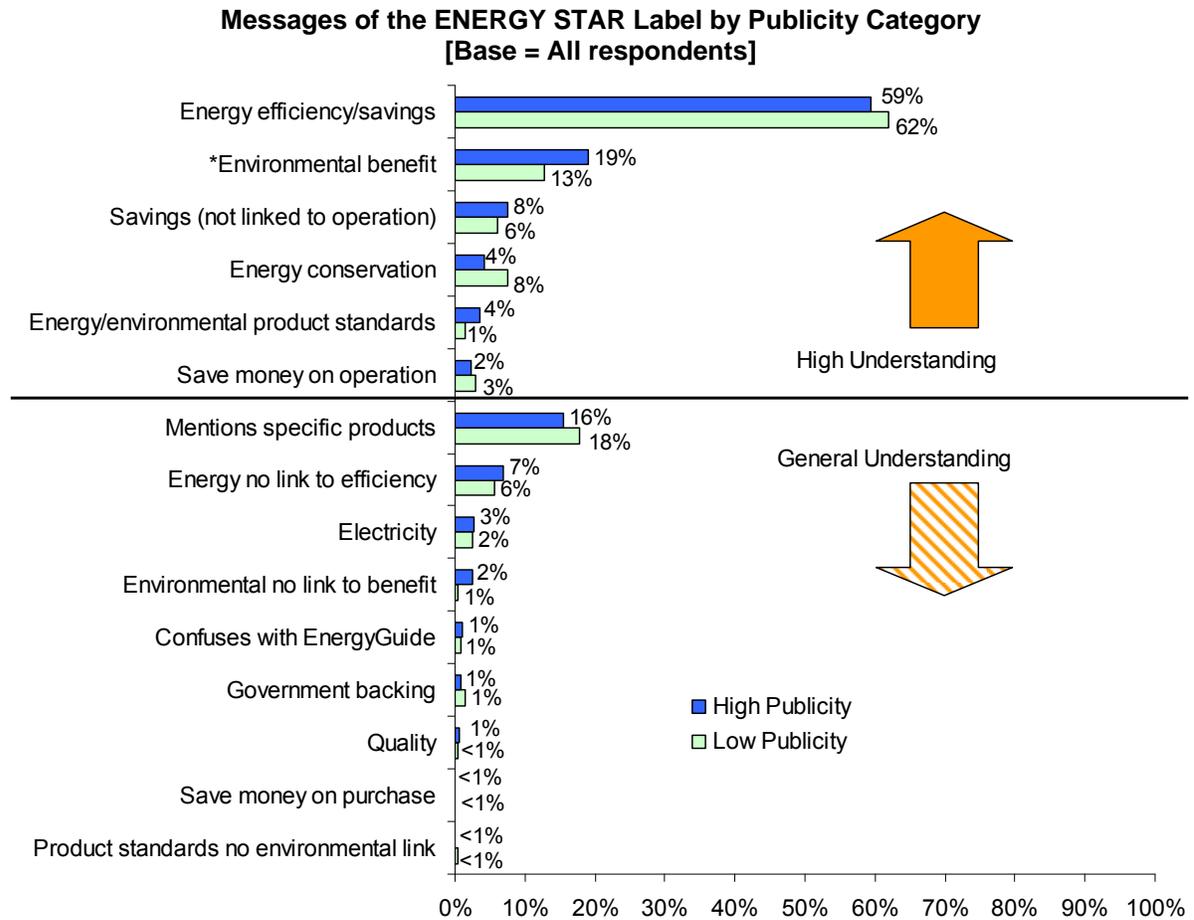


\*\*\* 2009 and 2008 proportions are statistically different from each other at the 1-percent level of significance (p-value≤0.01).

\*\* 2009 and 2008 proportions are statistically different from each other at the 5-percent level of significance (p-value≤0.05).

## Understanding of Label Messaging by Publicity Category

For most messages, the proportion of households that associated the message with the ENERGY STAR label was similar for high- and low-publicity areas. The exception is the “environmental benefit” response, a significantly larger proportion of households in high- than in low-publicity areas associated this message with the label.



\* High- and low-publicity area proportions are statistically different from each other at the 10-percent level of significance (p-values≤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 2009, 87 percent of households that recognized the ENERGY STAR label had at least a general understanding of it, while among households that did not recognize the label, 63 percent had at least a general understanding of it. Compared with 2008, these results are not statistically different at the 10-percent level.

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

Recognize ENERGY STAR Label Aided	At Least General Understanding of Label	
	2009	2008
Yes	87%	84%
No	63%	58%
<b>Difference (Yes minus No)</b>	24%	26%
<b>p-value</b>	<0.0001	<0.0001

## INFLUENCE

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

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

### Purchases of ENERGY STAR-labeled Products

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

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

The result is that 33 percent of all households knowingly purchased an ENERGY STAR product in the past twelve months. This result is statistically different (lower), at the 10-percent level, from the 2008 result.

**Purchased ENERGY STAR  
(Base = All respondents)**

<b>Purchased ENERGY STAR product</b>	<b>2009 (n=1,034)</b>	<b>2008 (n=1,805)</b>
Estimate (yes) *	33%	40%
Standard Error	2.6%	2.3%

\* 2009 and 2008 proportions are statistically different from each other at the 10-percent level of significance (p-value≤0.10).

An increase or decrease in the percent of all households that knowingly purchased an ENERGY STAR product could be due to changes in any of the three proportions listed above between 2008 and 2009. There were no statistically significant changes (at the 10-percent level) for the first two proportions, aided recognition or purchased product. However, the proportion of households who knowingly purchased an ENERGY STAR product decreased from 73 percent in 2008 to 62 percent in 2009 (p=0.010). The 2009 result is similar to the result reported in 2007, 68 percent (p=0.267).

### Purchases of ENERGY STAR by Publicity Category

The proportion of *all* households that knowingly purchased an ENERGY STAR product in high- versus low-publicity areas is 32 and 34 percent, respectively. This two percentage point difference is not significant at the 10-percent level (p-value = 0.766). The market penetration of ENERGY STAR products decreased in high publicity categories from 44 percent in 2008 to 32 percent in 2009. This difference is significant at the 5-percent level of confidence (p-value = 0.023).

**National Household Market Penetration of ENERGY STAR  
Products by Publicity Category  
[Base = All respondents]**

Publicity Category	% Households		p-value
	2009	2008	
High **	32%	44%	0.023
Low	34%	37%	0.574
<b>Difference (High minus Low)</b>	-2%	7%	
<b>p-value</b>	0.766	0.216	

\*\* 2009 and 2008 proportions are statistically different from each other at the 5-percent level of significance (p-value≤0.05).

In 2009, the differences in the three proportions used to calculate the proportion of *all* households that knowingly purchased an ENERGY STAR product are not statistically significant between high- and low-publicity areas. However the proportion of households in high-publicity areas that knowingly purchased an ENERGY STAR product decreased from 74 percent in 2008 to 56 percent in 2009. This 18 percentage point decline is significant at the 1-percent level. Other differences are suggestive, but not statistically significant at the 10-percent level.

### **Influence of the ENERGY STAR Label**

In 2009, for 80 percent of households that knowingly purchased an ENERGY STAR-labeled product, the label influenced at least one of their purchase decisions “very much” or “somewhat.” This is not statistically different from the 2008 result of 76 percent (p-value = 0.356). The percent of households influenced “somewhat” increased 10 percentage points in 2009. This is the only change from the 2008 results that is significant at the 10-percent level of confidence (p-value = 0.055).

For 7 percent of households, the label influenced their purchase decisions “slightly.” Thirteen percent of households reported the presence of the ENERGY STAR label had no influence on their purchase. These findings are not significantly different from those of 2008.

**Influence of the ENERGY STAR Label on Purchase Decisions<sup>7</sup>**  
**[Base = Recognize label (aided) and ENERGY STAR purchasers]**

<b>Influence of the Label on Purchasing Decisions</b>	<b>2009 (n=277) Maximum</b>	<b>2008 (n=506) Maximum</b>
Very much	47%	53%
Somewhat *	33%	23%
Slightly	7%	9%
Not at all	13%	15%
<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?”

\* 2009 and 2008 proportions are statistically different from each other at the 10-percent level of significance (p-value≤0.10).

<sup>7</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 Label by Publicity Category

The purchase decisions of 39 percent of households in high-publicity areas were influenced "very much" by the ENERGY STAR label, compared to 58 percent in low-publicity areas; this difference is significant at the 10-percent level. This is the first time the influence of the ENERGY STAR label was greater in low publicity areas than high. When these proportions are added to the proportions of households for which the ENERGY STAR label was "somewhat" influential in their purchasing decisions, the high- to low-publicity area comparison is 81 to 85 percent, respectively. These are not statistically different from each other at the 10-percent level of significance. There is also no statistical difference across year at the 10-percent level of significance. In 2008, the combined "very much" and "somewhat" results were 76 and 74 percent for high- and low-publicity categories, respectively.

### Influence of the ENERGY STAR Label on Purchase Decisions by Publicity Category

[Base = Recognize label (aided) and ENERGY STAR purchasers, n = 277]

Publicity Category	Very much	Very much or somewhat
High	39%	81%
Low	58%	85%
<b>Difference (High minus Low)</b>	-19%	-4%
<b>p-value</b>	0.095	0.529

## Rebate and Financing Influence

From 2008 to 2009, the percentage of households that knowingly purchased an ENERGY STAR-labeled product and received rebates or reduced-rate financing decreased from 21 percent to 12 percent. This difference is statistically significant (p-value = 0.035). Of these households in 2009, 37 percent would have been “very likely” to purchase the ENERGY STAR product if financial incentives had not been available. This decrease of 31 percentage points from the previous year is significant at the 5-percent level.

Another 25 percent would have been “somewhat likely” to purchase without a rebate. This leaves 19 percent that would have been “slightly likely” and 18 percent “not at all likely.” These three differences are not statistically significant at the 10 percent level.

**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	
	2009 (n=261)	2008 (n=471)
Yes **	12%	21%
No	88%	79%
<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	
	2009 (n=45)	2008 (n=69)
Very likely **	37%	68%
Somewhat likely	25%	22%
Slightly likely	19%	10%
Not at all likely	18%	1%
<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?”

\*\* 2009 and 2008 proportions are statistically different from each other at the 5-percent level of significance (p-value≤0.05).

## Loyalty to ENERGY STAR

Loyalty to ENERGY STAR is investigated by asking respondents who knowingly purchased an ENERGY STAR-labeled product how likely they would be to recommend ENERGY STAR products to a friend. Respondents were asked to report this likelihood on a scale of 0 to 10, where 0 means “extremely unlikely” and 10 means “extremely likely”. As can be seen in the table below, 28 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.

The likelihood of recommending ENERGY STAR products to a friend is greater than “6” for 79 percent of these households. This is consistent with the previous year’s result of 78 percent.

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

Likelihood Recommend ENERGY STAR Products	% Households	
	2009 (n=202)	2008 (n=530)
10 - Extremely likely	28%	35%
9	22%	17%
8	15%	15%
7	13%	12%
6	14%	6%
5	2%	7%
4	3%	3%
3	1%	1%
2	1%	1%
1	2%	1%
0 - Extremely unlikely	0%	2%
<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.”

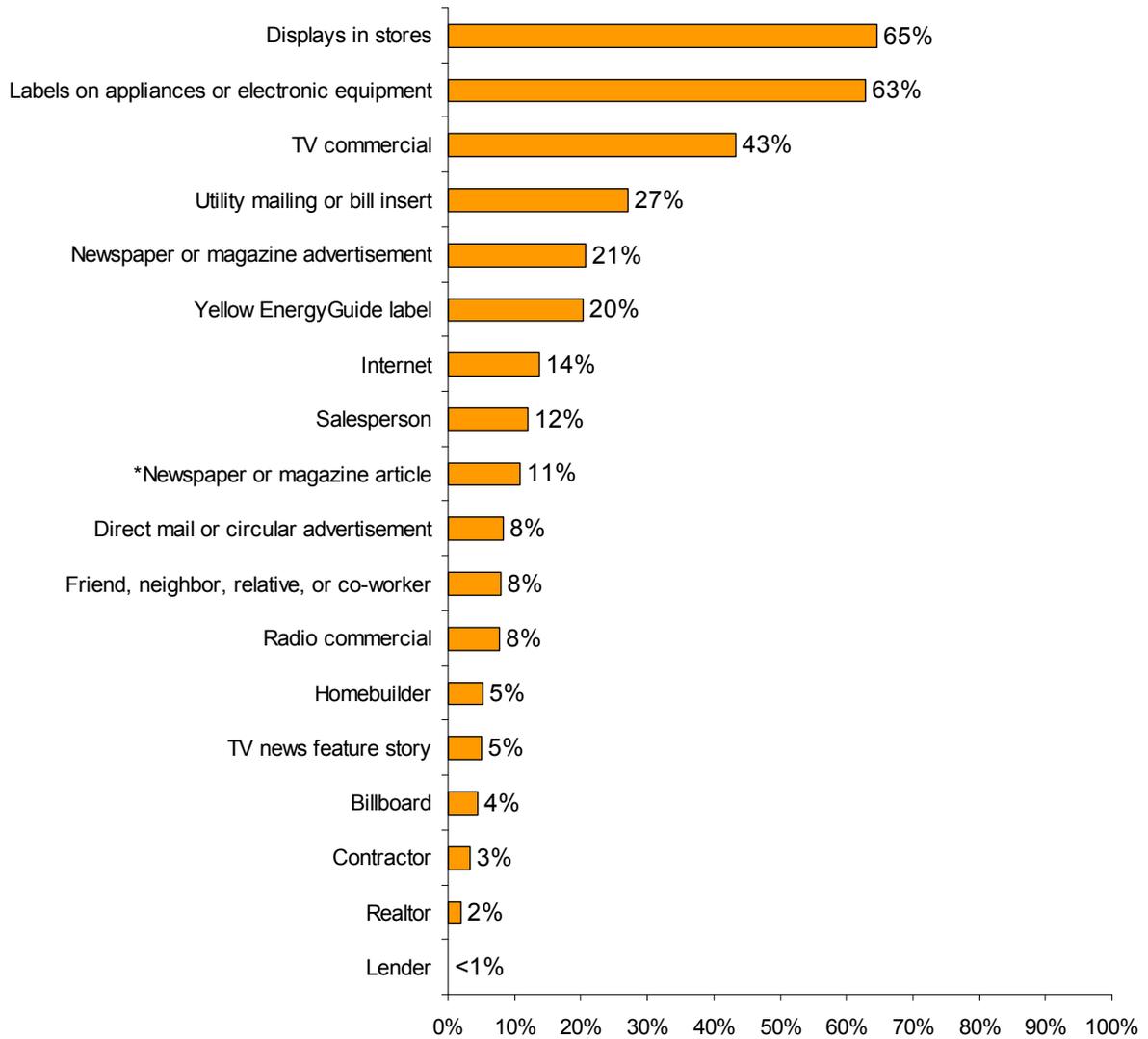
## **INFORMATION SOURCES**

### **Sources Seen**

Sixty-five percent of households have seen something about ENERGY STAR in by store displays, followed by 63 percent who mentioned seeing the label on appliances or electronic equipment. Forty-three percent of households heard or saw something about ENERGY STAR on TV commercials. Between 20 and 27 percent of households saw something about ENERGY STAR on or in utility mailings or bill inserts, EnergyGuide labels, or in newspaper or magazine advertisements.

A smaller proportion (11 percent compared to 16 percent) of households in 2009 than in 2008 saw something about ENERGY STAR in newspaper advertisements ( $p$ -value = 0.059). All other responses were statistically similar to the proportions from the 2008 survey.

**Sources Saw or Heard Something About ENERGY STAR**  
**[Base = Recognize label (aided), n = 653]**

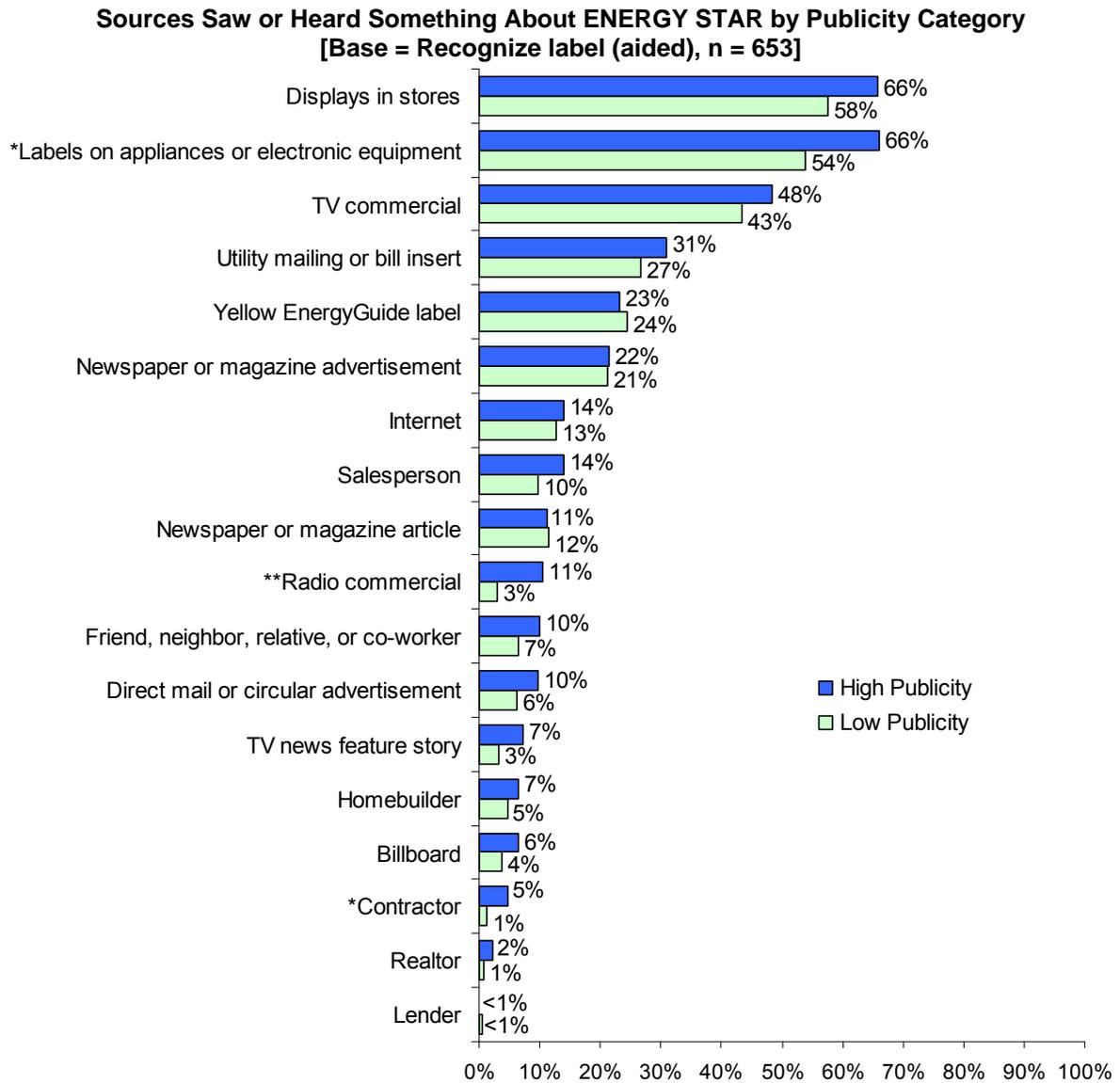


Note: SO1: "Where did you see or hear something about ENERGY STAR? Please mark all that apply."

\* 2009 and 2008 proportions are statistically different from each other at the 10-percent level of significance (p-value≤0.10). The proportion of households in 2009 is smaller than in 2008.

## Sources Seen by Publicity Category

For several information sources, the proportion of households that heard or saw something about ENERGY STAR was significantly larger in high- than in low-publicity areas. This was the case for labels on appliances and electronics, radio commercials, and contractors. Other sources of information are not significantly different between high- and low-publicity areas.



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

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

## **APPENDIX A: DETAILED METHODOLOGY**

During September 2009, the Consortium for Energy Efficiency (CEE) fielded a questionnaire to obtain information at the national level on consumer awareness and understanding of the ENERGY STAR label, the value accrued to the label in the eyes of consumers, satisfaction with labeled products, and other ENERGY STAR-related information. The questionnaire was similar to the Internet/WebTV-based questionnaires fielded in previous years (2001 through 2008). As in the nine previous years, CEE and its members sponsoring the survey made the survey data available to EPA for analysis. In 2001, a rigorous comparative analysis of the results obtained via a mail survey versus an Internet/WebTV survey was conducted. The results from the two survey methods were comparable for most major indicators.<sup>8</sup> Results from that time-frame were also analogous to telephone surveys for aided recognition.<sup>9</sup>

This report discusses the results of the 2009 CEE ENERGY STAR Household Survey, building on prior years' survey results and focusing on the extent to which consumers recognized the ENERGY STAR label, understood its intended messages, and utilized (or were influenced by) the label in their energy-related purchase decisions. Research questions of interest included:

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

The survey was fielded from September 16 through September 24, 2009.

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.

### **1 QUESTIONNAIRE DESIGN**

In 2009, CEE conducted the ENERGY STAR survey using a questionnaire designed to be delivered by Internet/WebTV. The survey was conducted via an interactive Internet/WebTV format with a random sample of households that are members of an Internet/WebTV panel. Households were selected to participate in the panel by

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<sup>8</sup> National Analysis of CEE 2001 ENERGY STAR Household Surveys. U.S. EPA, 2002.

<sup>9</sup> Tannenbaum, Bobbi and Shel Feldman. "ENERGY STAR Awareness as a Function of Survey Method." IEPEC, 2001.

random digit dial and recruited by telephone. Participants in this survey were then randomly selected from the panel. Only one member per household in the random sample was contacted. Households selected for previous years' surveys were not eligible to participate in the 2009 survey.

The panel is designed to be representative of the U.S. population. Panel members are provided with an Internet appliance (WebTV) and an Internet service connection. Households that already have Internet service receive other incentives to participate in the panel. Panel members respond to questionnaires administered to them via the Internet and WebTV. They receive no more than three to four short questionnaires each month, and are expected to respond to a certain percentage of them.

Data collected using the 2009 Internet/WebTV questionnaire may in most cases be compared with data collected using the Internet/WebTV questionnaires fielded in previous years, for which CEE was also responsible.

### **1.1 Survey Objectives**

CEE had several broad objectives in designing the 2009 questionnaire, including:

- To maintain consistency with the CEE 2000 and 2001 mail questionnaires and the Internet/WebTV questionnaires fielded in 2001 and subsequent years
- To fine-tune the questionnaire based on lessons learned from prior years' analyses of the CEE survey while maintaining the ability to analyze the results of the 2009 survey against those from the 2008 CEE survey

The 2009 Internet/WebTV questionnaire addressed the following:

- Respondent recognition and understanding of the ENERGY STAR label
- Key messages communicated by the ENERGY STAR label
- Products on which respondents have seen the ENERGY STAR label
- Products that respondents have shopped for or purchased in the past year
- Products that respondents have purchased that displayed the ENERGY STAR label on the product, packaging, or instructions
- Influence of the presence or absence of the ENERGY STAR label on the purchase decision
- Whether purchases of ENERGY STAR-labeled products involved rebates or reduced-rate financing

- Likelihood of having purchased ENERGY STAR-labeled products in the absence of rebates or reduced-rate financing
- Likelihood of recommending ENERGY STAR-labeled products to a friend and other measures of loyalty to the ENERGY STAR label
- Satisfaction with ENERGY STAR-labeled products versus products without the ENERGY STAR label
- Demographic questions (most of the demographic questions were not asked in the Internet/WebTV survey as the demographic characteristics of the respondents were already on file)
- Recognition and understanding of the yellow *EnergyGuide* labels

## 1.2 Internet/WebTV Questionnaire

The interactive format of an Internet/WebTV 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/WebTV questionnaires (after questions about the yellow *EnergyGuide* label) 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/WebTV 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/WebTV 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/WebTV questionnaire who say they have bought a given product in the past year can then be asked whether that specific product (or its packaging or instructions) had the ENERGY STAR label.

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

### 1.3 Changes to the Questionnaire

The 2009 Internet/WebTV questionnaire was very similar to the 2008 questionnaire. The 2008 questionnaire included sources of information question sequences for heating and cooling products, home appliances, lighting, and home electronics. These questions were not repeated in the 2009 survey.

In the list of products used in the 2009 instrument, two products were added (“All-in-one Printer” and “Gas water heater”) and one (“VCR”) was removed. The product lists are used for the following survey questions:

**Q5(b):** Please select each of the products, product literature, or packaging on which you have seen the ENERGY STAR label.

**Q6A:** 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?

**Q7A:** On which products did you see the ENERGY STAR label?

**Q8:** How much did the ENERGY STAR label influence your purchase decision?

**Q12(b):** Which of these products have you purchased in the last 12 months?

**QC:** In general, how satisfied are you with each of the following products you purchased?

### 1.4. Determination of Aided Recognition

In the 2009 analysis the determination of *aided* recognition was based on the responses to five questions. This is the same sequence and numbering used in the 2008 survey. Specifically:

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

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

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

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

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

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

## 2 SAMPLING

### 2.1 Designated Marketing Areas' Publicity Categories

The same publicity classification procedure used in the past 9 years was used in 2009. A Nielsen Designated Marketing Area<sup>®</sup> (DMA) was classified as *high publicity*, *low publicity*, or *other* using the following criteria:

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

This classification procedure was designed to identify three publicity categories and provide clear and verifiable definitions. The key working definitions are:

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

These definitions were constructed to be applicable to future survey efforts; they can be modified by simply increasing the duration of sustained high publicity.

### 2.2 Sample Design

The survey was a national survey. The sampling frame for this national survey included all households in the largest Nielsen Designated Market Areas<sup>®</sup> (DMAs) that together accounted for about 70 percent of U.S. television households. In 2009, this encompassed the 57 largest DMAs. In addition, CEE members may choose to sponsor more intensive sampling (i.e., an oversample) in selected localities, referred to here as *sponsor areas*. In 2009, the State of Wisconsin was the sole sponsor area.

Sponsor areas are not limited to the 57 largest DMAs. Thus, the complete frame for the study was the combination of the largest DMAs and any portion of the sponsor areas that fell outside the 57 largest DMAs.

To facilitate comparisons across years, the national results were based only on data collected from respondents from the 57 largest DMAs. Data collected from respondents not in the 57 largest DMAs, but in a sponsor area, are not included in this analysis. 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 facilitate comparison with data from other years.

The sample was stratified by area and within an area by publicity category. Each sponsor area is also further stratified by large versus non-large DMA as well as any stratification requested by the CEE member funding the oversample.<sup>10</sup> The CEE members who fund the oversample for a sponsor area determine the total number of sampling points allocated to the sponsor area as a whole. This total number of sampling points is then allocated across sponsor area strata proportional to population. Among the top 57 DMAs, for areas located outside the sponsor area, each publicity category was allocated approximately 333 sampling points. In order to achieve the target number of sampling points, a larger sample was selected to receive the survey to allow for non-response.

A list of the large DMAs and their publicity category assignments is provided in the table below.<sup>11</sup> A list of the DMAs included in the sponsor area and their publicity category assignments follows. Lastly, the large DMAs and the DMAs in the sponsor areas are shown on a map along with their publicity categories.

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<sup>10</sup> No CEE member funding an oversample requested additional stratification.

<sup>11</sup> Between September 2008 and 2009, 2 of the 57 largest DMAs changed publicity category: Tampa-St. Pete (Sarasota) and Charlotte. Both changed from "Low" to "Other".

**Large (Top 57) DMAs**

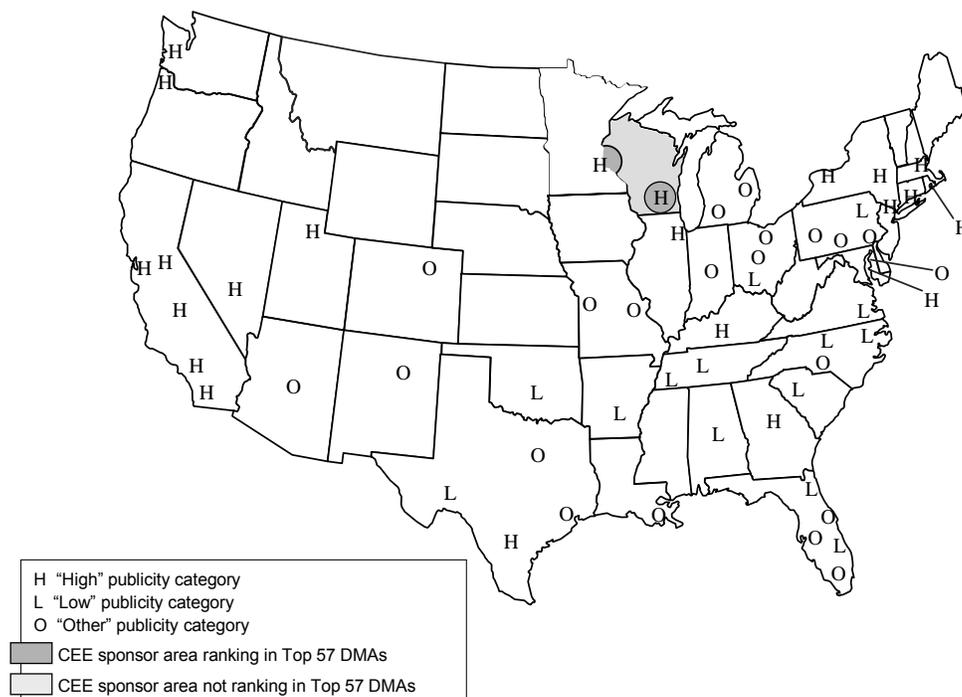
Rank	Designated Market Area (DMA)	TV Households 2008-2009		Publicity Category
		Number	% of US	
1	New York	7,433,820	6.495	High
2	Los Angeles	5,654,260	4.940	High
3	Chicago	3,492,850	3.052	High
4	Philadelphia	2,950,220	2.578	Other
5	Dallas-Ft. Worth	2,489,970	2.175	Other
6	San Francisco-Oak-San Jose	2,476,450	2.164	High
7	Boston (Manchester)	2,409,080	2.105	High
8	Atlanta	2,369,780	2.070	High
9	Washington, DC (Hagrstwn)	2,321,610	2.028	High
10	Houston	2,106,210	1.840	Other
11	Detroit	1,926,970	1.684	Other
12	Phoenix (Prescott)	1,855,930	1.622	High
13	Tampa-St. Pete (Sarasota)	1,822,160	1.592	Other
14	Seattle-Tacoma	1,819,970	1.590	High
15	Minneapolis-St. Paul	1,730,530	1.512	High
16	Miami-Ft. Lauderdale	1,546,920	1.352	Other
17	Cleveland-Akron (Canton)	1,524,930	1.332	Other
18	Denver	1,524,210	1.332	Other
19	Orlando-Daytona Bch-Melbrn	1,466,420	1.281	Other
20	Sacramnto-Stkton-Modesto	1,399,520	1.223	High
21	St. Louis	1,249,820	1.092	Other
22	Portland, OR	1,175,100	1.027	High
23	Pittsburgh	1,156,460	1.010	Other
24	Charlotte	1,122,860	0.981	Other
25	Indianapolis	1,114,970	0.974	Other
26	Baltimore	1,102,080	0.963	Other
27	Raleigh-Durham (Fayetvll)	1,080,680	0.944	Low
28	San Diego	1,066,680	0.932	High
29	Nashville	1,016,290	0.888	Low
30	Hartford & New Haven	1,014,990	0.887	High
31	Kansas City	937,970	0.819	Other
32	Columbus, OH	925,840	0.809	Other
33	Salt Lake City	919,390	0.803	High
34	Cincinnati	915,570	0.800	Low
35	Milwaukee	905,350	0.791	High
36	Greenvll-Spart-Ashevll-And	858,050	0.750	Low
37	San Antonio	818,560	0.715	Low
38	West Palm Beach-Ft. Pierce	779,430	0.681	Low
39	Grand Rapids-Kalmzoo-B.Crk	741,420	0.648	Other
40	Birmingham (Ann, Tusc)	739,750	0.646	Low
41	Harrisburg-Lncstr-Leb-York	738,880	0.646	Other
42	Las Vegas	728,410	0.636	High
43	Norfolk-Portsmth-Newpt Nws	718,020	0.627	Low
44	Albuquerque-Santa Fe	689,120	0.602	Other
45	Oklahoma City	687,300	0.600	Low

Rank	Designated Market Area (DMA)	TV Households 2008-2009		Publicity Category
		Number	% of US	
46	Greensboro-H.Point-W.Salem	685,110	0.599	Low
47	Jacksonville	674,860	0.590	Low
48	Memphis	673,770	0.589	Low
49	Austin	667,670	0.583	High
50	Louisville	667,230	0.583	High
51	Buffalo	631,120	0.551	High
52	Providence-New Bedford	622,580	0.544	High
53	New Orleans	602,740	0.527	Other
54	Wilkes Barre-Scranton	594,570	0.519	Low
55	Fresno-Visalia	574,900	0.502	High
56	Little Rock-Pine Bluff	567,060	0.495	Low
57	Albany-Schenectady-Troy	556,750	0.486	High
<b>Total</b>		81,043,160	70.807	

#### Sponsor Areas

Sponsor Area	Publicity Category	DMA (Large and Small)
Wisconsin	High	Large: all * Milwaukee (Rank 35) Small: all * Madison (Rank 85) * Wausau-Rhineland (Rank 135) Large: partial * Minneapolis-St. Paul (rank 15) Small: partial * Green Bay - Appleton (Rank 70) * Cedar Rapids-Waterloo (Rank 88) * Duluth-Superior (Rank 139) * Marquette (Rank 180)

## Large (Top 57) DMAs and Sponsor Areas by Publicity Category<sup>12</sup>



### 2.3 Weighting Procedures

Knowledge Networks, the company that provided the Internet/WebTV survey service, developed the weights used in the analysis. Knowledge Networks 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 Internet/WebTV panel and the U.S. population. The adjustment to this typical sampling weight approach was based on geographic and demographic characteristics known for both the panel and the population (refer to Appendix B). It effectively scales up under-represented population dimensions in the panel and scales down dimensions that are over-represented in the panel. This more closely aligned the panel with the basic demographic characteristics of the U.S. population.

<sup>12</sup> There were no large DMAs or sponsor areas in either Alaska or Hawaii.

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

### 3 DATA COLLECTION

#### 3.1 Survey Fielding Period

The survey began on September 16 and closed on September 24, 2009.

#### 3.2 Response Rate

The overall response rate was 13 percent for the CEE 2009 ENERGY STAR Household Survey. This level of response is typical for Knowledge Networks' surveys.

For an Internet/WebTV 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 2009 ENERGY STAR Household Survey, the return rate was 60 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 Internet/WebTV panel as a proportion of the number of households asked to participate. The recruitment rate was 21 percent. Thus, the response rate for the CEE 2009 ENERGY STAR Household survey was the product of the survey-specific return rate of 60 percent and the recruitment rate of 21 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.

**Survey Response Rate**

Sendout/requested	1,812
Completed	1,090
Return rate	60%
Recruitment rate	21%
Response rate	13%

## **4 NATIONAL ANALYSIS**

### **4.1 DMAs Included**

To facilitate comparisons across years, the national results were based only on data collected from respondents from the 57 largest DMAs. Data collected from respondents not in the 57 largest DMAs, but in a sponsor area, are not included in this analysis. 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.

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

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

## APPENDIX B: DEMOGRAPHICS

This appendix presents the relationship between the demographic characteristics found in the weighted survey data and the corresponding characteristics in the study population of all U.S. households. Professional survey and data collection firms make significant efforts to ensure the rigor of their methods and to produce the highest quality results. Each year, Knowledge Networks—the company that maintains the Internet/WebTV 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 Internet/WebTV 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/WebTV 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
Householder/respondent age	18-24	6.6%
Householder/respondent gender	Gender	+/- 1.0%
Dwelling type	Single-family, attached	3.5%
Own/rent	Own/rent	+/- 2.2%
Household annual income	\$75,000 and over	-3.8%

The largest differences (in absolute value) between the weighted survey data and national Census data, at between six and seven percentage points, are the number of persons in the household, and the proportion of households 18-24 years of age. The difference in the proportion of households in the highest income category is the next largest, at almost four percentage points, and the number of single-family attached residences at 3.5 percentage points. The combined over-representation of 18-24 years of age households and under-representation of single-person households, are not expected to bias the survey results in any particular direction. Differences between the weighted survey data and Census data for other demographic characteristics of the population—own/rent, and gender—are all quite small, at less than about three percentage points.

### Household Size Distribution

Number of Persons in Household 2009	Census % Dwelling Units <sup>a</sup>	Survey Estimate Minus Census % Dwelling Units
One	27%	-6.7%
Two	33%	-0.1%
Three	16%	2.5%
Four	14%	0.8%
Five or more	10%	3.5%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	110,691	

<sup>a</sup> U.S. Census Bureau, American Housing Survey, 2007, Table 2-9.

### Age Distribution

Householder/ Respondent Age 2009	Census % Householders <sup>a</sup>	Survey Estimate Minus Census % Householders
18-24 <sup>b</sup>	6%	6.6%
25-34	17%	-1.2%
35-44	20%	0.9%
45-54	21%	-3.3%
55-64	16%	3.1%
65 or older	21%	-6.0%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	110,693	

<sup>a</sup> U.S. Census Bureau, American Housing Survey, 2007, Table 2-9.

<sup>b</sup> Census, Under 25 years; WebTV/Internet, 18-24 years.

### Gender Distribution

Householder/ Respondent Gender 2009	Census % Population <sup>a</sup>	Survey Estimate Minus Census % Population
Female	51%	1.0%
Male	49%	-1.0%
<b>Total (%)</b>	100%	

<sup>a</sup> U.S. Census Bureau, The Population Profile of the United States: Dynamic Version, Part I: Population Dynamics, Age and Sex Distribution in 2005.

### Dwelling Type Distribution

Dwelling Type 2009	Census % Dwelling Units <sup>a</sup>	Survey Estimate Minus Census % Dwelling Units
Single-family, unattached	65%	-0.1%
Single-family, attached	5%	3.5%
Bldg. (>=2 units)	24%	-2.4%
Mobile home	6%	-1.0%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	126,238	

<sup>a</sup> U.S. Census Bureau, American Housing Survey, 2007, Table 2-1.

### Own/Rent Distribution

Own/Rent 2009	Census % Households <sup>a</sup>	Survey Estimate Minus Census % Households
Own	68%	2.2%
Rent	32%	-2.2%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	110,692	

<sup>a</sup> U.S. Census Bureau, American Housing Survey, 2007, Table 2-1.

### Income Distribution

Total Household Annual Income (before taxes) 2009	Census % Households <sup>a</sup>	Survey Estimate Minus Census % Households
Less than \$15,000	13%	-2.5%
\$15,000-\$24,999	12%	1.0%
\$25,000-\$49,999	25%	2.6%
\$50,000-\$74,999 <sup>b</sup>	18%	2.8%
\$75,000 and over <sup>b</sup>	32%	-3.8%
<b>Total (%)</b>	100%	
<b>Total (1,000s)</b>	117,181	

<sup>a</sup> U.S. Census Bureau, CPS Annual Demographic Survey March Supplement, Table HINC-01 Selected Characteristics of Households, by Total Money Income in 2008

<sup>b</sup> Census, \$50,000-\$80,000 and \$80,000 and over.

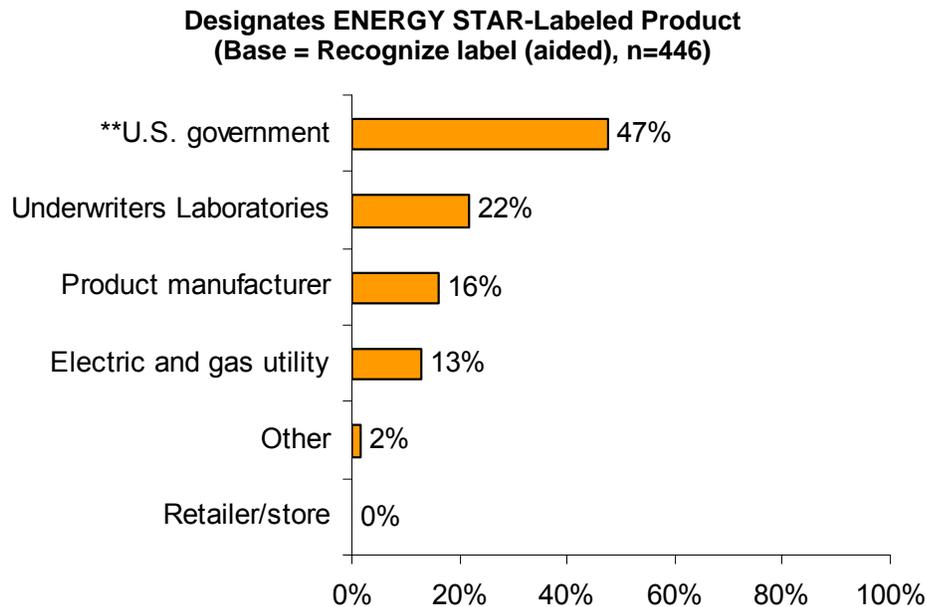
## APPENDIX C: ADDITIONAL QUESTIONS FROM 2009 SURVEY

This appendix presents the results of additional ENERGY STAR-related questions in the 2009 survey that were added by CEE since 2005; and were not discussed in the main body of the report. Topics included in this appendix include:

- ENERGY STAR Designation
- ENERGY STAR Product Satisfaction
- Consumer Perceptions
- Purchasing Decisions
- CFL Purchaser Questions

### 1 ENERGY STAR DESIGNATION

Forty-seven percent of households that recognized the ENERGY STAR label (aided) thought that the U.S. government decides if a product deserves the label. This is nine percentage points larger than the proportion noted in 2008. The difference is significant at the 5-percent level. Twenty-two percent of households thought the Underwriters Laboratories makes this decision, while 16 percent thought product manufacturers make the decision. 13 percent thought electric and gas utilities make the decision, 2 percent thought other entities make the decision, and 0 percent thought retailers/stores make the decision.



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

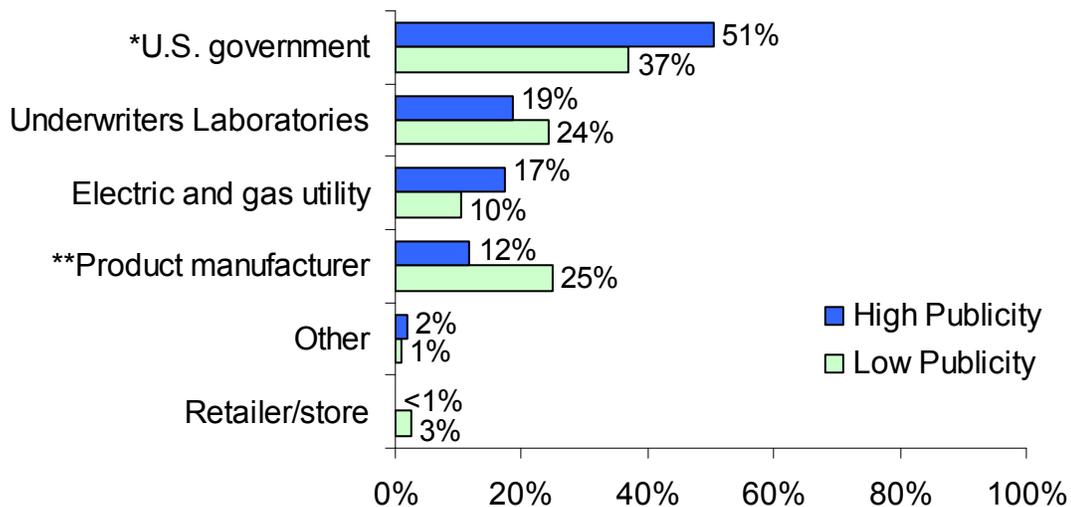
\*\* 2009 and 2008 proportions are statistically different from each other at the 5-percent level of significance ( $p\text{-value} \leq 0.05$ ).

## ENERGY STAR Designation by Publicity Category

In 2009, a significantly larger proportion of households in high- than in low-publicity areas thought the U.S. government decides if a product deserves the label: 51 percent in high-publicity areas and 37 percent in low-publicity areas. This difference is significant at the 10-percent level ( $p$ -value = 0.075). The proportion for both categories was 34 percent in 2008.

In low-publicity areas, 25 percent of respondents thought product manufacturers themselves decided if a product received the ENERGY STAR label, compared to only 12 percent of respondents in high-publicity areas. This difference is statistically significant at the 5-percent level of confidence.

**Designates ENERGY STAR-Labeled Product by Publicity Category**  
(Base = Recognize label (aided), n=446)



\*\* High- and low-publicity areas proportions are statistically different from each other at the 5-percent level of significance ( $p$ -value $\leq$ 0.05).

\* High- and low-publicity areas proportions are statistically different from each other at the 10-percent level of significance ( $p$ -value $\leq$ 0.1).

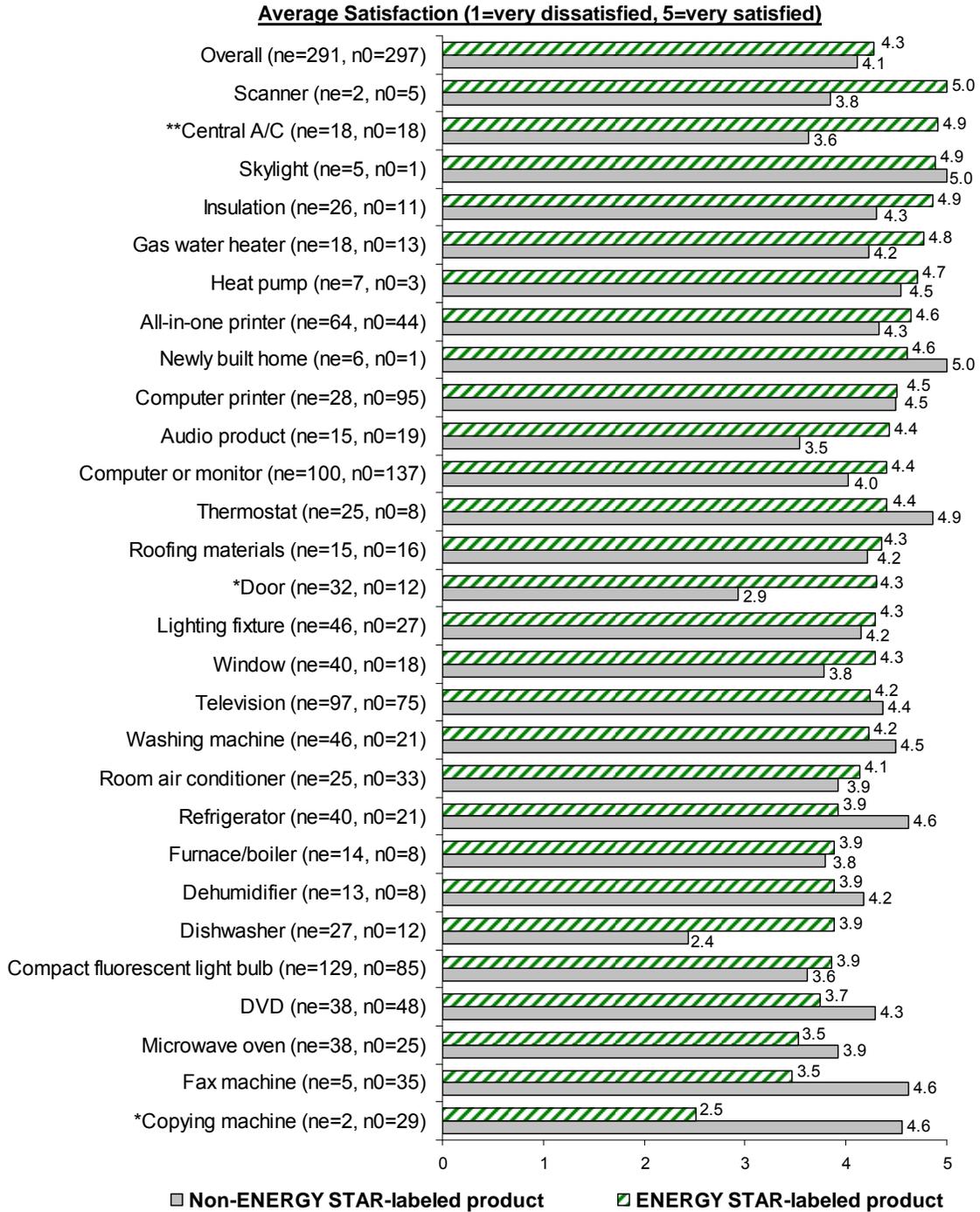
## 2 ENERGY STAR PRODUCT SATISFACTION

For most products, household satisfaction with a given product in a product category that has an ENERGY STAR specification does not appear to vary based on whether or not the product had an ENERGY STAR label. On a scale of 1 to 5, where 1 means “very dissatisfied” and 5 means “very satisfied,” products with and without the ENERGY STAR label had an average satisfaction rating between 4.1 and 4.3.

ENERGY STAR-labeled central air conditioner and doors received higher satisfaction ratings compared with the equivalent product without the label (p-value = 0.017 and p-value = 0.073). The satisfaction rating of copying machines was lower for ENERGY STAR-labeled models than for non-ENERGY STAR-labeled models (p-value = 0.001), though that result is significant, it was based on the responses of only two ENERGY STAR-labeled copier purchasers.

Three ENERGY STAR-labeled products showed a statistically significant increase in customer satisfaction between 2008 and 2009. These were insulation (p-value = 0.016), skylights (p-value = 0.012), and central air conditioning (p-value = .040). No ENERGY STAR labeled products showed a decrease in customer satisfaction over the same period.

**ENERGY STAR vs. Non-ENERGY STAR-Labeled Product Satisfaction  
(Bases = Recognize label (aided) and purchased specified product<sup>13</sup>)**



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

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

<sup>13</sup> ne = number of respondents that recognized the label (aided) and purchased this product with an ENERGY STAR label  
n0 = number of respondents that recognized the label (aided) and purchased this product without an ENERGY STAR label

### 3 CONSUMER PERCEPTIONS

Survey respondents that recognized the ENERGY STAR label (aided) were asked to indicate how strongly they agree or disagree with a number of attitudinal statements about ENERGY STAR-labeled products.<sup>14</sup> The statements were shown to respondents in random order.

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

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

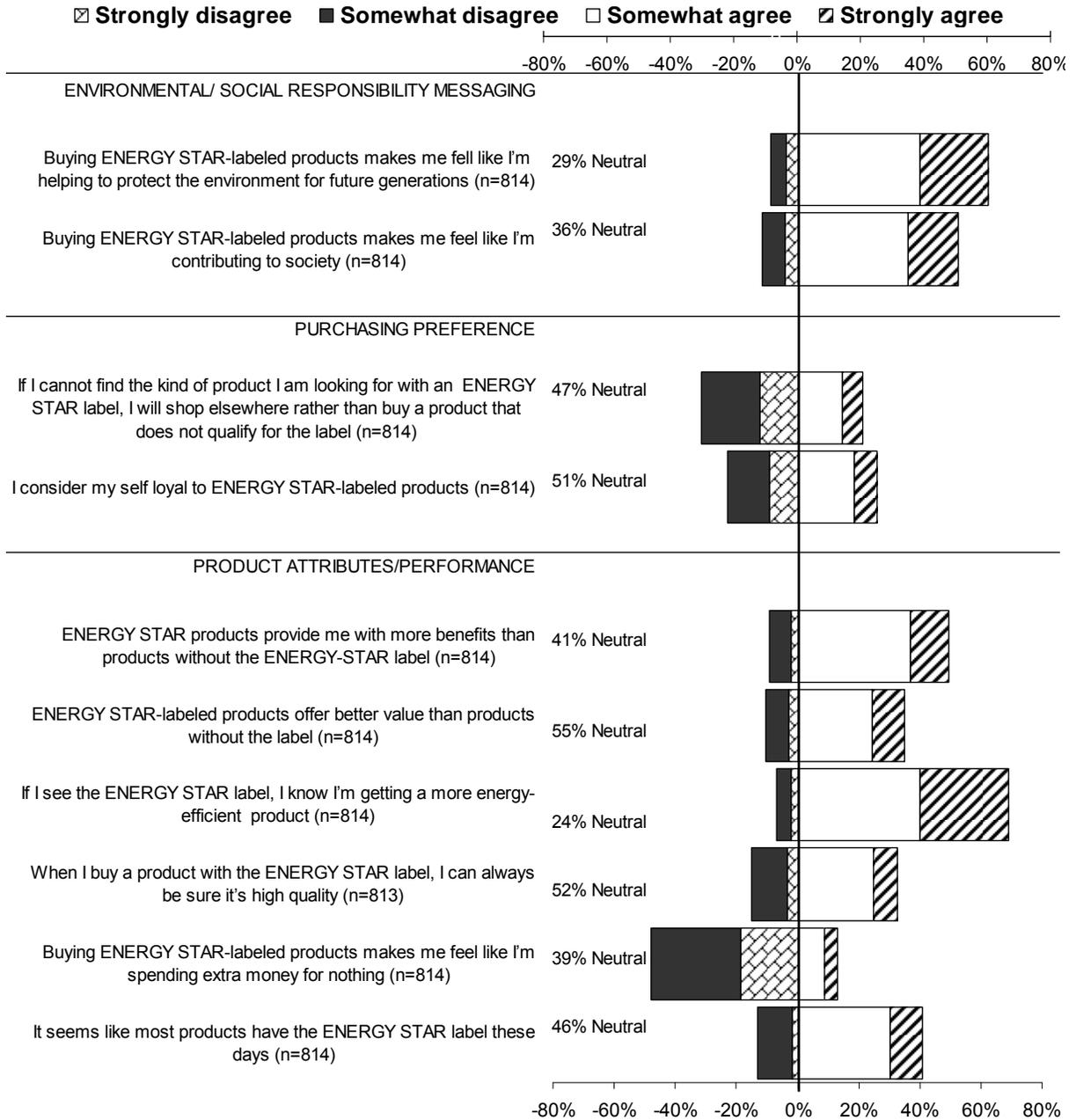
The 2009 survey results indicate that households generally agree with positive statements about the ENERGY STAR label and disagree with negative statements about the label.<sup>15</sup> Similar to the 2008 results, few statements elicit strong agreement or strong disagreement among substantial proportions of households; in contrast, a number of statements generated neutral responses from a sizeable proportion of households. A more detailed discussion of the findings regarding the attitudinal statements is provided on the following pages.

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<sup>14</sup> These statements are numbered Q16a through Q16p in the survey.

<sup>15</sup> In this discussion, the term “agree” is used to correspond to survey responses of “strongly agree” or “somewhat agree.” Similarly, the term “disagree” corresponds to survey responses of “strongly disagree” or “somewhat disagree.”

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



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

### **3.1 Environmental and Social Responsibility Messaging**

The development of the environmental and social responsibility messaging of the ENERGY STAR label has been a strong focus of the national ENERGY STAR education campaign. In the 2009 survey, two statements addressed the label's messaging in these areas: "Buying ENERGY STAR-labeled products makes me feel like I'm helping to protect the environment for future generations" and "Buying ENERGY STAR-labeled products makes me feel like I'm contributing to society."

Of the ten statements that explore consumer attitudes toward the ENERGY STAR label and products, these two ranked second and third in terms of the proportion of households who agree with the statements. These two statements had the same ranking in the three previous years. Of households that recognize the ENERGY STAR label, 62 percent either strongly or somewhat agree with the statement that by buying ENERGY STAR-labeled products they feel they are helping protect the environment. Fifty-three percent of ENERGY STAR aware households strongly or somewhat agree that by purchasing ENERGY STAR-labeled products they feel they are contributing to society.

### **3.2 Purchasing Preferences**

Increasing consumers' preferences for purchasing ENERGY STAR-labeled products is also an intended outcome of the national education campaign. In the 2009 survey, two separate statements were included to investigate households' views of their purchasing preferences with respect to ENERGY STAR-labeled products. In 2009, twenty-one percent of households either strongly or somewhat agree with the statement, "If I cannot find the kind of product I am looking for with an ENERGY STAR label, I will shop elsewhere rather than buy a product that does not qualify for the label." This is a significant decrease compared to twenty-seven percent in 2008 ( $p=0.044$ ). More households (31 percent) either strongly or somewhat disagree. However, the largest proportion of households—47 percent—are neutral in their level of agreement or disagreement with this statement of their purchasing behavior.

Similar to 2008, twenty-seven percent of households agree with the second statement addressing households' views of their purchasing preferences: "I consider myself loyal to ENERGY STAR products." Disagreement with this statement was 23 percent, also similar to 2008.

### 3.3 Product Attributes and Performance

A third goal of the national ENERGY STAR education campaign has been to inform consumers that ENERGY STAR qualifying products are more energy efficient than non-qualifying models. The degree to which this goal is being accomplished is addressed in the 2009 survey by asking respondents their level of agreement or disagreement with the statement “If I see the ENERGY STAR label, I know I’m getting a much more energy-efficient product.” Sixty-nine percent of respondents either strongly or somewhat agree with this statement. This indicates a high perception among consumers that the ENERGY-STAR label indicates superior performance with respect to energy efficiency relative to products without the label.

The survey addressed perceptions of product quality. Survey respondents were asked the level at which they agreed or disagreed with the statement “When I buy a product with the ENERGY STAR label, I can always be sure it’s high quality.” The results show that 34 percent of households either strongly or somewhat agree with this statement—almost three times as many as those who strongly or somewhat disagree—52 percent are neutral. Household agreement and disagreement with this statement is similar to last year’s results.

A number of attitudinal statements were included in the survey to measure consumers’ perceptions of ENERGY STAR-labeled product value. One of these statements is “ENERGY STAR products provide me with more benefits than products without the ENERGY STAR label” The results show that half of households (50 percent) either strongly or somewhat agree with the statement, while only nine percent of households disagreed (forty-one percent were neutral). However, on another statement “ENERGY STAR-labeled products offer better value than products without the label.” The proportion that either strongly or somewhat agrees in 2009 was 35 percent, down from 41 percent in 2008 ( $p$ -value = 0.055). A similar proportion disagreed (10 percent in 2009, 8 percent in 2008) and were neutral (55 percent in 2009 and 51 percent in 2008) across years.

The results related to the statement “Buying ENERGY STAR-labeled products makes me feel like I’m spending extra money for nothing” provide additional information on perceptions of product value. Here, nearly half (48 percent) of all households who recognize the ENERGY STAR label strongly or somewhat disagree with the statement, while 39 percent of households are neutral. Only 13 percent agree with this statement. The proportions of households that agree and disagree with this statement in 2009 are similar to the 2008 results.

### 3.4 Consumer Perceptions by Publicity Category

The 2009 results also suggest that local and regional efforts to publicize ENERGY STAR have been successful in affecting consumer perception of the label. There are statistically significant differences between high- and low-publicity areas for two of the ten attitudinal statements.

A smaller proportion of people in high-publicity areas (13 percent) than low-publicity areas (20 percent) agrees with the statement “Buying ENERGY STAR-labeled products makes me feel like I’m spending extra money for nothing,” ( $p=0.099$ ). Conversely, a larger proportion in high-publicity areas than in low is neutral on the statement (40 percent and 31 percent respectively,  $p=0.073$ ).

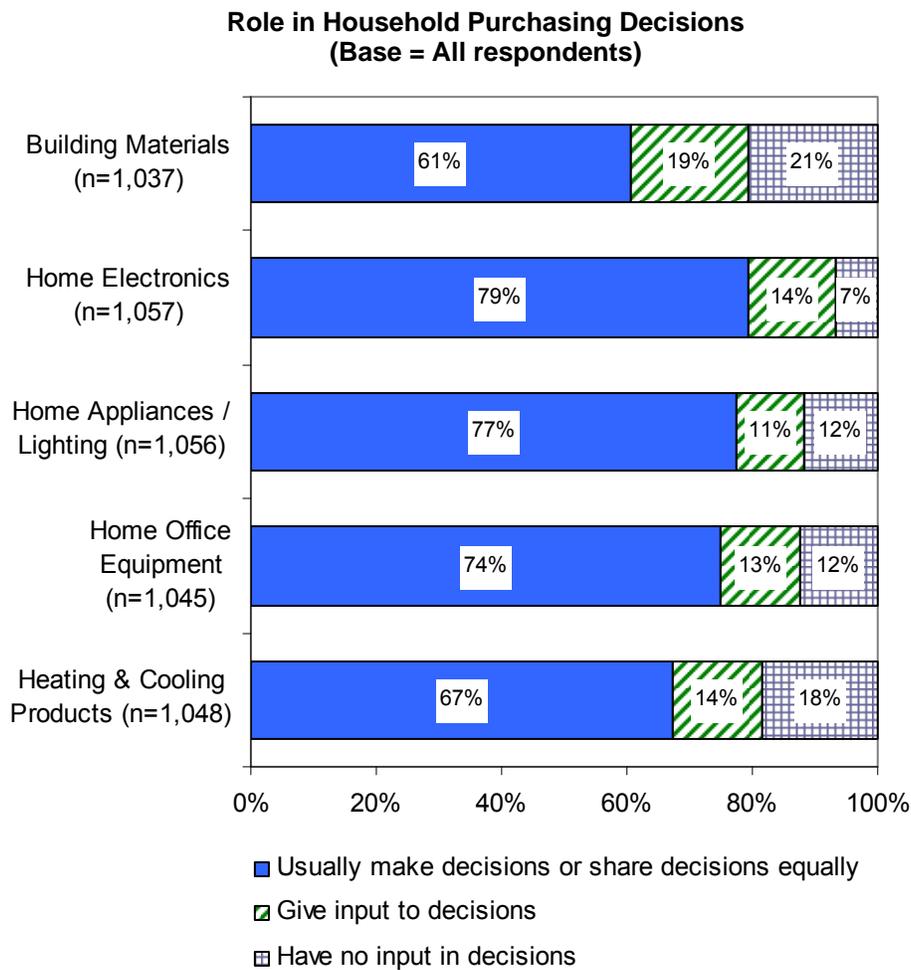
In high-publicity areas, a larger proportion disagrees with the statement “It seems like most products have the ENERGY STAR label these days” than in low-publicity areas, 15 percent and 9 percent respectively ( $p=0.055$ ). Proportions neutral and in agreement were similar across publicity categories.

The level of consumers’ agreement, disagreement, and neutrality is similar in high- and low-publicity areas for the following statements:

- “ENERGY STAR products provide me with more benefits than products without the ENERGY-STAR label.”
- “ENERGY STAR-labeled products offer better value than products without the label.”
- “If I cannot find the kind of product I am looking for with an ENERGY STAR label, I will shop elsewhere rather than buy a product that does not qualify for the label.”
- “Buying ENERGY STAR-labeled products makes me feel like I’m helping to protect the environment for future generations.”
- “Buying ENERGY STAR-labeled products makes me feel like I’m contributing to society.”
- “I consider my self loyal to ENERGY STAR-labeled products.”
- “If I see the ENERGY STAR label, I know I’m getting a more energy-efficient product.”
- “When I buy a product with the ENERGY STAR label, I can always be sure it’s high quality.”

## 4 PURCHASING DECISIONS

At the end of the survey, respondents were asked to characterize their role in the household purchasing decisions. The results indicate that the vast majority of those represented are primary decision makers, meaning they usually make household purchasing decisions alone or share equally in these decisions. As can be seen below, this varies little across product categories. Seventy-nine percent of individuals were primary decision makers for their household's home electronics purchases, whereas this was true for 61 percent for purchases of building materials.

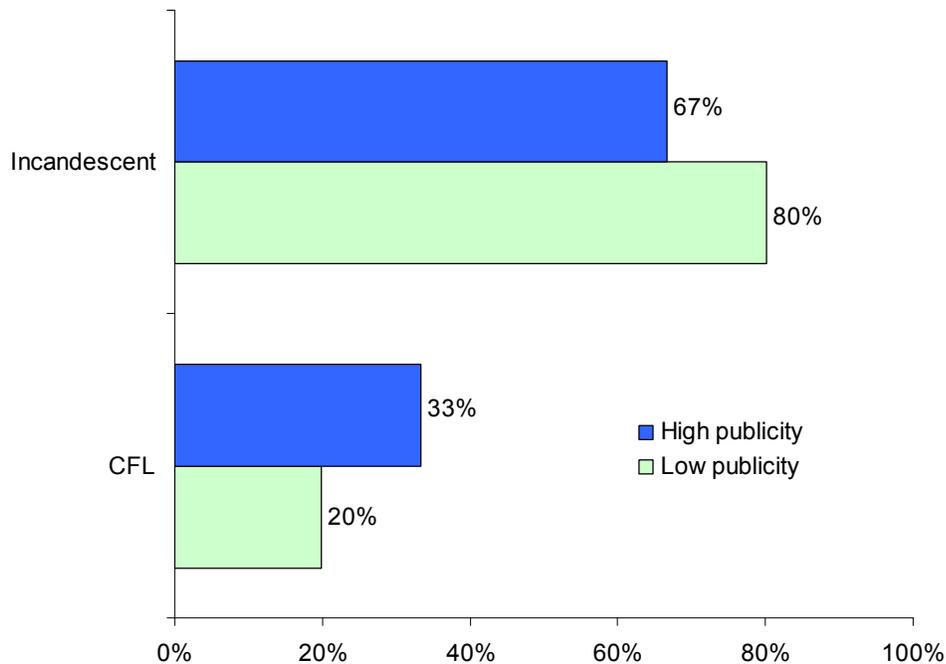


## 5 CFL PURCHASER QUESTIONS

Similar to previous years, all respondents are asked what products they have purchased in the last 12 months.<sup>16</sup> Twenty-one percent and 7 percent of households purchased compact fluorescent light bulbs (CFLs) and fixtures, respectively. Similar to 2008, the 2009 survey included follow-up questions for purchaser of CFLs and fixtures.

An overwhelming majority (93 percent) of CFL purchasers indicated they installed the purchased CFL. This result did not vary significantly by publicity category. Respondents that installed CFLs were then asked if the purchased CFL was used to replace a CFL or an incandescent light bulb. Similar to 2008, three-quarter of households replaced an incandescent light bulb with the purchased CFL. However, unlike last year, the 2009 difference between proportions of households in high- and low-publicity areas that replaced incandescent bulbs is not significant at the 10-percent level.

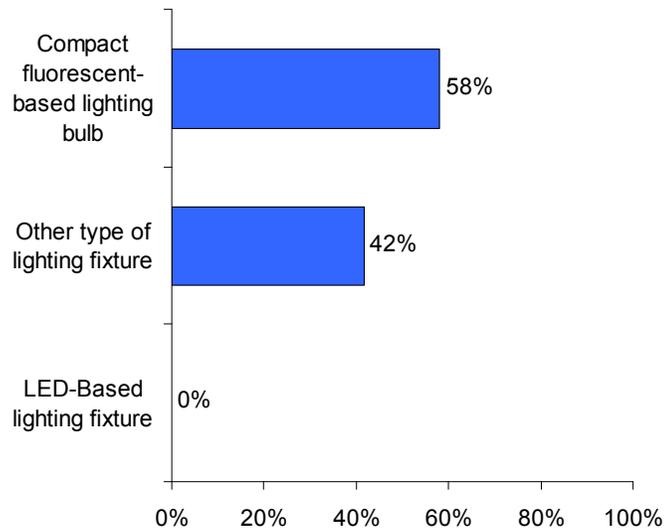
**Type of Light Bulb Replaced with a CFL**  
(Base = Installers of Compact Fluorescent Light Bulbs, n=229)



<sup>16</sup> Q12(a-c). Please look at each of the groups of products again. Which of these products have you purchased in the last 12 months? Please select all that apply.

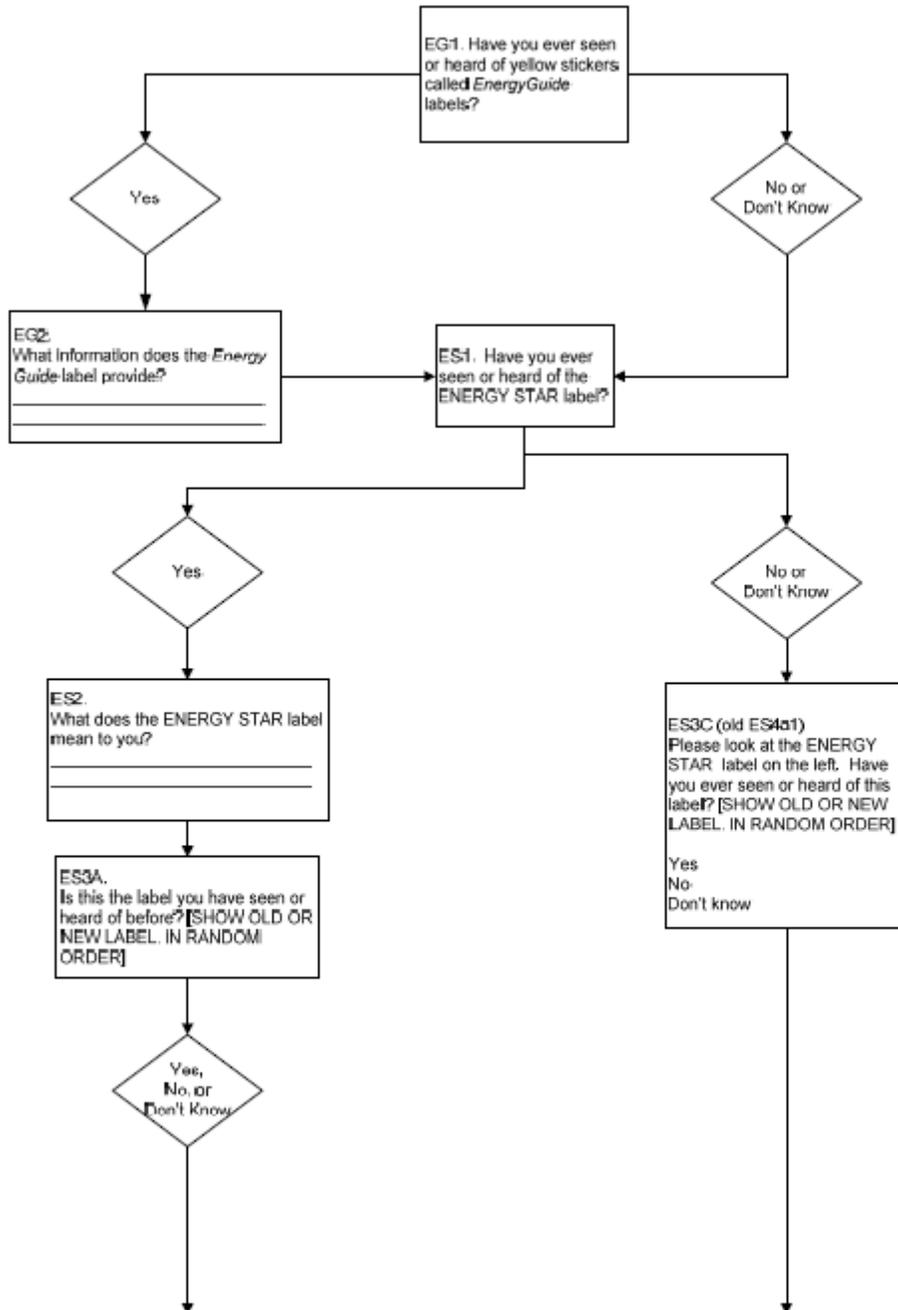
Consistent with previous years, purchasers that recognize the ENERGY STAR label are asked if they saw the label on the product(s) they purchased.<sup>17</sup> Respondents that reported purchasing an ENERGY STAR-labeled lighting fixture were asked what kind of ENERGY STAR-labeled lighting fixture they purchased. Fifty-eight percent of ENERGY STAR-labeled lighting fixture purchasers report purchasing a compact fluorescent-based lighting fixture. These results do not vary significantly by publicity category.

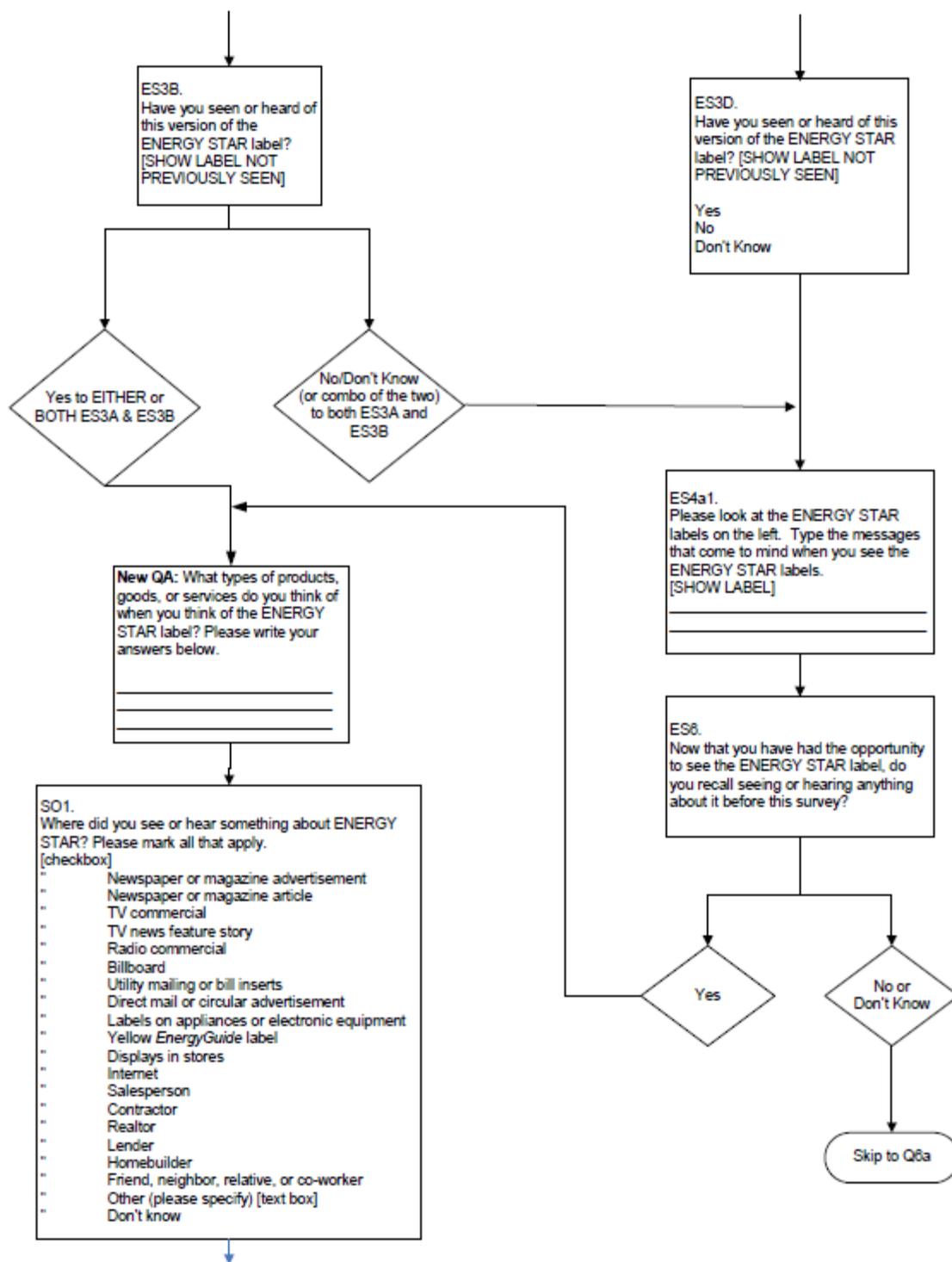
**Type of ENERGY STAR-Labeled Lighting Fixture Purchased  
(Base = Purchasers of ENERGY STAR Lighting Fixture, n=28)**

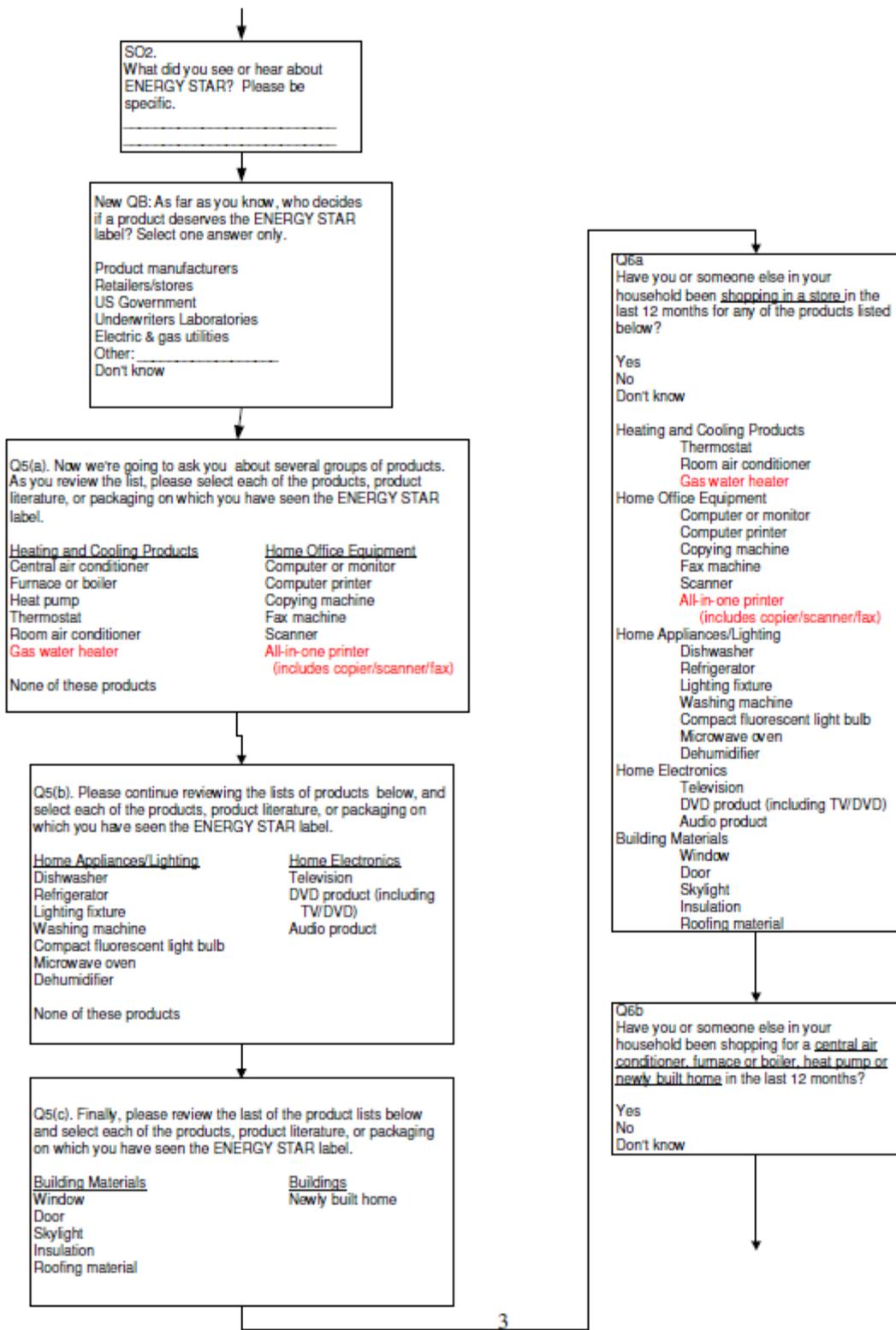


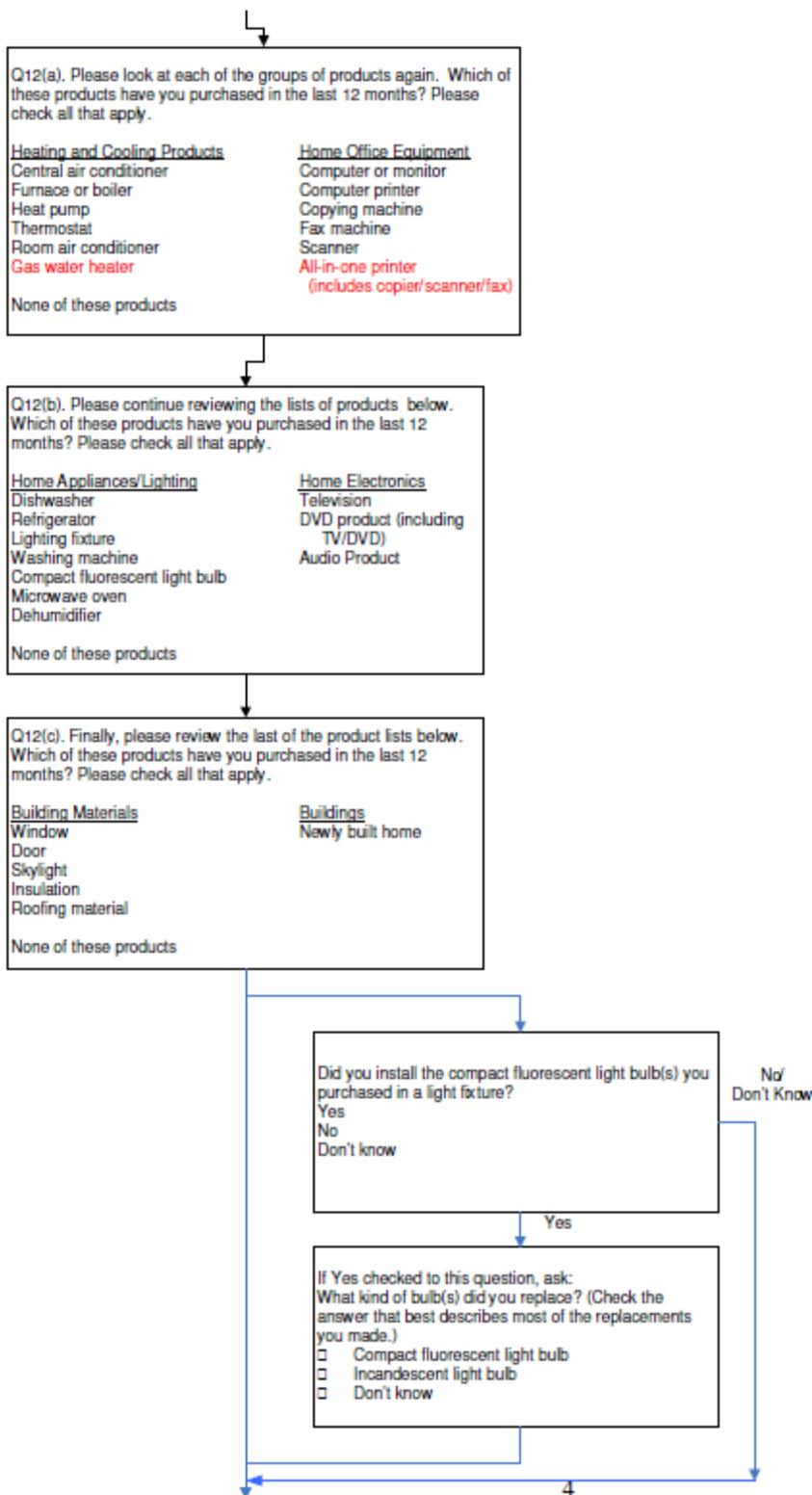
<sup>17</sup> Q7. For any products you purchased, did you see the ENERGY STAR label?  
If yes, to Q7 then respondents are asked: Q7a. On which products did you see the ENERGY STAR label? (only shown the products they purchased in the last 12 months (Q12)).

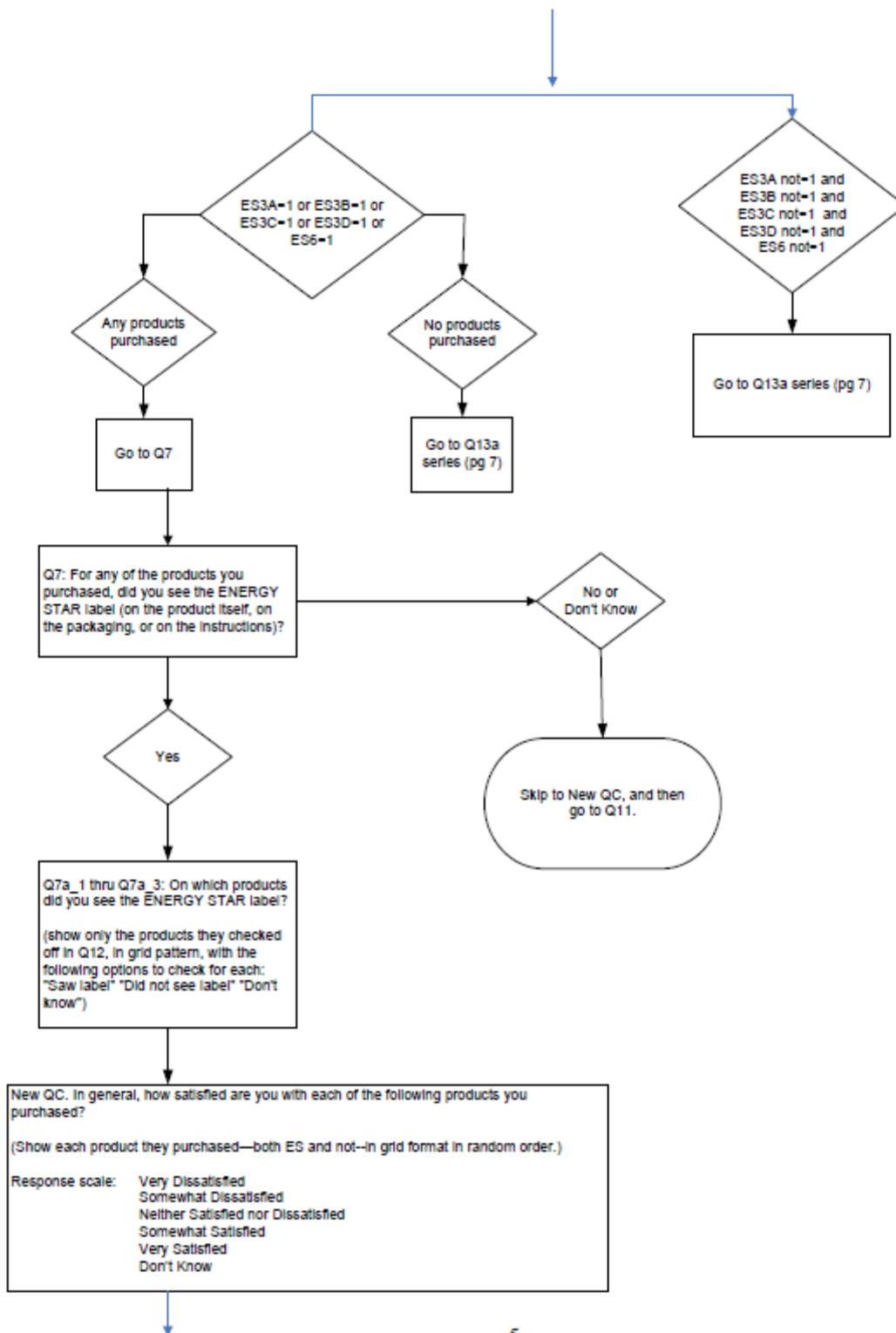
# APPENDIX D: 2009 SURVEY QUESTIONS AND FLOW CHART

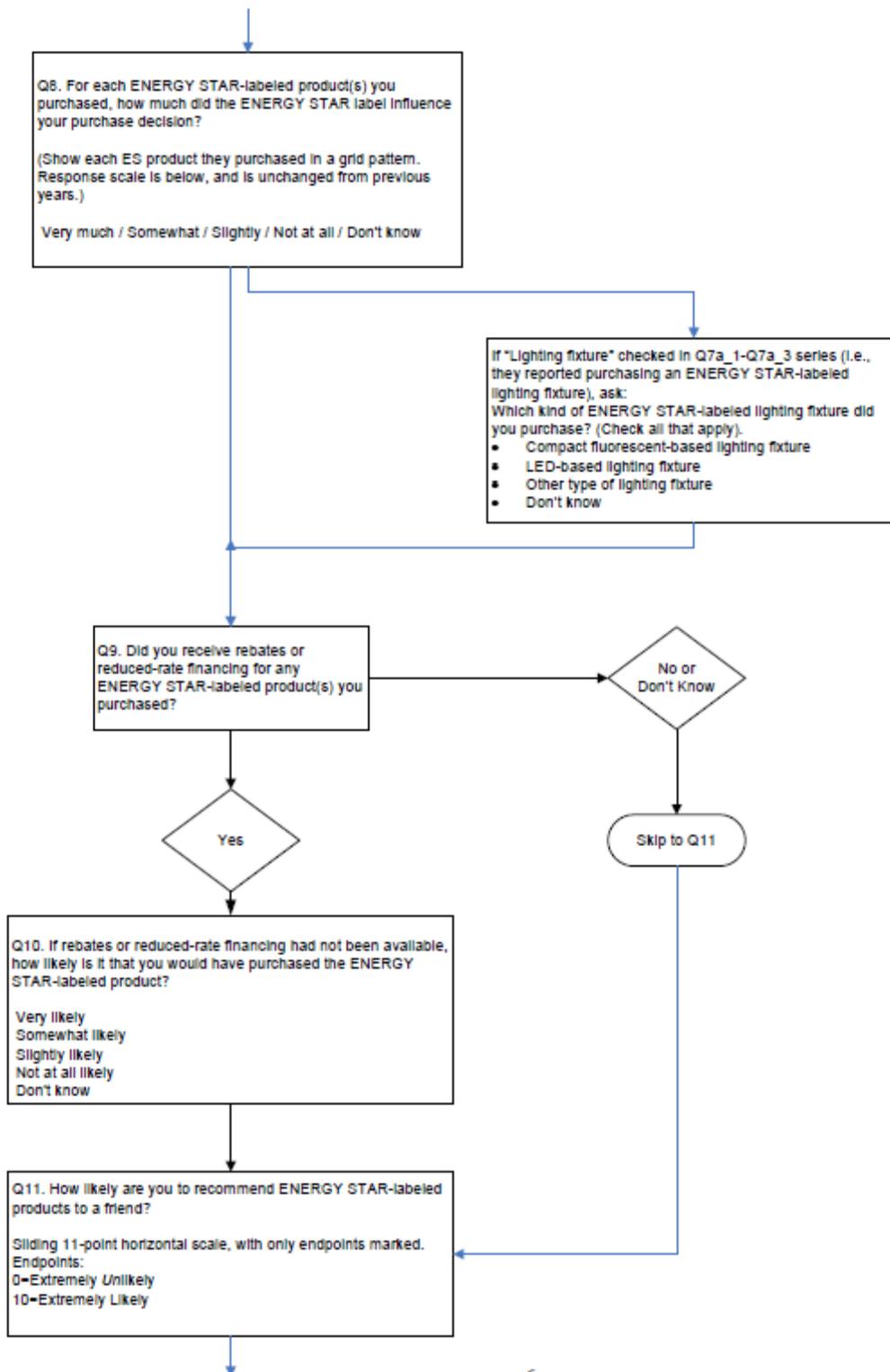


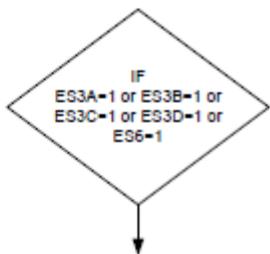




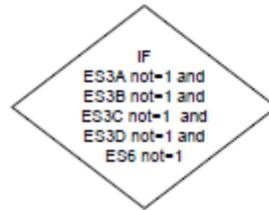








Note: These two diamonds are the same as on page 5.



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

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

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
Q16a. ENERGY STAR-labeled products provide me with more benefits than products without the ENERGY STAR label.	1	2	3	4	5
Q16c. ENERGY STAR-labeled products offer better value than products without the label.	1	2	3	4	5
Q16d. If I cannot find the kind of product I am looking for with an ENERGY STAR label, I will shop elsewhere rather than buy a product that does not qualify for the label.	1	2	3	4	5
Q16f. Buying ENERGY STAR-labeled products makes me feel like I'm helping to protect the environment for future generations.	1	2	3	4	5
Q16h. Buying ENERGY STAR-labeled products makes me feel like I'm contributing to society.	1	2	3	4	5
Q16i. Buying ENERGY STAR-labeled products makes me feel like I'm spending extra money for nothing.	1	2	3	4	5
Q16l. I consider myself loyal to ENERGY STAR-labeled products.	1	2	3	4	5
Q16n. It seems like most products have the ENERGY STAR label these days.	1	2	3	4	5
Q16o. If I see the ENERGY STAR label, I know I'm getting a more energy-efficient product.	1	2	3	4	5
Q16p. When I buy a product with the ENERGY STAR label, I can always be sure it's high quality.	1	2	3	4	5

Q16a. Please tell us about your role in your household's purchasing decisions. For each of the product groups listed below, do you usually make the purchasing decisions, do you share the decision-making equally with another household member, does someone else usually make the decisions but you have some input, or do you have no input in the decision-making?

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

Go to demographic questions and closing