Massachusetts Consumer Survey Results 2012

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Executive Summary

NMR Group, Inc. (NMR) served as the primary contractor for this research effort, with Tetra Tech, Inc. acting as subcontractor (here after the Team). The research presented here compares the results of a telephone survey (here after the 2012 survey), performed between June 18, 2012 and August 2, 2012, with the results of a similar survey (here after the 2011 survey) performed between December 8, 2011 and January 19, 2012.[1] The 2011 survey sought to establish a baseline at the onset of the changes in lighting standards resulting from the Energy Independence and Security Act of 2007 (EISA) while the 2012 survey searched for possible changes in the lighting market since the initial implementation of EISA. When possible, the Team also compares the results to those obtained from lighting consumer surveys conducted in 2009 and 2010.

Background and Methodology

The goal of the consumer survey was to track key indicators of the market for compact fluorescent lamps (CFLs), light emitting diodes (LEDs), and halogens as well as the impact of EISA. Topics addressed in the first wave of consumer surveys included the following, some of which allowed for the continued monitoring of the market from earlier evaluations (*e.g.* awareness of CFLs):

- Awareness of and familiarity with spiral and specialty CFLs, LEDs, and halogens meant to replace A-line incandescent bulbs
- Awareness of and anticipated reactions to EISA
- Current use of CFLs and LEDs
- Satisfaction with CFLs and perceived advantages and disadvantages of using CFLs
- Changes in CFL satisfaction and possible reasons for these changes
- Exposure to recent media attention to lighting and its potential influences on CFL satisfaction
- Recent light bulb purchases, particularly of 100 Watt incandescents to identify stockpiling of incandescent bulbs
- Familiarity with lighting terminology such as lumens and color temperature
- Household demographics

The Team drew the sample from among customers of the five PAs in Massachusetts. To increase response rates, we took the following steps:

[1] For details on the 2011 survey results see NMR Group. *Massachusetts Consumer Survey Results 2011*. Delivered to the Program Administrators and EEAC Consultants in April 2011. The 2011 results in this report have been updated with a new weighting scheme that is more comparable to those used in 2009 and 2010 for reasons discussed in detail in the original 2011 report.

- Sent an advance letter to potential respondents informing them of the survey
- Called households up to 10 times before removing the phone number from our call lists
- Fielded the survey in English and Spanish

In total, we surveyed 604 households, with three respondents answering the Spanish version of the survey. We weighted the data by education and home ownership status so that the results are representative of all households in Massachusetts.

Summary of Findings

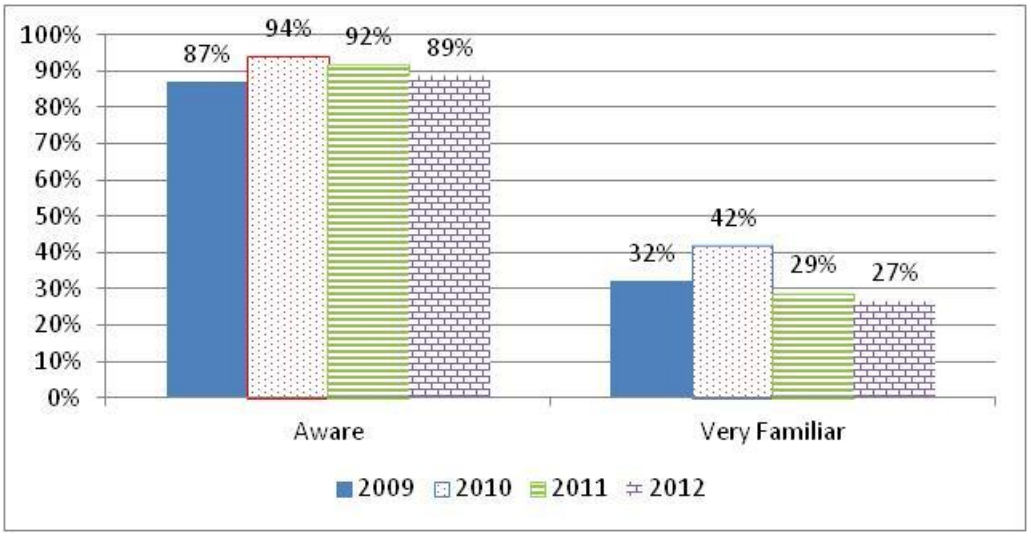
In this section, we present a summary of key findings from the 2012 telephone survey, comparing them to results of the 2009, 2010, and 2011 lighting telephone surveys when possible.

Awareness of Energy-Saving Light Bulbs

The survey assessed respondents' awareness of and familiarity with CFLs and other energy-saving bulb types.

Nearly all respondents in 2012 (89%) indicated that they had been aware of CFLs before responding to the survey (Figure ES-1). The percentage of respondents self-reporting awareness of CFLs is similar to that measured in 2009 but lower than awareness measured in 2010 and 2011. The percentage of respondents who said that they were "very familiar" with CFLs in 2012 was 27%, which is similar to the percentage from 2011 but lower than 2009 (32%) and 2010 (42%). We will continue to track this indicator in the third wave of the survey, to be fielded in late 2012 and early 2013.

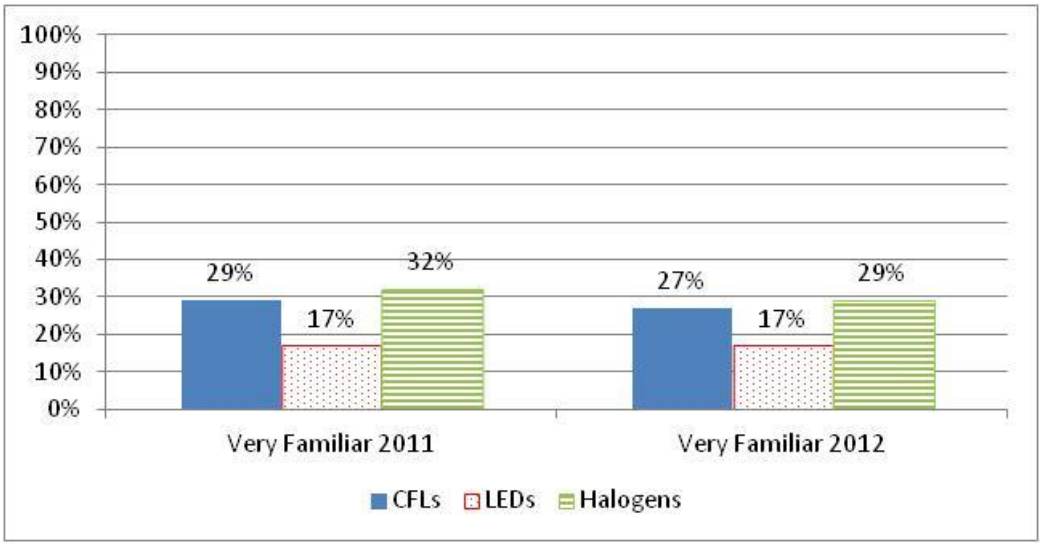
Figure ES-1: CFL Awareness and Familiarity, 2009 to 2012



Familiarity with all types of specialty CFLs (specifically, dimmable, 3-way, flood/recessed, candelabra, globe, and A-line versions) increased from 2010 to 2012, with the increase likely reflecting the PAs' efforts to promote such bulbs. However, the increases in familiarity tend to be more from "not too familiar" to "somewhat familiar." Respondents generally still do not report being "very familiar" with any type of specialty CFL.

Only 17% of respondents reported being "very familiar" with A-line screw-in LEDs, the same percentage as in the 2011 survey; 29% of respondents said they were familiar with A-line, screw-in halogen bulbs, a similar percentage as reported in 2011 (Figure ES-2). Based on work the Team has conducted elsewhere that showed very little familiarity with halogen bulbs,[2] we suspect that respondents may have confused halogen bulbs meant to replace incandescents with other types of halogen bulbs. Most respondents (72%) who voiced awareness of both CFLs and halogens correctly concluded that CFLs save more energy than halogens.

Figure ES-2: Familiarity with CFLs, LEDs, and Halogen Bulbs



Almost one-half (45%) of respondents indicated that they had heard news stories about lighting products in the past year. The most frequently remembered content of the stories included the incandescent phase-out (mentioned by 30% of respondents), that newer bulb types were more energy efficient (24%), that CFLs contained mercury and required careful disposal (19%), comparisons of newer and older bulb types (13%), and that LEDs and/or CFLs last longer but are more expensive (12%).

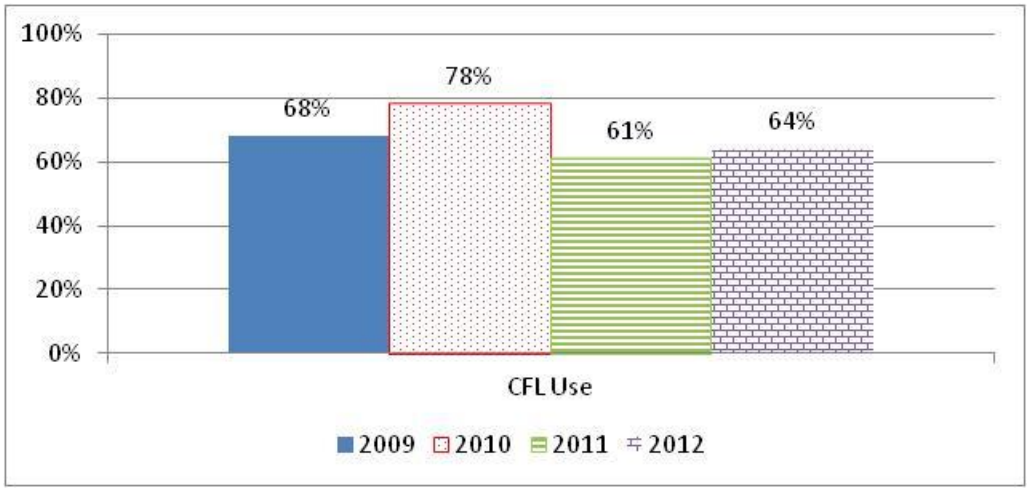
Use of Various Lighting Technologies

When asked if they had ever used CFLs, 64% of respondents said that they had used them (Figure ES-3). This percentage is statistically similar to self-reported use in 2009 and 2011, but

[2] NMR Group, Inc. 2011. "Connecticut Lighting Focus Groups: Exploration of Market and Reactions to Various Efficient Lighting Choices."
Available at http://www.ctenergyinfo.com/111121%20EISA%20Lighting%20Focus%20Groups%20Report.pdf

lower than in 2010. However, onsite verified use of CFLs in early 2012 was much higher—96% of the households visited used at least one CFL, demonstrating that the self-reported decrease in CFL use does not reflect respondents' actual behavior. Consumers may be confused about what constitutes a CFL bulb or their responses have been influenced by other factors, leading to the contradictory self-reported responses and onsite verified use. About one-fifth of respondents (18%) reported using dimmable CFLs.

Figure ES-3: Respondents that have Ever Used CFLs, 2009 to 2012



A total of 64% of households say that they use at least one incandescent in their home, but 26% of households self-reported use the 100 Watt incandescent (covered by the first stage of EISA currently being implemented). In contrast, the 2012 onsite study found that 51% of onsite homes had 100 Watt incandescents installed, but these accounted for only about three percent of all sockets in the onsite homes.

Sixteen percent of respondents report using screw-in LEDs at this time. These bulbs are most frequently used in floor, table, or other portable lamps.

Recent Lighting Purchases

Only 14% of respondents had shopped for 100 Watt incandescent light bulbs in the three months prior to the survey. Of those who had shopped for the bulbs, most (63%) were able to find them on store shelves, though this represents a significant decrease from the 77% who were able to do so in 2011, likely revealing effects of EISA on 100 Watt availability. Eighteen of the 31 respondents who could not find 100 incandescent bulbs purchased at least one other type of bulb; some purchased more than one bulb type. In total, ten purchased incandescent bulbs, seven respondents purchased CFLs, two purchased halogen bulbs, and one purchased an LED. Five of the ten incandescent purchasers bought lower wattage bulbs, and the remaining five purchased three-way bulbs, which, as specialty bulbs, are not subject to EISA. None of the 18 respondents who could not find 100 Watt incandescents purchased a higher wattage incandescent. Note that

the other 13 respondents who could not find 100 Watt incandescents said that they did not buy any bulbs at that time.

Turning again to all 604 respondents, 42% of respondents reported buying at least one type of light bulb in the three months prior to the survey. CFLs (15% of all 604 respondents) and incandescents (23% of respondents) were most commonly purchased, although at least some respondents also reported buying halogens, fluorescent tubes, LEDs, and pin-based CFLs or LEDs. Note that purchase rates overall in the 2012 survey—fielded in early summer—are lower than in the 2011 study, which was fielded during the winter lighting season.

Key Lighting Concepts

When asked what types of information they look for on bulb packing, 96% of respondents report that they consider wattage, 92% consider price, and 70% consider wattage equivalency. These percentages are statistically similar to those reported in the 2011 survey. Other characteristics considered by more than one-half of the respondents include bulb life, color appearance, the ENERGY STAR label, and bulb shape.

Given that lumens and color appearance will become increasingly important aspects of choosing a light bulb after the phase-out of incandescent bulbs, the Team asked respondents if they had heard of these terms, and, if so, what the terms meant. Most consumers had heard of lumens (55%) and the terms "warm white" and "cool white" (67%), which were similar but slightly higher percentages to those we observed in 2011. Of those who had heard these terms, 74% (or 45% of all 604 respondents) correctly understood that lumens referred to light output or brightness, the same percentage as in 2011. Of those who had heard the terms "warm white" and "cool white", 83% (or 60% of all 604 respondents) correctly identified them as referring to the color appearance of the bulb. This percentage is statistically lower than the 92% from 2011. In 2012, more respondents (7%) seemed to confuse color rendition and color appearance.

Awareness of and Reactions to EISA

The survey continued to track awareness of EISA and reactions to the phase out of 100 Watt incandescent bulbs. Fewer than one-half (42%) of respondents reported being aware of the incandescent phase-out resulting from EISA; this is statistically lower than the 47% observed in the 2011 survey, which coincided with the initial implementation of the phase-out when the transition was receiving greater media attention.

Even if they are not aware of the incandescent phase-out, at some point consumers will be confronted with the fact that most incandescent bulbs will no longer be available on store shelves. Therefore, after having explained the phase-out to respondents, we asked them what type of bulb they would be most likely to purchase after 100 Watt incandescents were no longer available. Respondents did not speak with one mind about their anticipated bulb purchases. Many respondents (41%) said they would buy a lower wattage incandescent bulb, and this is

statistically higher than respondents in the 2011 survey. Another 27% said they would buy a 23 Watt CFL, a similar percentage to 2011. Only four percent of respondents said they would buy a 150 Watt incandescent, but 11% would choose a 72 Watt halogen and 10% a 17 Watt LED; all of these percentages are statistically similar to 2011.

When asked to explain their bulb choices, those who said they would buy CFLs or LEDs most often mentioned the energy savings associated with these bulbs, while those that chose the other bulb types cited preference for the light color or brightness.

The possibility that consumers will buy many incandescent bulbs and save them for use after the incandescent phase-out has been the subject of much discussion in the energy-efficiency community and in the media discussions of EISA. Our research concludes that about one-fourth (24%) of all respondents are likely to engage in this "stockpiling" or "hoarding" behavior; however, 30% of respondents who were aware of EISA prior to the survey reported being likely to stockpile incandescent bulbs.

Optimistically, few respondents have already begun stockpiling bulbs. Less than two percent of all 604 survey respondents reported having purchased six or more 100 Watt incandescent bulbs in the three months prior to survey, although the summer survey date and the seasonality of lighting purchases must be kept in mind when interpreting this result. Again keeping seasonality in mind, households likely to stockpile reported buying an average of 5.7 100 Watt incandescent bulbs compared to 4.5 among those unlikely to stockpile. In the 2011 survey, we had found a much larger discrepancy between average purchases of those likely and unlikely to stockpile, with those likely to stockpile buying an average of 17.7 bulbs compared to just 5.1 among those unlikely to stockpile. The onsite survey also noted relatively small rates of stockpiling of incandescent bulbs, but the rates were higher among those households that reported in the 2011 survey that they would be likely to stockpile. Thus, evidence is mixed about the severity of stockpiling, and the seasonality of lighting purchases complicating the interpretation of the results.

CFL Price Awareness and Satisfaction

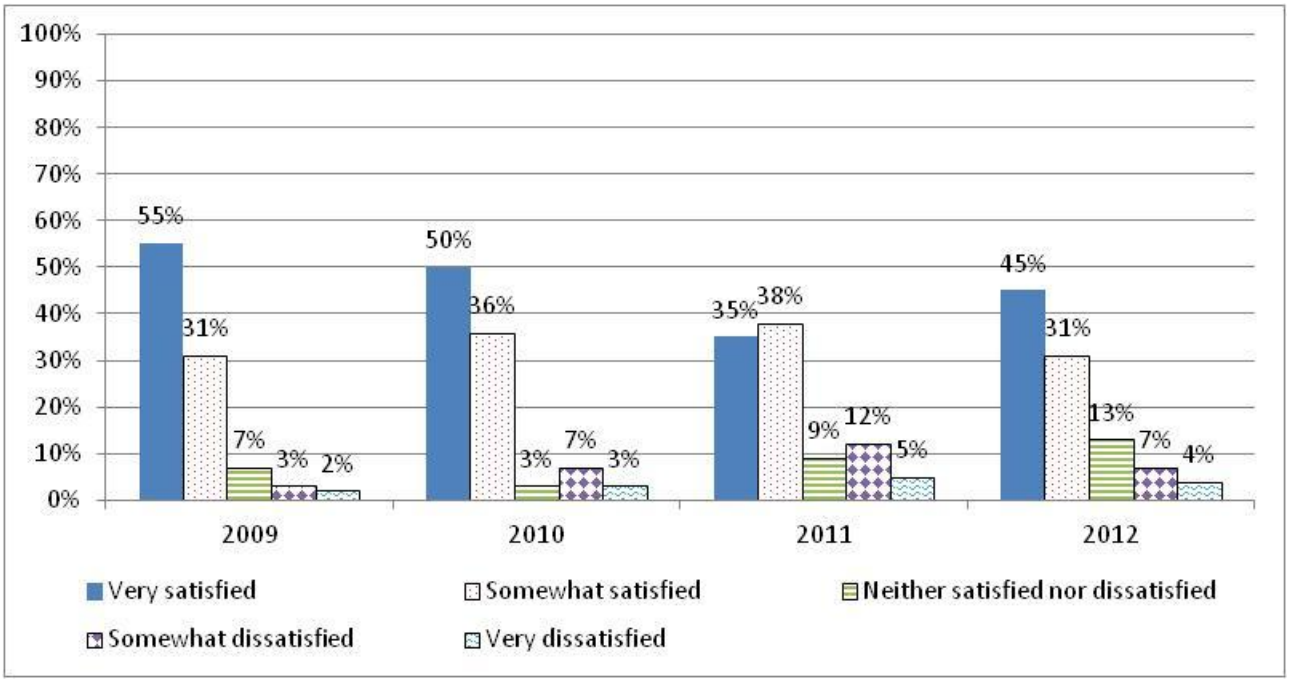
The price of CFLs has risen in the past year due to the scarcity of rare earth minerals, some of which are key components of CFLs.[3] The survey asked respondents who are somewhat or very familiar with CFLs if they had noticed a price increase and, if so, whether the increase had prevented them from buying CFLs. The majority of respondents who were somewhat or very familiar with CFLs (45%) had not noticed whether the price of CFLs had changed from last year to this year. In fact, 35% thought the price was the same or lower than last year, and only 13% thought it was higher. Moreover, 18% of respondents who recently purchased CFLs were likely to say that the price was *lower* in the past year. It may be that consumers have not been directly

[3] DiClerico, Daniel. 2011. "Shortage of rare earth metals results in higher CFL prices." *Consumer Reports*. September 16, 2011. Available at http://news.consumerreports.org/appliances/2011/09/shortage-of-rare-earth-metals-stokes-controversy-around-cfls.html.

exposed to the price increase because PA programs lower the price of bulbs on store shelves, or that they do not buy CFLs often enough to notice the prices. Of 48 respondents who had noticed a price increase, 40% said it prevented them from buying a CFL.

The percentage of respondents "very satisfied" with CFLs increased significantly from 2011 to 2012, but remained statistically lower than satisfaction in 2009 and statistically similar to satisfaction in 2010 (Figure ES-4). Due to the concerns raised in response to the decreased levels of satisfaction found in the 2011 survey, the Team added a question in 2012 to determine if respondents' satisfaction with CFLs had changed over time, and, if so, why their opinions had changed. More than three out of four CFL users (76%) said their satisfaction with CFLs had stayed the same, and 18% said their satisfaction had increased. Only 5% replied that they were less satisfied with CFLs now than a year ago.

Figure ES-4: CFL Satisfaction, 2009 to 2012



Out of the 31 respondents who indicated their satisfaction with CFLs increased over the past year and who had been exposed to media stories about lighting, 67% said that news stories contributed to their increased satisfaction. Alternatively, of the 13 respondents whose satisfaction with CFLs decreased and who had been exposed to lighting news stories, 59% indicated that news stories were responsible for the decrease. These findings indicate that media attention toward lighting has the capability to sway opinions toward the bulbs in either direction, depending on the content of the story, but, on the whole, the influence appears to have been more positive than negative in the past year.

When asked what they did like about CFLs, respondents—both those who are and are not satisfied with them—most often cited that they save energy, have a long bulb life, and save money on bills. In contrast, respondents are less happy with how slow CFLs are to brighten,

mercury and disposal issues, and poor light color. For dimmable CFLs, respondents focused on the fact that these bulbs are also slow to turn on/brighten, and do not dim as much as other bulb types.

Conclusions and Recommendations

Earlier in 2012, the Team delivered the 2011 (first wave) consumer lighting report; this report described EISA baseline conditions, as the survey coincided with the initial implementation of the new lighting standards. Currently the PAs and EEAC Consultants are reviewing a revised draft of the spring 2012 lighting saturation study, which also provided information on residential lighting use during the early stages of EISA implementation. This report serves as an interim check-in on the residential lighting market one-half year after the earliest phases of EISA implementation. Therefore, the team refrains from drawing new conclusions or making recommendations. Instead, we review the recommendations from the 2011 consumer survey and the 2012 onsite saturation study in light of the findings from this current report.

Satisfaction with CFLs: The 2011 survey provided evidence that customer satisfaction with CFLs was declining, while the onsite study demonstrated that, in fact, those dissatisfied with CFLs used fewer of them—even though they still typically used at least some CFLs. The current study, in contrast, found that CFL satisfaction was higher in 2012 than in 2011 but remained below 2009 and 2010 levels. While most survey respondents indicated that their satisfaction with CFLs had not changed, 18% reported increased satisfaction with CFLs, while 5% said their satisfaction had decreased. Importantly, news stories about lighting influenced these changing opinions—both the positive and the negative ones. The Team will continue to explore CFL satisfaction in the third wave of the consumer survey and in the upcoming 2013 saturation study, and we continue to recommend that the PAs work with the residential retail products and other residential evaluation teams as well as program implementers to understand the dynamics of consumer satisfaction with CFLs and LEDs more fully.

The Team also previously recommended that the PAs continue to work with program partners to support the highest quality CFLs and LEDs on the market and that the PAs develop educational materials that highlight the features of LEDs that consistently perform better than CFLs (e.g., quickness to brighten, lack of mercury, lifespan) but in a manner that does not denigrate CFLs. We believe the current study results continue to suggest the relevance of both of these recommendations.

A-line CFLs: Respondents to both the 2011 and 2012 study reported relatively low levels of familiarity with A-line CFLs, and use of these bulbs is still uncommon in the homes visited for the saturation study. However, because A-line bulbs closely resemble incandescents and can fit into some types of fixtures that standard CFLs cannot (*e.g.*, those in which the shade clips onto the bulb), NMR recommended in both the 2011 study and the onsite saturation study that the PAs focus more educational and promotional efforts on A-line CFLs. The team also suggesting that the PAs consider thinking of them more as a "standard" CFL rather than a specialty one, as

most A-line CFLs will be used in general service and not specialty applications. We believe the 2012 study results support these recommendations.

Bulb Dimmability: In the 2011 survey results, NMR noted that users of dimmable CFLs generally tended to like them, but the most persistent complaint about them is that they do not dim consistently or as much as other types of light bulbs. At that time, we recommended that the PAs consider removing dimmable CFLs in favor of promoting LEDs for dimmable applications. However, since making the recommendation, the Team has learned from various sources that LEDs may have dimmability concerns as well. Therefore, we withdraw the recommendation and refrain from making new recommendations about dimmable bulbs specifically. However, the previous recommendation about continuing to promote only the highest quality energy-efficiency bulbs certainly applies to dimmable energy-efficient bulbs.

Stockpiling of Incandescent Bulbs: The results presented for both the 2011 and 2012 surveys as well as the onsite saturation effort suggested that about one-fourth of respondents will consider stockpiling incandescent bulbs, and that some respondents have already started to do so. Therefore, NMR continues to recommend that the PAs may want to consider placing a consumer education campaign that helps consumers make more informed bulb choices, rather than simply defaulting to the incandescent bulb with which they are most familiar. Moreover, as explained in the onsite study, the PAs may also want to consider asking partner retailers not to repeat "get them while you can" incandescent bulb campaigns in late 2012 and 2013, as they did in late 2011 before the 100 Watt phase-out started.

Consumer Understanding of Key Lighting Concepts: While consumers are becoming more familiar with the term "lumens" and understand that it means light output or brightness, they still buy bulbs based on wattage or wattage equivalence. Therefore, we believe that the suggestion that the PAs continue their efforts at helping consumers make the transition from thinking about Watts to thinking about lumens remains relevant.

A-line Halogen Bulbs: Although telephone survey respondents reported relatively high rates of familiarity with A-line halogen bulbs, the Team found very few of these bulbs in use in onsite households. Yet, as we noted in the onsite study, A-line halogen bulbs look almost exactly like incandescent bulbs and it is likely that consumer are unable to distinguish between the two bulb types in the store. The fact that halogen bulbs are labeled "energy efficient" only adds to consumer confusion; in fact, the number of consumers familiar with *CFLs* who identified halogen and CFLs as using the same amount of energy rose significantly between the 2011 and 2012 studies. Therefore, we believe that our suggestion that the PAs work with other organizations across the nation to try to convince manufacturers to remove the term "energy efficient" from halogen packaging remains relevant in light of the current survey results.

1 Introduction

This report presents the findings of research conducted to understand the market for energy-efficient light bulbs. NMR Group, Inc. (NMR) served as the primary contractor for this research effort, with Tetra Tech, Inc. acting as subcontractor (here after the Team). The research presented here compares the results of a telephone survey (here after the 2012 survey), performed between June 18, 2012 to August 2, 2012, with the results of a similar survey (here after the 2011 survey) performed between December 8, 2011 through January 19, 2012.[4] The 2011 survey sought to establish a baseline at the onset of the changes in lighting standards resulting from the Energy Independence and Security Act of 2007 (EISA) while the 2012 survey searched for possible changes in the lighting market since the initial implementation of to EISA. When possible, the Team also compares the results to those obtained from lighting consumer surveys conducted in 2009 and 2010.

1.1 Background

The Team fielded the consumer surveys of households in Massachusetts. The goal of the surveys was to track key indicators of the market for compact fluorescent lamps (CFLs), light emitting diodes (LEDs), and halogens as well as the impact of EISA. Many of these indicators provide information necessary to revise program savings estimates while others contribute to a broader assessment of the market at the onset of EISA implementation. The results from the 2011 and 2012 waves of the survey presented in this report will be compared to those of a third wave to be conducted in late 2012 and early 2013. Topics addressed in the first wave of consumer surveys included the following, some of which allowed for the continued monitoring of the market from earlier evaluations (*e.g.* awareness of CFLs):

- Awareness of and familiarity with spiral and specialty CFLs, LEDs, and halogens meant to replace A-line incandescent bulbs
- Awareness of and anticipated reaction to EISA
- Current use of CFLs and LEDs
- Satisfaction with CFLs and aspects of the bulbs that respondents like and dislike
- Changes in CFL satisfaction and possible reasons for these changes (2012 only)
- Exposure to recent media attention to lighting (2012 only) lighting and its potential influences on CFL satisfaction

[4] For details on the 2011 survey results see NMR Group. *Massachusetts Consumer Survey Results 2011*. Delivered to the Program Administrators and EEAC Consultants in April 2011. The 2011 results in this report have been updated with a new weighting scheme that is more comparable to those used in 2009 and 2010 for reasons discussed in detail in the original 2011 report.

- Recent light bulb purchases, particularly of 100 Watt incandescents to identify stockpiling of incandescent bulbs
- Familiarity with lighting terminology such as lumens and color temperature
- Household demographics

1.2 Methodology

To implement the surveys, we first obtained a list of randomly selected customers of each of the five PAs and drew our sample from this list according to the "desired sample" column in Table 1-1 below. We sent an advance letter to potential respondents that explained the study's objectives, asked for respondents' cooperation, and provided a toll-free number in case the household wanted to schedule a specific time to answer the survey. When calling potential respondents, we used a minimum of ten attempts over different times of the day, days of the week, and weeks of the month in an effort to increase the response rate and achieve as representative a sample as possible. To further increase response rates and population coverage, we fielded the survey in Spanish as well as in English. We finalized the survey at 604 completions, which achieves three percent precision for the entire sample at the 90% confidence level, assuming a 50% break in responses. The sampling errors for individual PAs ranged from a low of 5% for National Grid to 21% for Unitil, due to its small population size.[5] The overall response rate was 23% and no less than 21% for each PA. We performed three of the surveys in Spanish.

Table 1-1: Telephone Survey Sample

Program Administrator	Households Served	Desired Sample	Final Sample	Sampling Error	Response Rate
Cape Light Compact	201,991	42	39	13.1%	23.3%
National Grid	1,117,912	288	289	4.8%	24.2%
NSTAR	954,917	210	217	5.6%	21.0%
Unitil	40,087	12	16	21.2%	24.0%
WMECO	187,140	48	43	12.7%	26.7%
Overall	*2,502,047*	*600*	*604*	*3.0%*	*23.08%*

[5] The overall error is the most important one to consider, given that the predominant markdown method was a statewide approach offered to all consumers, not just those of specific PA service territories.

The consumer survey sample contained a greater proportion of households with people who had some education beyond the high school diploma and who owned homes than exist in the population of Massachusetts households.[6] In response, the team weighted the consumer survey by education and home ownership status so that the reported results would better reflect the characteristics of all households in the state. Table 1-2 presents this weighting scheme

Table 1-2: Population, Sample Sizes, and Weights for RDD Survey

	Households	Sample Size	Weight
State Total	*2,512,552*	*604**	
Owner-occupied housing units			
Less than high school graduate	106,875	9	2.85
High school graduate	367,185	73	1.21
Some college or Associate's degree	397,959	109	0.88
Bachelor's degree or higher	736,455	268	0.66
Renter-occupied housing units			
Less than high school graduate	155,720	4	9.36
High school graduate	251,964	30	2.02
Some college or Associate's degree	226,427	28	1.94
Bachelor's degree or higher	269,967	73	0.89

* Ten respondents refused to answer either the home ownership or the education question, or both. They were assigned a weight of one.

The Team also tests the statistical significance between some of most critical indicators in the study. We focus most of these tests on the results between 2011 and 2012, as 2011 represents the EISA baseline and 2012 is the first attempt to measure change from that baseline, but we do sometimes provide statistical tests with 2009 and 2010 as well.

[6] Underrepresentation of renters and respondents with lower levels of educational attainment is common in telephone surveys. For example, see Galesic, M., R. Tourangeau, M.P. Couper (2006) "Complementing Random-Digit-Dial Telephone Surveys with Other Approaches to Collecting Sensitive Data." *American Journal of Preventive Medicine*. Volume 35, Number 5.

2 Awareness of Energy-Saving Light Bulbs and EISA

The survey assessed respondents' awareness of and familiarity with CFLs and other energy-saving bulb types. These questions supplied necessary context for understanding respondents' knowledge of various lighting technologies and allowed us to target questions about particular bulb types to those respondents most able to provide informed opinions on them. When possible, we compared the responses to questions on awareness and familiarity with similar ones from the 2009 to 2011 Massachusetts consumer surveys. We also asked respondents whether they were aware of the EISA light bulb efficiency provisions, but we only compare the 2011 and 2012 results for these questions as questions about EISA awareness asked in previous years used substantially different wording, limiting their comparability to the 2011 and 2012 results.

2.1 CFL Awareness and Familiarity

Approximately nine out of ten respondents in 2012 (89%) indicated that they were aware of CFLs before responding to the survey (Table 2-1). This represents a statistically significant decrease in awareness from the 2011 (92%) and 2010 (94%) surveys but is still within historical rates of awareness measured from 2009 onward (ranging from 87% to 94%).

Table 2-1: Awareness of CFLs

(Base: All respondents)

Awareness	2009	2010	2011	2012
Sample size	*503*	*381*	*582*	*604*
Yes	87%	94%ǂ	92%ǂ	89%*∞
No	13%	6%	8%	11%
Don't know/refused	-	-	-	-

ǂ "Yes" significantly different from 2009 at the 90% confidence level.
∞ "Yes" significantly different from 2010 at the 90% confidence level.
* "Yes" significantly different from 2011 at the 90% confidence level.

More than two out of three respondents in 2012 indicated that they were somewhat or very familiar with CFLs (68%) (Table 2-2). This percentage is similar to that from the 2011 survey (69%). Also similar to the 2011 surveys, however, is the significantly smaller percentage of respondents who reported being "very familiar" with CFLs in 2011 (29%) and 2012 (27%) compared with 2010 (42%) results. The findings continue to point to an increase in the percentage of respondents saying that they were "not too familiar" with CFLs, 17% in 2011 and 16% in 2012. In short, the 2012 surveys confirm the unexpected results of the 2011 survey that appeared to be pointing to lower rates of self-reported familiarity, use, and awareness with CFLs. Later in this report, the Team explores possible reasons for these changes in analyses of exposure to media stories about lighting and reasons for possible changes in CFL satisfaction.

Table 2-2: Familiarity with CFLs

(Base: All respondents)

Familiarity with CFLs	2009	2010	2011	2012
Sample size	*503*	*381*	*582*	*604*
Very familiar	32%	42%ǂ	29%∞	27%ǂ∞
Somewhat familiar	39%	38%	40%	41%
Not too familiar	11%	9%	17%	16%
Not at all familiar	5%	5%	6%	5%
Not aware of CFLs	13%	6%	8%	11%
Don't know / refused	1%	0%	<1%	<1%

ǂ "Very familiar" significantly different from 2009 at the 90% confidence level.
∞ "Very familiar" significantly different from 2010 at the 90% confidence level.

The survey also asked respondents about their familiarity with various types of specialty CFLs, including dimmable, 3-way, flood/recessed, candelabra, globe, and A-line. These levels of familiarity are shown in Table 2-3 on the next page, along with comparisons to familiarity for the same bulb types in 2011 and 2010. Similar to standard CFL familiarity from last year, respondents in 2012 reported an overall decrease in being "very familiar" with specialty CFLs. However, those familiar (very and somewhat) with some specialty CFLs exhibited slight increases. Flood or recessed CFL familiarity rose from 43% in 2011 to 47% in 2012. Similarly, familiarity with candelabra CFLs increased from 35% to 40%. . Furthermore, comparisons between 2010 and 2012 indicate the three year trend in familiarity with specialty CFLs exhibits increases for most specialty bulb types. The differences over time could be attributed to differences in the sample composition, but it is most likely due to the increased attention that the PAs and retailers have given to the diversity of light bulb choices and to the increased availability of specialty bulbs on store shelves.

Table 2-3: Familiarity with Specialty CFLs

(Base: Respondents who had heard of CFLs and were very, somewhat or not too familiar with CFLs)

Type of Specialty CFL	Familiarity	2010	2011	2012
	Sample Size	*381*	*582*	*604*
Dimmable	Very familiar	12%	17%	15%
	Somewhat familiar	19%	23%	25%
	Not too familiar	14%	11%	15%
	Not at all familiar	44%	35%	30%
	Not aware of CFLs	11%	14%	16%
	Don't know / refused	<1%	1%	-
3-way	Very familiar	16%	19%	19%
	Somewhat familiar	20%	25%	27%
	Not too familiar	15%	11%	11%
	Not at all familiar	36%	32%	28%
	Not aware of CFLs	11%	14%	16%
	Don't know / refused	<1%	<1%	-
Flood or Recessed	Very familiar	16%	22%	17%
	Somewhat familiar	16%	21%	30%
	Not too familiar	13%	12%	13%
	Not at all familiar	41%	33%	24%
	Not aware of CFLs	11%	14%	16%
	Don't know / refused	3%	<1%	-
Candelabra	Very familiar	9%	16%	17%
	Somewhat familiar	17%	19%	23%
	Not too familiar	13%	17%	13%
	Not at all familiar	48%	35%	31%
	Not aware of CFLs	11%	14%	16%
	Don't know / refused	1%	1%	-
Globe	Very familiar	18%	20%	19%
	Somewhat familiar	24%	24%	26%
	Not too familiar	13%	16%	15%
	Not at all familiar	33%	27%	24%
	Not aware of CFLs	11%	14%	16%
	Don't know / refused	<1%	<1%	-
A-line	Very familiar	14%	14%	13%
	Somewhat familiar	14%	18%	21%
	Not too familiar	16%	13%	18%
	Not at all familiar	44%	42%	33%
	Not aware of CFLs	11%	14%	16%
	Don't know / refused	1%	<1%	<1%

2.2 Familiarity with other Energy-Savings Bulbs

The past few years saw an influx of screw-in, A-line, light emitting diodes (LEDs) and A-line halogen bulbs (sometimes called energy-efficient incandescents) to the lighting market that were meant to replace incandescent bulbs.[7] For this reason, the recent surveys assessed not only familiarity with CFLs, but with these other energy-saving bulb types as well. Close to one-half (47%) of all 2012 respondents reported being very familiar or somewhat familiar with LEDs, up from 41% in 2011, including a statistically significant increase in those saying they were somewhat familiar with LEDs (Table 2-4). Almost two out of three respondents (65%) reported being very or somewhat familiar with halogens, which is statistically similar to the percentage from the 2011 survey (69%). The team cautions that the percentage of respondents familiar with halogens seems high, at least based on prior focus group research conducted by NMR in Connecticut.[8] The findings from the focus groups indicated that consumers are familiar with certain types of halogen bulbs, including those used in torchieres (frequently remembered as a fire hazard) or as screw-in flood or spotlight bulbs. Yet, very few of the Connecticut focus group participants were familiar with the newest generation of halogen bulbs that closely resemble an incandescent bulb. Based on this prior research, it is the Team's opinion that respondents to the 2011 and 2012 Massachusetts consumer survey may have been indicating their familiarity with other types of halogens—not with those meant to replace incandescents.

Table 2-4: Familiarity with Energy-Saving Bulb Types 2011, 2012

(Base: All respondents)

Familiarity	CFLs		LEDs		Halogen Bulbs	
	2011	2012	2011	2012	2011	2012
Sample size	*582*	*604*	*582*	*604*	*582*	*604*
Very familiar	29%	27%	17%	17%	32%	29%
Somewhat familiar	40%	41%	24%	30%*	37%	36%
Not too familiar	17%	16%	25%	21%	12%	17%*
Not at all familiar	14%	16%	34%	31%	19%	18%
Don't know / refused	<1%	<1%	<1%	<1%	<1%	-

* Significantly different from 2011 at the 90% confidence level.

[7] Halogen bulbs have been on the market for decades, but the 2011 and 2012 surveys focused exclusively on the A-line halogen bulbs meant to replace incandescent bulbs.

[8] NMR Group, Inc. 2011. "Connecticut Lighting Focus Groups: Exploration of Market and Reactions to Various Efficient Lighting Choices."
Available at http://www.ctenergyinfo.com/111121%20EISA%20Lighting%20Focus%20Groups%20Report.pdf

As a further assessment of energy-saving bulb awareness and familiarity, respondents who were somewhat or very familiar with both CFLs and halogens were asked which bulb type used less energy to produce light. Although we must caution that some respondents may have had the wrong type of halogen in mind when answering this question, the majority of 2012 respondents (72%) correctly said that CFLs use less energy than halogen bulbs (Table 2-5), indicating, as did the similar result in 2011, that the respondents' knowledge of energy-saving bulb types goes beyond simple awareness of the bulbs' existence. The remaining respondents were almost evenly split between thinking halogens use less energy, that the two bulbs use the same amount of energy, and being uncertain of which bulb uses less. Similar to the 2011 results, when comparing respondents who self-reported being "very familiar" or "somewhat familiar" with CFLs those most familiar with CFLs in 2012 more frequently identified the CFL as the lower energy user of the two (78% for very familiar vs. 68% for somewhat familiar). Those somewhat familiar with CFLs also tended to choose the CFL in both comparison years, but, a similar proportion of the 2012 respondents instead thought that the two bulbs used about the same amount of energy (10% somewhat familiar vs. 9% very familiar). However, there was a significant increase (3% to 9%) in the percentage of very familiar respondents who thought that CFLs and halogens used about the same amount of energy.

Table 2-5: Respondents' Judgments about Relative Energy Use of CFLs & Halogen Bulbs

(Base: Respondents who were somewhat or very familiar with both CFL and Halogen bulbs)

Which bulb uses less energy	Overall		Very Familiar with CFLs		Somewhat Familiar with CFLs	
	2011	2012	2011	2012	2011	2012
Sample size	*327*	*317*	*156*	*142*	*171*	*175*
CFLs use less energy	70%	72%	81%	78%	63%$^{\Omega}$	68%$^{\Omega}$
Halogens use less energy	9%	10%	9%	8%	10%	10%
They use about the same	9%	9%	3%	9%**	14%	10%
Don't know/refused	11%	9%	7%	6%	14%	12%

* Significantly different from overall at the 90% confidence level.
** Significantly different at the 90% confidence level from 2011 to 2012.
$^{\Omega}$ Significantly different from 'Very Familiar' at the 90% confidence level.

2.3 Awareness of EISA and Media Attention to Light Bulbs

The Federal Energy Independence and Security Act (EISA) of 2007 included new efficiency standards for lighting products. EISA set maximum wattage levels by lumen output for medium screw-base lamps that have a range from 310 to 2600 lumens and are capable of operating at a voltage range of 110 to 130 volts. The standards started to become effective under a phased approach beginning in 2012, and general service bulbs must use 20-30% less energy than current incandescent bulbs according to the timeline and lumen ratings listed in Table 2-6. [9]

Table 2-6: EISA Standards

Rated Lumens	Max Rated Wattage	Min Rated Lifetime (hours)	Effective Date
1490-2600	72	1,000	1/1/2012
1050-1489	53	1,000	1/1/2013
750-1049	43	1,000	1/1/2014
310-749	29	1,000	1/1/2014

The Team asked respondents a series of questions about their exposure to media report about lighting and their awareness of EISA. These questions served two purposes: 1) to gauge awareness of EISA, and 2) to learn more about what consumer hear about lighting products in the media, be it related to EISA or to specific lighting technologies. In fact, one of the impetuses behind the questions about media attention was to find out if consumers had been hearing negative reports about CFLs, a hypothesis NMR put forth when first presenting the 2011 results as a possible reason for changes in self-reported CFL use and satisfaction (see Section 3.2 and Section 7.2).

The current survey found that almost one-half (45%) of the respondents indicated that they had heard news stories about lighting products in the past year (Table 2-7).

Table 2-7: Whether Has Seen or Read any News Stories about Light Bulbs in Past Year

(Base: All Respondents)

Has seen/heard news stories about light bulbs in past year?	2012
Sample size	*604*
Yes	45%
No	54%
Don't know/refused	1%

[9] The EISA standards are being phased in over the next three years. In December 2011, the U.S. Congress defunded enforcement of the EISA Title III light-bulb performance requirements as part of the Consolidated Appropriations Act in the 2012 federal budget. The new standards and regulations remain law despite the fact they are currently not enforced. Accessed here:
http://www.energystar.gov/ia/products/lighting/cfls/downloads/EISA_Backgrounder_FINAL_4-11_EPA.pdf

Those having heard lighting-related news stories were asked to recall what the news story was about. Thirty percent of respondents mentioned they had heard that traditional bulbs were being taken off the market or phased out (Table 2-8), indicating awareness of the EISA legislation. about one-fourth (24%) of respondents reported that they had hear that new bulbs were more energy efficient, while others (5%) noted that the media story suggested that consumers should be switching over to more efficient lighting. Turning to the question of media attention to CFLs, 19% of respondents had heard that CFLs were dangerous because of mercury and needed careful disposal, and another 6% said they hear that many consumers did not like CFLs. These results indicate that, in fact, some consumer have been exposed to negative press about CFLs. In Section 7.2, we explore whether exposure to these stories has influenced satisfaction with CFLs. Other responses noted comparisons between "old" and "new" bulbs, the long life and price of efficient lighting, the positive aspects of LED lighting, and the increased diversity of bulbs on the market.

Table 2-8: Information Remembered in News Stories about Light Bulbs

(Base: Respondents having heard lighting news)

What respondent remembers seeing or reading in the stories about light bulbs (Multiple Response)	**2012**
Sample size	*295*
Traditional bulbs are being taken off the market/phased out	30%
New bulbs are more energy efficient	24%
CFLs are dangerous because of mercury/disposal	19%
How new bulbs compare to older bulbs in terms of wattage/price/brightness	13%
LED/CFLs last longer but are more expensive	12%
Positive aspects of LEDs/We should be using LEDs	7%
Many consumers do not like CFLs	6%
We should be switching over to efficient lighting	5%
New bulbs coming on the market	4%
New bulbs come in different shapes	1%
Other	9%
Don't know/refused	3%

The 2011 and 2012 surveys also directly asked respondents' about their awareness of the EISA legislation that bans most incandescent light bulbs. Despite the fact that the top lighting-related news story respondents' recalled was about the incandescent phase-out (Table 2-8), only two out of five (42%) of all 2012 respondents had heard of EISA compared with the 47% of respondents in 2011(Table 2-9). This statistically significant decrease in EISA awareness, however, may be related to the timing of the two surveys—the 2011 survey was in the field when the 100 Watt phase-out went in effect; the 2012 survey occurred six month later when the phase-out was getting less media attention. Various sections later in this report address information regarding current and likely consumer responses to EISA, including possible stockpiling behavior (Section 6.2) and probable bulb purchases in response to EISA (Section 6.1).

Table 2-9: Awareness of EISA Law

(Base: All Respondents)

Have heard about EISA law	**2011**	**2012**
Sample size	*582*	*604*
Yes	47%	42%*
No	53%	58%*
Don't know/refused	-	-

* Significantly different from 2011 at the 90% confidence level.

3 Use of Various Lighting Technologies

The survey queried respondents about their past and current uses of various lighting technologies. These questions served three purposes. First, they established the types of bulbs customers self-reported using just prior to the start of the EISA implementation period (late 2011) compared with the 2012 sample. Second, they provided insight into why customers choose to use or not to use certain types of lighting products as well as how they used the products they did have installed. Finally, the questions helped us determine which respondents had the knowledge and experience necessary to answer more in-depth questions about bulb purchase habits, a topic addressed in Section 4.

3.1 Incandescent Bulb Use

Due to the phased aspect of EISA, the Team has been tracking customer use, saturation, and purchase of incandescent bulbs that would be subject to the current EISA regulations. For 2012, this means 100 Watt incandescents only, although in third wave of the consumer survey and the second onsite saturation study, we will expand our analyses to include 75 Watt incandescent bulbs. In order to ask telephone survey respondents about their recent experiences shopping for incandescent bulbs, we first had to establish whether the respondents actually used 100 Watt incandescent bulbs. Only 26% of the 2012 survey respondents self-reported that they had any 100 Watt incandescent bulbs installed in their home, a 4% decrease from the 2011 sample (Table 3-1). Those reporting they did not have any 100 Watt incandescents installed reported so at a significantly higher percentage than last year (72% versus 62%, respectively). Importantly, the 2012 onsite study found that 51% of onsite homes had 100 Watt incandescents installed, but these accounted for only about three percent of all sockets in the onsite homes.

Table 3-1: 100 Watt Incandescent Bulbs Installed in Home

(Base: All Respondents)

Any 100 watt incandescent bulbs installed in home?	**2011**	**2012**
Sample size	*582*	*604*
Yes	30%	26%
No	62%	72%*
Don’t know/refused	8%	3%

* Significantly different from 2011 at the 90% confidence level.

The most common reason for why 2012 respondents did not use 100 Watt incandescents was that the bulbs were too bright (28%),with another 24% specifically noting they preferred to use more energy-efficient types of bulbs (Table 3-2). One interesting shift between 2011 and 2012 is the way in which respondents discussed their choice of more efficient bulbs: The 2012 respondents were significantly more likely than 2011 to mention that they choose to use more efficient bulb types (24% vs. 17%) but less likely to say that the 100 Watt incandescent bulbs used "too much energy" (18% vs. 28%). In essence, these two statements lead to the same result—great use of more efficient bulb types—but represent different ways of explaining the behavior. The 2012 survey respondents were also significantly more likely to say that they prefer to use lower wattage incandescent bulbs (21% in 2012 vs. 11% in 2011) or that their socket does not accept 100 Watt bulbs (14% in 2012 vs. 6% in 2011). Note that a handful of respondents in both years (about 1%) specifically cited EISA as a reason that they did not use 100 Watt incandescents.

Table 3-2: Reasons 100 Watt Incandescent Bulbs Not Installed in Home

(Base: Respondents who do not currently use 100 Watt incandescent bulbs in their homes)

Reasons (Multiple Response)	**2011**	**2012**
Sample size	*350*	*410*
They are too bright	26%	28%
I use CFLs/halogens/efficient lighting	17%	24%*
Prefer to use a lower wattage incandescent	11%	21%*
They use too much energy	29%	18%*
My socket says only to use a certain Watt bulb/ fixtures won't take such high wattage	6%	14%*
Don't need them	16%	13%
Cost too much/want to save money	6%	5%
They are bad for the environment/not energy conscious	2%	1%
Because of EISA	1%	<1%
Landlord chose bulbs/bulbs were already here	1%	3%
They are too hard to find/Can't find them	-	3%
They don't last long/short bulb life	1%	1%
Other	2%	2%
Don't know/refused	7%	3%

* Significantly different from 2011 at the 90% confidence level.

To get a sense of whether respondents still used incandescents, even if they did not use the 100 Watt variety, respondents who did not have a 100 Watt bulb installed revealed whether they had *any* incandescents installed. As shown above (Table 3-1), the majority of 2012 respondents did not use 100 Watt incandescents, but among this group roughly two out of three (63%) reported that they did use other wattages of incandescent bulbs (Table 3-3). However, 34% of respondents who did not use 100 Watt incandescents reported that they did not use incandescents whatsoever. Looking at the entire sample and taking into account use of 100 Watt incandescents (or lack thereof), a similar number (64%) of respondents said that they used at least some wattage incandescents in their home. This is significantly different than the 75% of all 2011 respondents who indicated they used 100 Watt bulbs as well as other incandescents.

Table 3-3: Any Incandescent Bulbs Installed in Home

(Base: Respondents who do not currently use 100 Watt incandescent bulbs in their homes and all respondents)

Incandescent bulbs installed?	Households not Using 100 Watt Incandescents**		All Households	
	2011	2012	2011	2012
Sample size	*387*	*410*	*582*	*604*
Yes	63%	63%	75%	64%*
No	34%	34%	23%	33%*
Don't know/refused	3%	3%	2%	3%
Currently using 100 Watt incandescent	-	-	-	-

* Significantly different from 2011 at the 90% confidence level.
** The percentages in both years are the same (once rounded).

3.2 CFL Bulb Use

The survey also explored historic and current self-reported CFL use, comparing the results to those from 2009 to 2011 when possible. In the current survey, 64% of respondents had CFLs installed in their homes at some point—a similar percentage to 2011, but a decrease from 2010 and 2009, when 78% and 68% of respondents indicated having had CFLs installed respectively (Table 3-4). Similarly, 19% of respondents in 2012 revealed never having had CFLs installed compared with the 20% of respondents in 2011 (Table 3-4).

Table 3-4: CFLs Ever Installed in Home

(Base: All respondents)

Have Ever Used a CFL	2009	2010	2011	2012
Sample size	*503*	*381*	*582*	*604*
Yes	68%	78%	61%	64%
No	12%	11%	20%	19%
Don't know/Refused	1%	<1%	6%	1%
Not aware of / familiar with CFLs	19%	11%	14%	16%

The 2012 survey respondents who have used CFLs were asked to specify how long ago they first used a CFL. A majority of respondents self-reported using CFLs for the first time between one and four years ago (55%) (Table 3-5). Only 5% specified they began using them more than ten years ago, with a similarly small percentage (7%) reporting their first use within the past year. The team did not ask this question in 2011, but the results are consistent with self-reported first use of CFLs in the 2009 and 2010, in that first use of CFLs is relatively recent, but the percentage using CFLs for more than four years has tended to increase over time.[10]

Table 3-5: When First Used a CFL

(Base: Respondents who have ever used a CFL)

How long ago first used a CFL bulb?	2012
Sample size	*414*
Less than one year ago	7%
1 to 2 years ago	29%
to 4 years ago	26%
5 to 6 years ago	16%
7 to 8 years ago	6%
9 to 10 years ago	7%
More than 10 years ago	5%
Don't know/Refused	4%

[10] See NMR *Results of the Massachusetts and Pennington County, South Dakota Telephone and Onsite Compact Fluorescent Lamp Surveys*. Delivered to the PAs and EEAC Consultants on April 15, 2011.

The current and prior surveys also asked respondents to self-report whether they currently use any CFLs in the home. In the current sample, 55% of respondents self-reported having CFLs installed, which is the same percentage as in 2011, which represents a significant decrease from the 2010 and 2009 samples, in which 72% and 64% of respondents had CFLs respectively (Table 3-6). However, a significant number of the 2012 respondents reported they do not currently have CFLs installed over the 2011 sample (8% versus 5%, respectively). Importantly, the low rates of self-reported CFL use stand in contrast to the results of the onsite study in which a trained technician found the percentage of homes using at least one CFL to be 96% in early 2012, demonstrating that the self-reported decrease in CFL use does not reflect respondents' actual behavior. Consumers may be confused about what constitutes of CFL bulb or their responses have been influenced by other factors, leading to the contradictory self-reported responses and onsite verified use.

Table 3-6: CFLs Currently Installed in Home

(Base: All respondents)

Currently Have CFLs Installed	2009	2010	2011	2012
Sample Size	*503*	*381*	*582*	*604*
Yes	64%	72%ǂ	55%ǂ ʊ	55%ǂ ʊ
No	3%	6%	5%	8%∞
Don't know / refused	1%	0%	1%	<1%
Not aware of / familiar with CFLs*	32%	22%	39%	36%

*Includes respondents who said they did not know if they ever used a CFL.

ǂ Significantly different from 2009 at the 90% confidence level.

ʊ Signficantly different from 2010 at the 90% confidence level.

∞ Significantly different from 2011 at the 90% confidence level.

In order to explore reasons why some households may stop using CFLs, the 2012 respondents who said that they once had CFLs installed but no longer utilize them further indicated why this is the case. Only 34 respondents indicated that they had stopped using CFLs, and these respondents provided multiple responses so the totals sum to more than 100%. Almost one-half (47%) of these 34 respondents indicated that they had moved homes or were now renting, and that bulbs other than CFLs were already installed (Table 3-7). This is an optimistic finding given that their switch from efficient lighting was not the result of concerns about CFLs, but simply the circumstance of switching residences, although it certainly would be preferable if these respondents or their landlords chose efficient lighting. Further, another 32% of the sample indicated that they prefer other efficient lighting choices such as LEDs, which is also an optimistic finding from an efficiency perspective. An equal number of respondents (32%) mentioned that someone else purchases the light bulbs in their homes. Yet, a sizable percentage (84%) of respondents still voiced at least some concerns over actual price, performance, or disposal issues of CFLs; the concerns mentioned varied so that no single response garnered more than 12% of all reasons offered for discontinued CFL use by the survey respondents.

Table 3-7: Reasons for No Longer Using CFLs

(Base: Respondents who have ever used a CFL but do not currently have any installed)

Why no longer have CFLs installed? (Multiple Response)	**2012**
Sample size	*34*
Non-Performance or CFL Price Issues	*111%*
Moved/renting and bulbs were already there	47%
Someone else buys/replaces them	32%
Prefer LEDs/other efficient lighting choices	32%
CFL Performance or Price Issues	84%
Price/expense	12%
Poor light color	12%
Broke too easily	9%
Did not like the look/appearance of CFLs	9%
Mercury/disposal issues	9%
Shorter bulb life than promised	9%
Did not work with fixtures	6%
Not bright enough	6%
Inadequate for my needs	3%
Did not work well	3%
Went back to/prefer incandescents	3%
The long warm up time	3%
Other	
Don’t know/Refused	15%

Respondents also self-reported their use of dimmable CFLs. Most 2012 respondents (82%) did not have dimmable CFLs installed, but 18% utilized dimmable CFLs in their homes (Table 3-8). These results are very similar to the 2011 survey.

Table 3-8: Use of Dimmable CFLs in the Home

(Base: All respondents)

Dimmable CFLs currently installed	2011	2012
Sample size	*582*	*604*
Yes	16%	18%
No	83%	82%
Don't know/Refused	1%	<1%

3.3 Alternative Lighting Technologies

The 2011 survey established baseline use of the types of screw-in LEDs meant to replace incandescent bulbs. Similarly to 2011, only 16% of respondents self-reported using LED screw-in bulbs currently installed in their homes (Table 3-8). The percentage is greater than the seven percent of household found using LEDs during the onsite visits—and the onsite percentage includes all types of LEDs such as A-line screw-in bulb but also the cabinet and night lights.

Table 3-9: LED Screw-In Bulbs Installed in Home

(Base: All respondents)

Any LED bulbs currently installed?	2011	2012
Sample size	*582*	*604*
Yes	16%	16%
No	79%	81%
Don't know/Refused	5%	3%

Respondents who self-reported having screw-in LEDs currently installed also described the types of fixtures they were installed in. The most frequent response was floor, table, and portable lamps, named by roughly two out of three respondents (64%) (Table 3-10). Ceiling and overhead lighting was mentioned by more than one out of four respondents (27%) while outdoor and general lighting were each mentioned by 8% of respondents.[11]

Table 3-10: Types of Fixtures or Lamps with Installed LED Bulbs in Home--2012

(Base: Respondents who said they had an LED screw-in bulb installed in their home)

Fixture/Lamp type	2012
Sample size	*101*
Floor/table portable lamps	64%
Ceiling/Overhead Lighting	27%
Outdoor	8%
General lighting/wherever I can	8%
Ceiling fans with lighting	6%
Recessed lighting	3%
Basement/cellar/utility spaces	3%
In an appliance	2%
Track lighting	2%
Vanity	1%
Chandelier	1%
Nightlights	1%
Pendant/hanging	1%
Holiday lighting/candle	0%
Other	4%
Don't know/Refused	2%

[11] The Team asked a similar question in the 2011 survey but responses focused on technical definitions of fixture types, and interviewers unfamiliar with fixture types mislabeled responses. The 2012 survey relied on more colloquial language for describing fixture types, making the task of identifying fixtures easier for respondents and interviewers, even if the terminology is not as exact as that used professionally.

4 Recent Lighting Purchases

The team fielded the first wave of the consumer survey in late 2011 and early 2012, just at the time of EISA implementation of the phase-out of 100 Watt incandescent bulbs, allowing the Team to establish a baseline at the onset of EISA implementation about preferences for certain bulb types and likely consumer reactions to the phase-out of most incandescent bulbs. The 2012 (wave 2) consumer survey completed in June repeated these questions in order to track changes during the first six months of EISA implementation.[12]

4.1 Recent Purchase History of Incandescent Bulbs

In order to assess whether respondents had noticed any changes in the availability of 100 Watt incandescent bulbs, we asked whether they had looked for 100 Watt incandescent bulbs in the past three months. Those who had shopped for 100 Watt incandescent bulbs were then asked a series of questions about their shopping and purchasing experiences.

4.1.1 Shopping for 100 Watt Incandescent Bulbs

Only 14% of respondents indicated that they had shopped for 100 Watt incandescent bulbs in the past three months (Table 4-1) in both the 2011 and 2012 surveys. However, it should be remembered that only 26% of the 2012 households recalled using 100 Watt incandescent bulbs, so it is not surprising to find so few respondents shopping for them in the past three months (see Table 3-1 above).

Table 4-1: Whether Respondents Had Looked for 100 Watt Incandescents in the Past Three Months

(Base: All respondents)

Looked for 100 Watt incandescent bulbs in past 3 months	2011	2012
Sample size	*582*	*604*
Yes	14%	14%
No	85%	86%
Don't know/Refused	1%	<1%

[12] Note that the third wave of the consumer survey will continue asking about 100 Watt incandescent bulbs and introduce questions about 75 Watt bulbs, which will be phased out in 2013.

Those respondents who had looked for 100 Watt incandescent bulbs then indicated whether they had been successful in their attempt to purchase them. The findings point to evidence that the phase-out has begun to affect consumers' ability to find 100 Watt incandescents on store shelves. In 2011, more than three out of four respondents (77%) who had attempted to purchase these bulbs found them on store shelves, but, n contrast, only 63% of 2012 respondents shopping for 100 Watt incandescents found them on the shelves in the three months prior to the 2012 survey (Table 4-2).

Table 4-2: Whether Respondents Had Found 100 Watt Incandescent Bulbs on Retailers Shelves in the Past Three Months

(Base: Respondents who said they had looked for 100 Watt incandescent in the past three months)

Response	2011	2012
Sample size	*84*	*84*
Yes – went to a store and found them on the shelves	77%	63%*
No – went to a store and could NOT find them on the shelves	15%	28%*
Don't know/Refused	8%	9%

* Significantly different from 2011 at the 90% confidence level.

The respondents who did not find 100 Watt incandescent bulbs on retailer's shelves in their first attempt noted whether they had looked elsewhere for the bulbs. Four 2012 respondents went to another store to find the bulbs, and did so successfully (Table 4-3). The majority, however, did not go to another store or otherwise try to locate the bulbs further.

Table 4-3: Whether Respondents Had Looked Elsewhere for 100 Watt Incandescent Bulbs If Not Found at Retailer

(Base: Respondents who had looked for 100 Watt incandescent in the past three months but had not found them)

Looked for 100 Watt incandescents elsewhere (unweighted counts)	2011	2012
Sample size	*14*	*25*
Yes, went to another store	2	4
Yes, went to look on the internet	0	0
Yes, both stores and internet	0	0
No, did not go to another store or look on the internet	12	21

4.1.2 Types of Bulbs Purchased when Shopping for 100 Watt Incandescents

Of the respondents who had found 100 Watt incandescent bulbs on store shelves in the past three months, only 39% reported purchasing those bulbs, representing a significant decline in the purchase of 100 Watt bulbs from the 2011 sample (Table 4-4).[13]

Table 4-4: 100 Watt Incandescent Bulbs Purchased in Past Three Months

(Base: Respondents who said they had found 100 Watt incandescent in a retail store or elsewhere)

Purchased 100 Watt incandescents in past 3 months?	2011	2012
Sample size	*71*	*61*
Yes	56%	39%*
No	43%	60%*
Don't know/Refused	2%	1%

* Significantly different from 2011 at the 90% confidence level.

The 31 respondents who had not found 100 Watt incandescent bulbs in 2012 also reported whether they had purchased other light bulbs instead of the 100 Watt incandescent in the past three months. Eighteen of these respondents indicated that they had purchased a different type of light bulb while the other thirteen had not (Table 4-5).

Table 4-5: Whether Purchased Light Bulbs Instead of 100 Watt Incandescent in Past Three Months

(Base: Respondents who said they had not found 100 Watt incandescents in a retail store or elsewhere)

Purchased instead of 100 Watt incandescent in past 3 months	2011	2012
Sample size	*22*	*31*
Yes	12	18
No	9	13
Don't know/Refused	1	-

[13] NMR recommends adding a follow-up question in the Wave 3 survey to find out why some respondents who find 100 Watt—and 75 Watt—incandescent bulbs decide not to buy them.

The eighteen respondents in 2012 who bought a different type of light bulb most often chose an incandescent bulb of another wattage (10 respondents) followed by a CFL (seven respondents) (Table 4-6). Although the CFL was the most popular alternative choice in 2011, the small sample sizes do not allow us to draw any statistically significant conclusions about changes in this purchase behavior from the 2011 baseline. Only two respondents in 2012 mentioned halogens and one named an LED. Note that the totals sum to more than 18 responses because some respondents purchased more than one type of bulb instead of a 100 watt incandescent.

Table 4-6: Type of Bulb Purchased Instead of 100 Watt Incandescent

(Base: Respondents who said they had not purchased a 100 Watt incandescent in the past three months)

Type of Bulb (Multiple Response, unweighted counts)	2011	2012
Sample size	*12*	*18*
Incandescent bulbs of another wattage	8	10
CFLs	9	7
Halogen bulbs	4	2
LEDs	1	1
Night Light, spotlights	2	0
Don't know/Refused	0	1

The ten respondents in 2012 who reported purchasing an incandescent bulb of wattage also reported what wattage bulb they chose; again, the total number of responses sums to more than ten because respondents bought more than one wattage of incandescent. An equal number (two each) of respondents indicated choosing a lower wattage incandescent bulb than the 100 Watt they had been looking for (75 and 60 Watt, respectively), while five respondents mentioned they chose three-way bulbs instead (Table 4-7). It should be noted that the three-way bulbs purchased may have included the 100 Watt option, though optimistically, no respondents indicated purchasing the 150 watt incandescent. Importantly, three-way bulbs are not subject to EISA and represent a way that a consumer can circumvent the phase-out and still get the brightness of a 100 Watt incandescent.

Table 4-7: Wattage of Incandescent Bulb Bought Instead of 100 Watt Incandescent

(Base: Respondents who said they had purchased an incandescent bulb of another wattage)

Wattage (Multiple Response, unweighted counts)	2011	2012
Sample size	*8*	*10*
75 Watt	4	2
60 Watt	3	2
40 Watt	2	1
25 Watt	1	0
150 Watt	1	0
3-way	1	5
Don't know/Refused	0	0

4.2 Purchase of All Types of Light Bulbs

The survey also asked about the purchase of all types of light bulbs, not just 100 Watt incandescents. Including the bulb purchase behavior of the respondents discussed above who had at least shopped for 100 Watt incandescent bulbs, we find that 42% of the 2012 sample purchased some type of light bulb in the past three months, a significant decline of 5% from the 2011 sample (Table 4-8), which likely reflects the seasonality of lighting purchases. In other words, more household bought light bulbs in the 2011 survey because it was fielded in early winter, rather than the late spring time period of the 2012 survey.

Table 4-8: Light Bulb Purchases in the Past Three Months

(Base: All respondents)

Purchased a bulb in past 3 months?	**2011**	**2012**
Sample size	*582*	*604*
Yes	47%	42%*
No	53%	58%*
Don't know/Refused	<1%	1%

* Significantly different from 2011 at the 90% confidence level.

Table 4-9 on the next page summarizes the types of bulbs purchased by respondents that had bought bulbs in the past three months, including those discussed in Section 4.1.2. Note that only respondents who had previously reported familiarity with the relevant bulb type were asked these items. Therefore, it is possible that respondents purchased more bulbs than indicated here, but we could not inquire about these purchases as they had not indicated familiarity with all bulb types. Although sample sizes differed between several of the bulb types examined, the highest recorded percentage of purchases for the 2012 sample were for incandescents (58% of aware purchasers, 23% of all respondents) followed by CFLs (49% of aware purchasers, 15% of all respondents). Halogen bulbs (18% of aware purchasers, 6% of all respondents), pin-based fluorescent tubes (17% of purchasers, 7% of all respondents), and LEDs (13% of aware purchasers, 3% of all respondents) were also popular choices. Compared with the 2011 results, the percentage of 2012 purchases of all bulb types, except incandescents and pin based fluorescent tubes, have declined, but again, this may reflect a seasonality issue more than changes in behavior. Comparisons to the Wave 3 survey to be fielded during the same season as the Wave 1 survey may provide more clarification on this issue.

Table 4-9: Type of Bulb Purchased in the Past Three Months

(Base: Respondents who said they had purchased any light bulbs in the past three months and were aware of relevant bulb type; and all respondents)

Type of Bulb (Multiple Response)	Sample Size		Percent of Respondents Asked Question		Percent of All Respondents (n = 582; 604)	
	2011	2012	2011	2012	2011	2012
CFLs that screw into regular light sockets	250	196	65%	49%*	24%	15%*
Incandescent or regular light bulbs	359	238	57%	58%	25%	23%
Halogen bulbs that screw into regular light sockets	236	200	26%	18%*	9%	6%*
Pin-based fluorescent tubes that can only be used in fluorescent light fixtures	300	269	16%	17%	8%	7%
LEDs that screw into regular light sockets	164	134	18%	13%	4%	3%
Pin-based CFLs that can only be used in special light fixtures$^{\Omega}$	300	203	10%	8%	5%	3%*
Pin-based LEDs that can only be used in special light fixtures$^{\Omega}$	300	137	5%	3%	2%	1%
Other bulbs mentioned						
Pin-based Halogens	2	5	N/A**	-	N/A**	-
Flood lights	5	7				
Strip or under cabinet LED	2	1				
Holiday/string lighting	2	1				
Automotive bulbs/headlights	3	4				
Bulb for recessed lighting	3	2				
High pressure sodium lights	1	0				
Other	4	10				

* Significantly different from 2011 at the 90% confidence level.

** Number of respondents naming other bulbs types is too small to report percentages.

$^{\Omega}$ Survey altered in 2012 to limit this question to respondents previously aware of CFLs and LEDs, hence the lower sample sizes.

5 Key Lighting Concepts

The gradual phase-out of most incandescent bulbs will likely change the way that consumers shop for light bulbs. Instead of searching for "100 Watt" bulbs and their equivalents, consumers will instead be presented with labels and educational materials that reference lumens, color temperature, annual operating costs, and other bulb life. The survey included multiple questions to gauge what consumers currently consider when buying light bulbs and their knowledge of key lighting concepts.

5.1 Information Considered when Buying Light Bulbs

We asked respondents two questions about the type of information that they currently look for on bulb packing when buying light bulbs; the first question was open-ended, allowing the consumer to name any information they desired, while the second asked about specific characteristics. For example, if a respondent had not mentioned "price" during the unprompted portion, they were later asked if the price of the bulb is something they actually do look for. We report both the percentage of the entire sample who gave each response unprompted, and the percentage of the entire sample who gave each response when prompted. The most popular unprompted response in 2012 was the wattage of the bulb (54%) which was also mentioned by 42% of respondents in the prompted follow-up (Table 5-1 on the next page). Following the 2011 pattern of responses, in 2012 wattage was the only characteristic mentioned more frequently unprompted than prompted by the interviewer. This suggests that educational campaigns and information at the point of purchase will be vital in helping consumers transition from a focus on the familiar incandescent wattage to lumens when purchasing bulbs. Also mentioned with high frequency both unprompted and prompted were the price (26% and 66%, respectively) and the bulb life (13% and 51%, respectively). Prompted, respondents also noted that they looked for wattage equivalency (61%), bulb shape (59%), and the ENERGY STAR label (55%).

Table 5-1: Information Looked for on Bulb Packaging

(Base: All respondents)

Information on packaging (Multiple Response)	Unprompted Response		Prompted Response		Total Prompted and Unprompted	
	2011	2012	2011	2012	2011	2012
Sample Size	*582*	*604*	*582*	*604*	*582*	*604*
Wattage	50%	54%	44%	42%	94%	96%
Price	25%	26%	66%	66%	91%	92%
Watt equivalency	5%	9%*	69%	61%*	74%	70%
Bulb life	14%	13%	47%	51%	61%	64%
Shape	3%	5%*	56%	59%	59%	64%*
ENERGY STAR label	9%	6%*	55%	55%	64%	61%
Color appearance, color temperature, Kelvin	6%	9%*	49%	45%	55%	54%
3-way	1%	1%	39%	44%*	40%	45%*
Lumens, brightness, light output	10%	11%	20%	19%	30%	30%
Dimming	1%	<1%	25%	26%	26%	26%
UL, or Underwriters Laboratories label	<1%	<1%	21%	25%	21%	25%
Lighting facts/energy facts label	3%	4%	20%	17%	23%	21%
CRI, or color rendition index	1%	1%	12%	12%	13%	13%
Mercury content	<1%	1%	13%	12%	13%	13%
Energy usage/energy efficiency/savings on bill	10%	7%*	N/A	N/A	10%	7%*
Bulb size, base size	5%	6%	N/A	N/A	5%	6%
Brand	3%	5%*	N/A	N/A	3%	5%
Matches bulb being replaced, appropriate for my needs	3%	4%	N/A	N/A	3%	4%
Type of bulb	4%	3%	N/A	N/A	4%	3%
Where made	1%	1%	N/A	N/A	1%	1%
Environmentally friendly	1%	1%	N/A	N/A	1%	1%
Nothing	1%	4%*	N/A	N/A	1%	4%*
Savings on energy bill	<1%	2%	N/A	N/A	<1%	2%
Incandescent only	<1%	<1%	N/A	N/A	<1%	<1%
Don't know/Refused	7%	4%*	N/A	N/A	7%	4%
Other	4%	3%	N/A	N/A	4%	3%

* Significantly different from 2011 at the 90% confidence level.

5.2 Lumens and Color Temperature

The survey included questions to assess respondents' knowledge of two key lighting concepts—lumens and color appearance. Specifically, the survey asked whether respondents had seen or heard of the term "lumens" or "warm white" and "cool white" in relation to lighting. The majority of 2012 respondents (67%) indicated that they had seen or heard the terms "warm white" and "cool white" while 55% had seen or heard of the term "lumens"(Table 5-2). Awareness in 2012 was statistically similar to awareness in 2011.

Table 5-2: Whether Respondents Had Seen or Heard the Term "Lumens", "Warm White" and "Cool White"

(Base: All Respondents)

	Have Heard of Lumens		Have Heard "Warm White" and "Cool White"	
	2011	**2012**	**2011**	**2012**
Sample size	*582*	*604*	*582*	*604*
Yes	53%	55%	64%	67%
No	46%	45%	35%	33%
Don't know/Refused	1%	-	1%	1%

However, just because the majority of respondents had heard these key lighting terms before the survey does not mean that they understand what they meant. For this reason, we asked those respondents who had seen or heard of the terms "lumens", "warm white" and "cool white" to define them. Table 5-3 shows that the majority of respondents familiar with the term lumens (74% of those asked or 45% of all 604 respondents in 2012) correctly understood that the term refers to light output or brightness, and, again, the responses are very similar between 2011 and 2012.

Table 5-3: Understanding of the Term "Lumens"

(Base: Respondents who said they had seen or heard the term "lumens")

Respondents' understanding of "lumens" (Multiple Response)	**2011**	**2012**
Sample size	*370*	*370*
Light output or brightness	74%	74%
Unit of measure of lighting	2%	1%
Distance light will penetrate	2%	1%
Candlelight	2%	3%
Light color	1%	1%
The same as Watts	1%	3%
Quality of light	1%	1%
Energy emitted	1%	1%
Efficiency	<1%	<1%
Company or brand	-	2%
Other	3%	2%
Don't know/Refused	16%	16%

As with the term "lumens," those respondents who had heard the terms "warm white" and "cool white" also demonstrated a strong understanding of the term (83% of those asked or 60% of all 604 respondents), noting that it referred to the color appearance of the light (Table 5-4). Despite the high levels of familiarity with the terms, the 2012 sample actually displayed lower familiarity than the 2011 sample, in which almost every respondent correctly identified "warm white and cool white." A greater number of the 2012 respondents mentioned "related to your eyes/how eyes perceive the light" as a description for "warm white" and "cool white" accounting for some of the difference. In other words, an increasing percentage of respondents seem to be confusing "color rendition" and "color appearance."

Table 5-4: Understanding of the Terms "Warm White" and "Cool White"

(Base: Respondents who said they had seen or heard the terms "warm white" and "cool white")

Respondents' understanding of "warm white" and "cool white" – as in the color white (Multiple Response)	**2011**	**2012**
Sample size	*426*	*434*
Color appearance	92%	83%*
Heat of the bulb	5%	5%
Fluorescent/one resembles fluorescent light	3%	2%
Relates to your eyes/how your eyes perceive the light	1%	7%*
Wavelength spectrum of the light	1%	3%
Coated vs. clear bulb	1%	2%
The way you look in the bulbs light	<1%	<1%
Other	4%	3%
Don't know/Refused	14%	15%

* Significantly different from 2011 at the 90% confidence level.

6 Potential Reactions to EISA

The survey asked a series of questions to ascertain respondents' likely bulb choice after 100 Watt incandescent bulbs are no longer available. The Team stresses that these findings are based on self-reported reactions to hypothetical situations described in a survey. Actual purchase behavior when faced with choices at the point of purchase could be very different from those reported here.

6.1 Bulb Choice under EISA

More than two out of five respondents (41%) in the 2012 sample said they would most likely choose a lower wattage incandescent bulb to purchase instead of a 100 Watt incandescent bulb, differing significantly from the 34% of respondents mentioning this choice in 2011 (Table 6-1). Roughly one in four respondents (27%) in 2012 indicated they would choose a 23 Watt screw in CFL as their second choice, which is a smaller percentage than in 2011, but significantly so. Approximately one in ten respondents would choose a 72 Watt screw-in halogen or a 17 Watt screw-in LED. Only 4% of the sample would choose the least efficient option offered, a 150 Watt incandescent. Thus, the results indicate a greater preference among the 2012 respondents than 2011 respondents for continuing to buy incandescent bulbs over other bulb types. It is unclear why more 2012 respondents chose the lower wattage incandescent over the more efficient options than 2011 respondents. The proclivity to buy and save extra 100 Watt incandescent bulbs is explored in Section 6.2.

Table 6-1: Bulb Choice under EISA

(Base: All Respondents)

Bulb type	2011	2012
Sample size	*582*	*604*
A lower wattage incandescent bulb	34%	41%*
A 23 Watt screw-in CFL bulb meant to replace a 100 Watt incandescent bulb	30%	27%
A 72 Watt screw-in halogen bulb meant to replace a 100 Watt incandescent bulb	13%	11%
A 17 Watt screw-in LED bulb meant to replace a 100 Watt incandescent bulb	10%	10%
A 150 Watt incandescent bulb	4%	4%
Don't know/refused	9%	8%

* Significantly different from 2011 at the 90% confidence level.

All respondents, regardless of bulb choice under EISA, received a follow-up question asking their reasons for choosing the particular bulb they favored. A popular response of both the 2011 and 2012 respondents across all bulbs was a preference for that bulb's particular light, color temperature, or brightness (mentioned by 68% of those choosing a 150 Watt incandescent, 34% of those choosing a lower wattage incandescent, 18% of those choosing a 17 Watt LED, 30% of those choosing a 72 Watt halogen, and 19% of those choosing a 23 Watt CFL in 2012) (Table 6-2). Similar to last year, this was the most popular response for the lower wattage incandescent, the 150 Watt incandescent (only 25 respondents, but they appeared to be very loyal to incandescent bulbs), and the 72 Watt halogen. Alternatively, the most popular response for choosing the 17 Watt LED or 23 Watt CFL was that these bulbs used less energy or were more efficient (mentioned by 29% and 38% of those choosing the bulbs respectively). The long bulb life of the LED was also a popular reason for choosing it (25%) indicating that respondents are aware of this benefit of the LED. Familiarity with particular bulb types, fitting the necessary fixtures, the low price of bulbs, and lowering one's energy bills, were also popular choices across bulbs.

Table 6-2: Reasons for Bulb Choice under EISA

(Base: Respondents who said they would most likely use relevant bulb type)

Reasons (Multiple Response)	Lower wattage incandescent		23 Watt CFL		72 Watt Halogen		17 Watt LED		150 Watt Incandescent	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
Sample size	*191*	*204*	*190*	*190*	*58*	*66*	*56*	*65*	*23*	*25*
Prefer this light/color temperature/brightness	33%	34%	12%	19%*	35%	30%	34%	18%*	65%	68%
Uses less energy/efficient	20%	21%	49%	38%*	10%	26%*	44%	29%*	6%	4%
Familiar with/already use this bulb	13%	28%*	17%	10%*	8%	12%	17%	12%	7%	8%
Fit fixtures/recommended for fixture	8%	18%*	4%	4%	6%	3%	0%	5%	0%	4%
Low price/on sale	9%	7%	7%	9%	4%	2%	5%	2%	6%	0%
Lower energy bills	8%	5%	7%	10%	17%	2%*	10%	12%	0%	0%
Warm up quicker	2%	1%	<1%	1%	1%	2%	2%	3%	6%	0%
Don't like CFLs because of mercury	2%	1%	1%	1%	1%	2%	5%	3%	3%	4%
Convenience/availability/easy to use	3%	2%	5%	3%	3%	3%	0%	2%	0%	0%
Most similar to incandescent I used/use	1%	1%	8%	1%	13%	6%	9%	3%	0%	0%
Exchanging incandescents to other bulbs as needed	2%	1%	1%	3%	0%	0%	2%	0%	0%	0%
Lasts longer	1%	<1%	12%	5%*	3%	2%	9%	25%*	9%	0%
Good quality bulb/trustworthy	1%	<1%	1%	2%	1%	2%	0%	5%	3%	4%
Not as hot	1%	5%	3%	4%	1%	3%	5%	3%	0%	0%
Because of EISA/following the market	1%	5%	2%	1%	0%	0%	2%	0%	0%	0%
Don't like the government telling me what bulb to use	1%	0%	0%	0%	0%	2%	2%	0%	0%	0%
Environmentally friendlier	<1%	<1%	2%	1%	0%	0%	2%	3%	0%	0%
Other	8%	5%	3%	4%	3%	3%	3%	2%	5%	0%
Don't know/refused	7%	3%	4%	4%	8%	14%	4%	2%	9%	0%

* Significantly different from 2011 at the 90% confidence level.

6.2 Stockpiling of Incandescents

The EISA legislation has raised concerns about "stockpiling" or "hoarding" incandescent bulbs, and earlier reports delivered by NMR have documented some of the evidence internationally and in the United States.[14] More recently, information reported by the National Electrical Manufacturers Association (NEMA) suggests that, in 2011, "Shipments of CFLs decreased by 6.6% compared to 2010. Conversely, incandescent lamp shipments rose 16.4% during 2011. A preponderance—62.1%—of the increase over last year occurred during [the fourth quarter]."[15] Given the EISA's new efficiency standards for lighting products, including the phase-out of 100 Watt incandescent bulbs, an important aspect of the present analysis was assessing respondents' likelihood of stockpiling these bulbs.

Across the full sample, the majority of 2012 respondents indicated that they would be very unlikely to buy and save extra 100 Watt incandescent bulbs (66%), while a smaller percentage indicated being very likely to do so (12%), somewhat likely to do so (12%), and somewhat unlikely to do so (9%) (Table 6-3). The average value on the four-point likelihood scale was 3.2. This represents a significant difference from the 59% of 2011 respondents indicating they were very unlikely to stockpile. Comparing those who had been aware of EISA before the survey to those who first found out about EISA during the survey reveals statistically significant differences in the likelihood to stockpile. Specifically, those already familiar with the legislation are more likely to say they will stockpile bulbs (17%) than those who only found out about EISA during the survey (9%). Additionally, those unfamiliar with EISA indicated they are very unlikely to stockpile, a significant difference from those aware of the EISA legislation (70% versus 61%, respectively) and even from those unaware in 2011 (70% versus 63%, respectively). As suggested in 2011, these findings suggest that the PAs may want to develop materials targeted at those who are just learning about EISA—perhaps even explaining the legislation to customers—but promoting the most efficient lighting options as viable, even superior, options to incandescents.

[14] NMR. *Results of the Massachusetts and South Dakota* 2011.
[15] See http://www.nema.org/News/Pages/Shipments-of-Incandescent-Lamps-Illuminate-at-the-Close-of-2011.aspx.

Table 6-3: Likelihood of Buying and Saving Extra 100 Watt Incandescent Bulbs for Use After 2012

(Base: All Respondents)

Level of likelihood	Overall		Aware of EISA		Not Aware of EISA	
	2011	*2012*	*2011*	*2012*	*2011*	*2012*
Sample size	*582*	*604*	*327*	*292*	*255*	*312*
Mean	3.3	3.2	3.1	3.1	3.4*Ω	3.3
1. Very likely	11%	12%	17%*	17%*	6%*Ω	9%Ω
2. Somewhat likely	11%	12%	12%	13%	11%	12%
3. Somewhat unlikely	16%	9%	12%	9%	20%	9%**
4. Very unlikely	59%	66%**	60%	61%	63%	70 %Ω**
Don't know/refused	3%	1%	0%	<1%	1%	1%

* Significantly different from Overall at the 90% confidence level.

** Significantly different from 2011 at the 90% confidence level.

Ω Significantly different from 'Aware of EISA' at the 90% confidence level.

We also gauged potential stockpiling of incandescent bulbs by asking the number of 100 Watt incandescents purchased by respondents who had self-reported buying these bulbs in the past three months (see Section 4.1). Among 100 Watt purchasers, the average number of 100 Watt bulbs purchased by the 2012 respondents was 6.04, and the median value (the number occurring at the midpoint of purchases) was four (Table 6-4). The greatest number of respondents (66%) who had purchased 100 Watt incandescent bulbs reported purchasing only one to five of them in the past three months, which coincides with the "four-pack" of incandescent bulbs. However, 31% of respondents buying 100 Watt incandescents reported buying six or more bulbs. Expanding the analysis to all respondents—most of whom did not buy 100 Watt incandescents—places the findings in a broader context, indicating fairly low rates of stockpiling across the broader population. Only 5% of the entire sample purchased 100 Watt incandescents, with a mean purchase 0.23 bulbs per participant. Compared with the 2011 results, 2012 respondents purchased fewer 100 Watt bulbs in smaller quantities, but this may reflect the seasonality of lighting purchases and not movement away from 100 Watt bulbs, as we will explore in the Wave 3 survey.

Table 6-4: Quantity of 100 Watt Incandescent Bulbs Purchased

(Base: Respondents who said they had bought 100 Watt incandescent bulbs in the past three months)

Number of bulbs purchased	100 Watt Incandescent Purchasers		All Respondents	
	2011	2012	2011	2012
Sample size	*47*	*28*	*582*	*604*
Mean	12.50[a]	6.04	1.10	0.23
Median	6	4	0	0
Quantity purchased				
1-5	40%	66%	3%	3%
6-10	23%	18%	2%	1%
11-25	23%	10%	2%	<1%
25+	13%	3%	1%	<1%
Don't know/Refused	0%	3%	0%	<1%

[a] The total number of *weighted* bulbs purchased is 142, but multiplying 6.04 by the *unweighted* sample size of 28 yields a bulb count of 170. Use of the weighted sample size of 23 provides the correct answer, albeit with rounding error.

As expected, those 2012 respondents who had indicated they were likely to stockpile 100 Watt incandescents also self-reported purchasing more (97 bulbs) of those bulbs than the respondents who said they would be unlikely to stockpile (45 bulbs), a similar pattern to last year (Table 6-5). It is worth noting that those likely to stockpile in 2011 purchased significantly more 100 watt bulbs (549 bulbs) than those likely to stockpile in 2012 (97 bulbs), but again, this may simply indicate the seasonality of lighting purchases.

Table 6-5: Total Number of 100 Watt Incandescent Bulbs Purchased by Self-Reported Tendency to Stock Pile

(Base: Respondents who said they had bought 100 Watt incandescent bulbs in the past three months)

Stockpiling likelihood	Likely to stockpile		Unlikely to stockpile	
	2011	2012	2011	2012
Sample size	*31*	*17*	*16*	*10*
Total 100 Watt Incandescent bulbs purchased	549	97	82	45

7 CFL Price Awareness and Satisfaction

The non-incentivized price of CFLs has risen in the past year due to the scarcity of rare earth minerals, some of which are key components of CFLs.[16] The survey asked respondents who are somewhat or very familiar with CFLs if they had noticed a price increase and, if so, whether the increase had prevented them from buying CFLs. The team also asked respondents who have used CFLs how satisfied they are with them. All respondents that have used CFLs were also asked to name things they like about CFLs and things they do not like about them. Users of dimmable CFLs were asked to provide an assessment of those types of bulbs as well. New to the 2012 effort, respondents also indicated if their satisfaction with CFLs had increased or decreased over the past year, the reasons for their potential change in satisfaction, and whether news stories about CFLs had influenced their satisfaction with the bulbs.

7.1 CFL Price Awareness

The majority of 2012 respondents who were somewhat or very familiar with CFLs (45%) had not noticed whether the price of CFLs had changed from last year to this year (Table 7-1). Another 22% believed the price of CFLs was about the same across the time period. Of those remaining, an equal number of respondents thought prices were lower and higher (13% each) this year compared to last. Interestingly, recent purchasers were more likely than others to say that the price of CFLs has stayed about the same than in the previous year (30%). As expected the majority of respondents who did not recently purchase CFLs have not noticed a price change from last year. Thus, recent price increases in CFLs have been largely unnoticed by the respondents in the survey, perhaps because many of them obtained program-supported CFLs and were not directly exposed to the price increase brought on by the scarcity of rare earth minerals or because they had not purchased CFLs recently enough to notice the prices. Alternatively, consumers may be less sensitive to CFL prices than previously thought, but more direct market-based research that carefully tracks sales with changes in incentive levels would be needed to draw this conclusion with more confidence.

[16] DiClerico, Daniel. 2011. "Shortage of rare earth metals results in higher CFL prices." *Consumer Reports*. September 16, 2011. Available at http://news.consumerreports.org/appliances/2011/09/shortage-of-rare-earth-metals-stokes-controversy-around-cfls.html.

Table 7-1: CFL Price Compared to Previous Year

(Base: Respondents who were somewhat or very familiar with CFLs)

CFL price compared to previous year	Overall		Recently Purchased CFLs		Did not Recently Purchase CFLs	
	2011	2012	2011	2012	2011	2012
Sample size	*432*	*433*	*139*	*102*	*88*	*94*
No, haven't noticed	40%	45%	26%*	28%*	28%	57%Ω
About the same	21%	22%	20%	30%**	27%	17%Ω
Lower	13%	13%	23%*	18%	14%Ω	8%Ω
Higher	16%	13%	27%	13%**	14%	11%
Don't know/Refused	10%	8%	5%*	11%**	17%Ω	8%

* Significantly different from Overall at the 90% confidence level.

** Significantly different from 2011 at the 90% confidence level.

Ω Significantly different from 'Recently Purchased CFLs' at the 90% confidence level.

After giving their estimation of CFL price compared to the previous year, the 48 respondents in 2012 who indicated CFL prices had increased revealed whether the higher price prevented them from purchasing CFLs. The majority of respondents who had noticed an increase (55%) were not influenced by the higher price to avoid purchasing CFLs (Table 7-2). However, two out of five respondents (40%) did indicate that the higher price was enough to make them avoid CFLs.

Table 7-2: Whether Higher Price Prevented Recent CFL Purchases

(Base: Respondents who said they thought CFL price was higher than previous year)

Response	2011	2012
Sample size	*53*	*48*
Yes	42%	40%
No	54%	55%
Don't know/Refused	4%	5%

7.2 CFL Satisfaction

The survey included a question about CFL satisfaction that has been asked since the 2009 consumer survey. In the 2011 report, NMR noted a decrease in the percentage of households very satisfied and satisfied with CFLs. The 2012 results complicate our understanding of CFL satisfaction. Importantly, the majority of respondents in 2012 (76%) indicated that they were somewhat to very satisfied with CFLs (Table 7-3), a 3% increase over the 2011 survey but still lower than combined satisfaction in 2009 and 2010. Yet, in the current sample, a greater percentage of respondents indicated they were very satisfied with standard CFLs compared to the 2011 sample (45% and 35%, respectively). The 2012 results compared with 2009 and 2010 were in fact more similar. NMR will continue to monitor this trend in the third wave of the survey.

Table 7-3: Satisfaction with Standard CFLs

(Base: Respondents who said they had ever used a CFL on the interior or exterior of home)

Level of satisfaction	2009	2010	2011	2012
Sample size	*339*	*313*	*390*	*414*
Very satisfied	55%	50%ǂ	35%ǂʊ	45%ʊ ǂ∞
Somewhat satisfied	31%	36%	38%	31%
Neither satisfied nor dissatisfied	7%	3%	9%	13%
Somewhat dissatisfied	3%	7%	12%	7%
Very dissatisfied	2%	3%	5%	4%
Don't know/Refused	2%	1%	1%	<1%

ǂ "Very satisfied" significantly different from 2009 at the 90% confidence level.
ʊ "Very satisfied" significantly different from 2010 at the 90% confidence level.
∞ "Very satisfied" significantly different from 2011 at the 90% confidence level.

Due to the concerns raised in response to the decreased levels of satisfaction found in the 2011 survey, the Team added questions in 2012 to determine if respondents' satisfaction with CFLs had changed over time, and, if so, why their opinions had changed.

Respondents who indicated they use CFLs were prompted to report if their satisfaction with CFLs has changed over the past year. More than three out of four (76%) said satisfaction with CFLs has stayed the same, and 18% said their satisfaction had increased (Table 7-5). Only 5% replied that they are less satisfied with CFLs now than a year ago.

Table 7-4: Change in Satisfaction with CFLs Over Past Year

(Base: Respondents who had ever used CFLs)

Has level of satisfaction with CFLs increased, decreased, or stayed the same?	2012
Sample size	*414*
Increased	18%
Decreased	5%
Stayed the same	76%
Don't know/Refused	1%

When looking at the relationship between lighting news and CFL satisfaction, it appears that news stories have had an influence on levels of CFL satisfaction. Of the 31 respondents who indicated their satisfaction with CFLs increased over the past year and who had been exposed to news stories about lighting, 67% said that news stories about CFLs were responsible for that increase. Alternatively, of the 13 respondents whose satisfaction with CFLs decreased, 59% indicated that news stories were responsible for the decrease. Taken together then, these findings indicate that media attention toward CFLs has the capability to sway opinions toward the bulbs in either direction, depending on the content of the story, but, on the whole, the influence appears to have been more positive than negative in the past year.

Table 7-5: Whether News Stories about Light Bulbs Increased or Decreased Satisfaction with CFLs

(Base: Respondents who had read news stories about light bulbs and whose satisfaction with CFLs had changed over past year)

Did news stories increase or decrease satisfaction with CFLs?	Satisfaction Increased	Satisfaction Decreased
Sample size	*31*	*13*
Yes	67%	59%
No	30%	41%
Don't know/Refused	3%	0%

When asked for reasons for increased CFL satisfaction, satisfied respondents provided a mixed list of attributes. The brightness of CFLs was the most often provided reason (20%) while a variety of shapes and sizes (18%), the improvement in performance (17%), energy saving features (16%), and longer bulb life (16%) rounded out the top five most mentioned reasons. Interestingly the positive environmental attributes associated with CFLs were only mentioned 2% of the time.

Table 7-6: Reasons for Increased Satisfaction with CFLs Over Past Year

(Base: Respondents whose satisfaction had increased)

Reasons (Multiple Response)	**2012**
Sample size	*82*
Brightness	20%
Variety of shapes and sizes/not just spiral	18%
Performance has improved	17%
Energy saving/energy efficiency	16%
Long bulb life	16%
Light color/quality is better	10%
Warm up faster	9%
Money saved on energy bill	7%
Price/cost of bulb	6%
Bulb doesn't get hot	5%
Becoming more familiar with them	4%
Availability/easier to find	2%
Dimmability	2%
Better for environment	2%
Don't know/Refused	5%

Respondents who cited a decrease in satisfaction with CFLs over the past year were also asked to provide specific reasons. Almost one-half of the responses (48%) focused on perceived poor light output, brightness, or color (Table 7-7). Dissatisfaction with bulb life (19%), mercury disposal issues (14%), and the appearance of the bulb (10%) rounded out the top five most often mentioned reasons for dissatisfaction. That respondents considered CFLs to be too expensive was only mentioned 5% of the time.

Table 7-7: Reasons for Decreased Satisfaction with CFLs Over Past Year

(Base: Respondents whose satisfaction had decreased)

Reasons	2012
Sample size	*21*
Poor light output/brightness/color	48%
Shorter bulb life than promised	19%
Mercury/disposal issues	14%
Don't like the look of the bulb	10%
LEDs/other efficient bulbs are better	10%
Don't like the government forcing us to use them	5%
Too expensive	5%
Take too long to warm up	5%
Don't know/Refused	5%

In 2011, the Team began to ask both satisfied and dissatisfied CFLs users what they liked and did not like about CFLs, thus providing a more complete picture of the range of opinions about CFLs. Table 7-8 summarizes the responses, reporting results overall, but also by levels of satisfaction. The most common reason for liking CFLs is that they save energy—named by 51% of satisfied 2012 respondents and 31% of dissatisfied 2012 respondents. Moreover, with the exception of the 19% of dissatisfied respondents who do not like anything about CFLs, both groups also tended to like the longer life of CFLs and that they save money. Respondents who were satisfied with CFLs in 2011 also appreciated their quality and brightness. Although the satisfied 2012 sample cited these reasons as well, they were not as frequently mentioned as last year.

Table 7-8: Reasons Respondents Like CFL Bulbs

(Base: Respondents who said they had ever used a CFL on the interior or exterior of home)

Reasons (Multiple Response)	Satisfied with CFLs[a]		Dissatisfied with CFLs[b]		Total	
	2011	2012	2011	2012	2011	2012
Sample size	*280*	*310*	*107*	*103*	*390*	*414*
Save energy	49%	51%	36%	31%	45%	47%
Longer bulb life	36%	40%	16%	20%	30%	36%*
Save money on bills	21%	20%	10%	20%*	18%	20%
Do not like anything about them/negative impression	3%	3%	26%	19%	9%	7%
Good quality	12%	7%*	2%	3%	9%	6%
Brighter/brightness	14%	6%*	2%	1%	10%	5%*
Don't get hot	12%	6%*	1%	1%	8%	5%*
Help environment	4%	6%	4%	6%	4%	6%
Convenience/easy to install	3%	3%	3%	6%	3%	4%
Type of light i.e. soft, clear	4%	8%*	1%	2%	3%	6%*
Cheaper	2%	4%	1%	3%	1%	4%*
Color/color choices	2%	1%	1%	1%	2%	1%
Durability	2%	1%	0%	1%	1%	1%
They are versatile/many uses	1%	1%	1%	1%	1%	1%
Resemble incandescents in shape	<1%	1%	2%	0%	1%	1%
Other	2%	2%	1%	1%	2%	2%
Don't know/nothing in particular/no preference/refused	3%	4%	13%	9%	6%	5%

* Significantly different from 2011 at the 90% confidence level.

[a] Indicated that they were "very satisfied" or "somewhat satisfied" with CFLs.

[b] Indicated that they were "neither satisfied or dissatisfied," "somewhat dissatisfied," or "very dissatisfied" with CFLs.

Table 7-9 on the next page lists the things about CFLs that both satisfied and dissatisfied respondents do not like. While it is not surprising that 54% of satisfied 2012 respondents answered that there was nothing they disliked about CFLs, 38% of dissatisfied respondents mentioned the same thing, mainly because "neutral" responses were included in this group. A

much greater percentage of the 2012 respondents in both groups found nothing they disliked about CFLs compared with the 2011 respondents. The most commonly disliked characteristic of CFLs is their slowness to brighten, mentioned by 14% of satisfied respondents and 27% of dissatisfied respondents. Both groups also mentioned mercury and disposal issues (7% of satisfied and 14% of dissatisfied) and poor light color (5% of satisfied and 16% of dissatisfied). Although mentioned by more dissatisfied respondents than satisfied ones, other common concerns included the brightness and light output of the bulbs, their appearance, shorter than promised life, expense, and that they do not work in certain fixtures.

Table 7-9: Reasons Respondents Do Not Like CFLs

(Base: Respondents who said they had ever used a CFL on the interior or exterior of home)

Reasons (Multiple Response)	Satisfied with CFLs[a]		Dissatisfied with CFLs[b]		Total	
	2011	2012	2011	2012	2011	2012
Sample size	*280*	*310*	*107*	*103*	*390*	*414*
Nothing I don't like about them	42%	54%*	19%	38%*	36%	50%*
Slow to turn on/brighten	20%	14%*	34%	27%	23%	17%*
Mercury/disposal issues	9%	7%	24%	14%*	13%	9%*
Poor light color	8%	5%	13%	16%	10%	8%
Not bright enough	6%	5%	20%	14%	9%	7%
Poor light output	3%	1%*	15%	10%	6%	3%*
Don't like the look of bulb	6%	4%	7%	4%	6%	4%
Shorter bulb life than promised	4%	2%	8%	6%	5%	3%
Price/expense	7%	9%	7%	5%	7%	8%
Not suitable/don't fit certain fixtures	3%	7%*	3%	3%	3%	6%*
Flicker	1%	<1%	1%	1%	1%	<1%
Too bright	2%	1%	0%	1%	2%	1%
Buzz	1%	<1%	1%	0%	1%	<1%
Poor manufacturing	1%	2%	2%	0%	1%	2%
Don't work with dimmer switch	0%	1%	4%	1%	1%	1%
Don't like government forcing consumers to buy them	0%	<1%	1%	2%	1%	1%
Poor durability/break easily	6%	2%*	1%	1%	4%	2%
Not adaptable enough	1%	0%	1%	0%	1%	0%
Do not work in the cold	1%	1%	1%	0%	1%	1%
Other	2%	3%	6%	3%	3%	3%
Don't know/Refused	6%	1%	1%	3%	5%	1%

* Significantly different from 2011 at the 90% confidence level.

[a] Indicated that they were "very satisfied" or "somewhat satisfied" with CFLs.

[b] Indicated that they were "neither satisfied or dissatisfied," "somewhat dissatisfied," or "very dissatisfied" with CFLs.

Respondents who have used dimmable CFLs were also asked what they did not like about these products. As with standard CFLs, the most frequent response was that there is nothing the 2012 respondents did not like about dimmable CFLs (61%) (Table 7-10). However, though not mentioned as frequently, concerns dimmable users cited included being slow to turn on/brighten (6%), and not dimming to low light levels or dimming as low as incandescents (5%).

Table 7-10: Dimmable CFL Features Respondents Do Not Like

(Base: Respondents who said they had ever used a CFL on the interior or exterior of home and were somewhat or very familiar with dimmable CFLs)

Reasons (Multiple Response)	**2011**	**2012**
Sample size	*193*	*201*
Nothing I don't like about them	55%	61%
Slow to turn on/brighten	9%	6%
Do not dim to low light levels/Do not dim as low as incandescents	6%	5%
I don't currently use them	6%	9%
Need to replace switch/need compatible switch	3%	2%
They don't work well (unspecified)	2%	1%
Price/too expensive	4%	4%
Poor light color	2%	4%
Flicker	2%	2%
They are hard to find	3%	2%
Not bright enough	1%	2%
Shorter bulb life than promised	2%	4%
Mercury/disposal issues	1%	2%
Buzz	1%	2%
Poor manufacturing	2%	1%
Dislike everything about them	2%	1%
Don't fit in my fixtures	1%	1%
They aren't as efficient	1%	0%
When dimmed with other CFLs, light level or brightness is not the same for all bulbs	<1%	1%
Other	0%	2%
Don't know/Refused	7%	6%

8 Customer Demographics

The Team collected a standard battery of demographic and housing characteristics that help to assess the nature of the sample. Due to the use of different sampling strategies across the four years[17], the team we present the *unweighted* demographic data across the four years. The results suggest very similar demographic characteristics of respondents across the surveys.

8.1 Housing Characteristics

The majority of respondents in all four years resided in single-family detached homes or single-family attached homes (Table 8-1). The percentage of single-family homes is higher than in the Massachusetts Census in all four years.

Table 8-1: Type of Home

(Base: All Respondents)

Type of home	Massachusetts Census	2009	2010	2011	2012
Sample size	*2,520,419*	*503*	*381*	*582*	*604*
Single-family detached house	52%	68%	65%	64%	64%
Single-family attached house (townhouse, row house, or duplex)	5%	15%**	13%	14%	12%
Apartment building with 2-4 units	21%	6%	9%	10%	11%
Apartment building with 5 or more units	21%	8%	11%	10%	12%
Mobile home or house trailer	1%	1%	1%	<1%	<1%
Other	0%	1%	1%	1%	2%
Don't know/Refused	-	1%	-	<1%	<1%

* Total occupied housing units

** Duplexes counted with single-family attached in 2009, but with all two-to-four unit buildings in 2010, which is more in keeping with Census reporting.

[17] The 2009 survey relied on a random digit dial survey of all landlines, while the 2010 survey also relied on a random digit dial approach but of both landlines and cell phone lines. The 2011 and 2012 studies drew respondents from the PAs' customer lists.

Respondents living in houses also revealed the decade in which their home was built. As in previous years, the largest percentage of homes in 2012 was built before 1930, but the homes in the survey samples still tend to be somewhat holder than those in the state overall (Table 8-2).

Table 8-2: Decade in Which Home was Built

(Base: Those living in single-family houses)

Decade	Massachusetts Census	2009	2010	2011	2012
Sample size	*2,520,419*	*409*	*296*	*458*	*456*
1930s or earlier	35%	26%	31%	25%	24%
1940s	6%	7%	4%	5%	4%
1950s	12%	13%	14%	13%	15%
1960s	11%	9%	10%	13%	14%
1970s	12%	11%	10%	11%	11%
1980s	11%	13%	13%	11%	13%
1990s	8%	12%	7%	9%	7%
2000 or later	7%	6%	9%	9%	9%
Don't know/Refused	-	3%	3%	2%	2%

* Total occupied housing units

Just over three out of four respondents indicated being the owners of their homes in 2012, while the remaining 23% rented or leased (Table 8-3). These results are not that different from 2009, when we surveyed an even greater proportion of owners (82%), or from 2010 when the inclusion of a cell-phone sample contributed to a slightly larger sample of renters (24%).

Table 8-3: Ownership of Home

(Base: All Respondents)

Tenure	2009	2010	2011	2012
Sample size	*503*	*381*	*582*	*604*
Own/Buying	82%	75%	78%	77%
Rent/Lease	17%	24%	21%	23
Occupied without payment or rent	0%	<1%	0%	<1%
Other	0%	0%	<1%	0%
Don't know/Refused	1%	<1%	<1%	<1%

*Total occupied housing units

The majority of homes surveyed in 2012 were less than 3,500 square feet (96%) in size (Table 8-4). The greatest single percentage of homes in 2012 fell in the size range of 1,400 to 1,999 square feet.

Table 8-4: Size of Home

(Base: All Respondents)

Square Feet	2009	2010	2011	2012
Sample size	*350*	*273*	*441*	*517*
Less than 1,400	24%	34%	32%	32%
1,400 – 1,999	28%	25%	29%	36%
2,000 –2,499	19%	19%	17%	15%
2,500 – 3,499	16%	14%	15%	13%
3,500 – 3,999	3%	5%	4%	2%
4,000 – 4,999	3%	2%	2%	1%
5,000 or more	6%	2%	2%	2%
Don't know/Refused (sample size)	153	108	141	87

The numbers of rooms in respondents' homes are shown in Table 8-5. The most common number of rooms per home in 2012 was evenly split between five and six (17% each), with a slightly higher percentage of homes with five rooms instead of six, as in the other samples.

Table 8-5: Rooms in Home

(Base: All Respondents)

Total Rooms	Massachusetts Census	2009	2010	2011	2012
Sample size	*2,520,419**	*503*	*381*	*582*	*604*
1	2%	<1%	3%	1%	1%
2	3%	1%	2%	2%	1%
3	10%	4%	8%	7%	9%
4	15%	7%	9%	11%	11%
5	18%	14%	14%	14%	17%
6	18%	24%	20%	19%	17%
7	13%	17%	15%	14%	14%
8	10%	11%	12%	11%	14%
9	12%**	8%	9%	8%	6%
10 or more		12%	7%	12%	9%
Don't know/Refused	-	2%	<1%	1%	1%

*Total occupied housing units

** The ACS reports only 9 or more rooms.

8.2 Social Attributes

Respondents in 2012 tended to hold a Bachelor's degree or higher (57%), which is equivalent to the 2009 and 2010 samples, but lower than the 2011 sample (Table 8-6).

Table 8-6: Highest Level of Education

(Base: All Respondents)

Degree Attained	2009	2010	2011	2012
Sample size	*503*	*582*	*582*	*604*
Less than high school graduate	3%	3%	2%	2%
High school graduate (Includes GED)	16%	15%	15%	17%
Some college or associates degree	20%	25%	21%	23%
Bachelors degree or higher	57%	56%	61%	57%
Don't know/refused	3%	1%	2%	1%

*Population 25 years and over

The 2012 respondents were more likely to live alone than were respondents in 2011 (Table 8-7). The most common household size among respondents across the three years was two. This question was asked differently in 2009, so no comparable data are available for that year.

Table 8-7: Number of Persons Living the Home

(Base: All Respondents)

Number of household members	Massachusetts Census	2010	2011	2012
Sample size	*2,520,419**	*381*	*582*	*604*
1	29%	21%	17%	21%
2	32%	37%	37%	39%
3	16%	15%	19%	16%
4	22%**	16%	15%	17%
5		7%	7%	5%
6 or more		3%	5%	1%
Don't know/refused	-	1%	<1%	2%

* Total occupied housing units

** The ACS reports only 4-or-more person household

Respondents' household incomes are reported in Table 8-8. Although there was variation in income across the sample, 28% of respondents in 2012 reported earning over $100,000 a year, which is 3% lower than the 2011 sample. Despite the use of a cell phone sample in 2010 to capture hard-to-reach customers, a greater percentage of households in 2009 reported making less than $15,000 a year than in 2010, 2011, or 2012. However, it should be noted that many respondents refuse to provide their income, biasing these results to an unknown extent.

Table 8-8: Household Income

(Base: All Respondents)

Household Income	Massachusetts Census	2009	2010	2011	2012
Sample size	*2,520,419**	*370*	*314*	*485*	*491*
Less than $15,000	13%	15%	9%	6%	6%
$15,000 to less than $20,000	5%	5%	7%	5%	4%
$20,000 to less than $30,000	8%	8%	8%	10%	11%
$30,000 to less than $40,000	8%	8%	10%	9%	8%
$40,000 to less than $50,000	8%	8%	5%	8%	10%
$50,000 to less than $75,000	17%	14%	16%	16%	19%
$75,000 to less than $100,000	13%	21%	17%	14%	15%
$100,000 to less than $150,000	16%	14%	19%	18%	16%
$150,000 or more	13%	14%	9%	13%	12%
Don't know (sample size)	-	*11*	*18*	*14*	*10*
Refused (sample size)		*122*	*49*	*81*	*103*

*All households

The sample was fairly evenly split between genders, although, similar to 2009 and 2010, more than one-half of the 2012 respondents were female (53%) (Table 8-9).

Table 8-9: Gender

(Base: All Respondents)

Gender	Massachusetts Census	2009	2010	2011	2012
Sample size	*6,547,629**	*503*	*381*	*582*	*604*
Female	52%	60%	55%	49%	53%
Male	48%	40%	45%	51%	47%

* The census no longer lists the gender of the householder for married-couple families, so this is based on the total population of the state.

8.3 Environmental and Early Adopter Opinions

Also included in the survey were items addressing respondents' agreement with prevalent environmental and technological issues. First, respondents answered whether protection of the environment or economic growth should be given priority. The majority of 2012 respondents felt that protection of the environment should be prioritized (69%), up 2% from the 2011 responses. Alternatively, 23% of respondents felt that economic growth was the more pressing issue (Table 8-10).

Table 8-10: Respondents' Agreement with Two Statements about Environment and Economy

(Base: All Respondents)

Agree most with which statement	2011	2012
Sample size	*582*	*604*
Protection of the environment should be given priority	67%	69%
Economic growth should be given priority	19%	23%
Don't know/Refused	14%	8%

Respondents also reported their levels of agreement with three statements about technology. When given the statement "I am skeptical of new technology. I like to wait until a new technology is proven before I buy it," the majority of 2012 respondents voiced agreement or strong agreement (69%). Alternatively, most respondents (67%) disagreed or strongly disagreed with the statement "I always like to have the latest gadget." The highest levels of agreement of all three statements, though, were evinced for the final sentiment, that "I am comfortable learning about how new technologies work," in which 90% of respondents either agreed or strongly agreed (Table 8-11).

Table 8-11: Respondents' Agreement with Statements about Technology

(Base: All Respondents)

Level of Agreement	I am skeptical of new technology. I like to wait until a new technology is proven before I buy it		I always like to have the latest gadget		I am comfortable learning about how new technologies work	
	2011	2012	2011	2012	2011	2012
Sample size	*582*	*604*	*582*	*604*	*582*	*604*
Strongly agree	18%	22%	9%	7%	36%	35%
Agree	51%	47%	24%	25%	55%	55%
Disagree	22%	22%	49%	49%	7%	7%
Strongly Disagree	8%	7%	17%	18%	2%	2%
Don't know/Refused	1%	2%	1%	2%	1%	2%

9 Conclusions and Recommendations

Earlier in 2012, the Team delivered the 2011 (first wave) consumer lighting report; this report described EISA baseline conditions, as the survey coincided with the initial implementation of the new lighting standards. Currently the PAs and EEAC Consultants are reviewing a revised draft of the spring 2012 lighting saturation study, which also provided information on residential lighting use during the early stages of EISA implementation. This report serves as an interim check-in on the residential lighting market one-half year after the earliest phases of EISA implementation. Therefore, the team refrains from drawing new conclusions or making recommendations. Instead, we review the recommendations from the 2011 consumer survey and the 2012 onsite saturation study in light of the findings from this current report.

Satisfaction with CFLs: The 2011 survey provided evidence that customer satisfaction with CFLs was declining, while the onsite study demonstrated that, in fact, those dissatisfied with CFLs used fewer of them—even though they still typically used at least some CFLs. The current study, in contrast, found that CFL satisfaction was higher in 2012 than in 2011 but remained below 2009 and 2010 levels. While most survey respondents indicated that their satisfaction with CFLs had not changed, 18% reported increased satisfaction with CFLs, while 5% said their satisfaction had decreased. Importantly, news stories about lighting influenced these changing opinions—both the positive and the negative ones. The Team will continue to explore CFL satisfaction in the third wave of the consumer survey and in the upcoming 2013 saturation study, and we continue to recommend that the PAs work with the residential retail products and other residential evaluation teams as well as program implementers to understand the dynamics of consumer satisfaction with CFLs and LEDs more fully.

The Team also previously recommended that the PAs continue to work with program partners to support the highest quality CFLs and LEDs on the market and that the PAs develop educational materials that highlight the features of LEDs that consistently perform better than CFLs (e.g., quickness to brighten, lack of mercury, lifespan) but in a manner that does not denigrate CFLs. We believe the current study results continue to suggest the relevance of both of these recommendations.

A-line CFLs: Respondents to both the 2011 and 2012 study reported relatively low levels of familiarity with A-line CFLs, and use of these bulbs is still uncommon in the homes visited for the saturation study. However, because A-line bulbs closely resemble incandescents and can fit into some types of fixtures that standard CFLs cannot (*e.g.*, those in which the shade clips onto the bulb), NMR recommended in both the 2011 study and the onsite saturation study that the PAs focus more educational and promotional efforts on A-line CFLs. The team also suggesting that the PAs consider thinking of them more as a "standard" CFL rather than a specialty one, as most A-line CFLs will be used in general service and not specialty applications. We believe the 2012 study results support these recommendations.

Bulb Dimmability: In the 2011 survey results, NMR noted that users of dimmable CFLs generally tended to like them, but the most persistent complaint about them is that they do not dim consistently or as much as other types of light bulbs. At that time, we recommended that the PAs consider removing dimmable CFLs in favor of promoting LEDs for dimmable applications. However, since making the recommendation, the Team has learned from various sources that LEDs may have dimmability concerns as well. Therefore, we withdraw the recommendation and refrain from making new recommendations about dimmable bulbs specifically. However, the previous recommendation about continuing to promote only the highest quality energy-efficiency bulbs certainly applies to dimmable energy-efficient bulbs.

Stockpiling of Incandescent Bulbs: The results presented for both the 2011 and 2012 surveys as well as the onsite saturation effort suggested that about one-fourth of respondents will consider stockpiling incandescent bulbs, and that some respondents have already started to do so. Therefore, NMR continues to recommend that the PAs may want to consider placing a consumer education campaign that helps consumers make more informed bulb choices, rather than simply defaulting to the incandescent bulb with which they are most familiar. Moreover, as explained in the onsite study, the PAs may also want to consider asking partner retailers not to repeat "get them while you can" incandescent bulb campaigns in late 2012 and 2013, as they did in late 2012 before the 100 Watt phase-out started.

Consumer Understanding of Key Lighting Concepts: While consumers are becoming more familiar with the term "lumens" and understand that it means light output or brightness, they still buy bulbs based on wattage or wattage equivalence. Therefore, we believe that the suggestion that the PAs continue their efforts at helping consumers make the transition from thinking about Watts to thinking about lumens remains relevant.

A-line Halogen Bulbs: Although telephone survey respondents reported relatively high rates of familiarity with A-line halogen bulbs, the Team found very few of these bulbs in use in onsite households. Yet, as we noted in the onsite study, A-line halogen bulbs look almost exactly like incandescent bulbs and it is likely that consumer are unable to distinguish between the two bulb types in the store. The fact that halogen bulbs are labeled "energy efficient" only adds to consumer confusion; in fact, the number of consumers familiar with *CFLs* who identified halogen and CFLs as using the same amount of energy rose significantly between the 2011 and 2012 studies. Therefore, we believe that our suggestion that the PAs work with other organizations across the nation to try to convince manufacturers to remove the term "energy efficient" from halogen packaging remains relevant in light of the current survey results.

Appendix A Consumer Survey Questionnaire

The 2012 questionnaire follows. Questions highlighted in yellow have been added or substantially changed from the 2011 survey.

Hello, my name is _____ and I am calling from Tetra Tech on behalf of (PA). We are conducting a survey about household lighting. I'm not selling anything. I just want to ask you some questions about lighting in your home.

May I please speak with [INSERT NAME ON THE ACCOUNT].

[IF ACCOUNT HOLDER ISN'T AVAILABLE, READ] Is there an adult over the age of 18 available who is responsible for purchasing the light bulbs for your household? [IF NOT AVAILABLE, TRY TO RESCHEDULE AND THEN TERMINATE]

[IF NECESSARY, OFFER THE CONTACT NAME FROM BELOW AS THE PERSON TO CONTACT WITH ANY QUESTIONS ABOUT THE VALIDITY OF THE RESEARCH.]

Philip Moffitt	Cape Light Compact	508-744-1279
Wendy Todd	National Grid (NGrid/Massachusetts Electric)	781-907-2232
Matt Nelson	NSTAR Electric	781-441-3456
Tony Fornuto	Western Massachusetts Electric Company (WMECO/Northeast Utilities)	413-787-9329
Lisa Glover	Unitil (Fitchburg Gas and Electric)	603-773-6483

AWARENESS OF ENERGY-SAVING LIGHT BULBS

S1. Before this call today, had you ever heard of **Compact fluorescent light bulbs or CFLs**?

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

[ASK S2 IF S1 = 2, 96, 97 OTHERWISE, SKIP TO S3.]

S2. Compact fluorescent light bulbs – also known as CFLs – usually do not look like regular incandescent bulbs. The most common type of compact fluorescent bulb is made with a glass tube bent into a spiral, resembling soft-serve ice cream, and it fits in a regular light bulb socket. Thinking about it again, before today, had you heard of CFLs?

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

[ASK S3 IF S1 =1 OR S2=1, OTHERWISE SKIP TO S4].

S3. How familiar are you with CFLs? Would you say that you are…?

1. Very familiar
2. Somewhat familiar
3. Not too familiar
4. Not at all familiar
96. DON'T KNOW
97. REFUSED

S4. Another type of light bulb that is used in homes is called an L-E-D **[SAY THE LETTERS L-E-D]**, also known as a light emitting diode bulb. These bulbs have regular screw bases that fit into most sockets. They are not battery-operated LEDs, holiday lights, or decorative strands and do not need special attachments to work in regular sockets. How familiar are you with LED light bulbs that screw into regular light sockets? Would you say that you are…?

1. Very familiar
2. Somewhat familiar
3. Not too familiar
4. Not at all familiar
96. DON'T KNOW
97. REFUSED

S5. Another type of light bulb is a halogen bulb. These bulbs have regular screw bases that fit into most sockets; they do not need special attachments to work in regular sockets. How familiar are you with halogen bulbs that screw into regular light sockets? Would you say that you are…?

1. Very familiar
2. Somewhat familiar
3. Not too familiar
4. Not at all familiar
96. DON'T KNOW
97. REFUSED

S6. **[IF S5=1 OR 2 AND S3=1 OR 2; OTHERWISE SKIP TO S7]** As far as you know, which type of bulb uses less energy to produce light—[**RANDOMIZE AND READ**: "compact fluorescent light bulbs" or "halogen bulbs"]—or do both bulbs use about the same amount of energy? **[USE SAME RANDOM ORDER PREVIOUSLY USED IN THE QUESTION; ACCEPT ONE RESPONSE.]**

1. Compact fluorescent lightbulbs use less energy
2. Halogen bulbs use less energy
3. Both bulbs use about the same amount of energy
96. DON'T KNOW
97. REFUSED

S7. **[ASK IF S3 = 1, 2, 3 OTHERWISE SKIP TOEISA1.]** While most CFLs are spiral shaped, CFLs also come in other shapes and some have special features. I'm going to read you a list of different types of CFLs. For each type, please tell me if you are very familiar, somewhat familiar, not too familiar, or not at all familiar with that type of CFL. **[RANDOMIZE ORDER OF A THROUGH F]**

[READ IF NECESSARY WITH EACH ITEM] Are you very familiar, somewhat familiar, not too familiar, or not at all familiar with this type of CFLs?

a. Dimmable CFLs. This refers to a CFL that can be used with a dimmer switch to adjust the level of brightness
b. 3-way CFLs. This refers to a CFL that has the ability to shine at 3 different levels of brightness in a 3-way lamp
c. Flood or recessed lighting CFLs—shaped like a regular incandescent floodlight
d. Candelabra CFLs. This refers to a CFL with a small base for use in a decorative fixture, such as a chandelier.
e. Globe CFLs. This refers to a CFL that has a round shape and might be used in a fixture, such as a vanity light
f. A-shaped CFLs. This refers to a covered CFL that is made to look and feel like a traditional incandescent or regular light bulb.

1. Very familiar
2. Somewhat familiar
3. Not too familiar
4. Not at all familiar
96. DON'T KNOW
97. REFUSED

S8. **[IF S7a=1 or 2; OTHERWISE SKIP TO EISA1]** Do you currently use any dimmable CFLs in your home?

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

EISA Awareness & Future Expectations

EISA1. Have you seen or read any news stories in the past year about light bulbs?

1. Yes	**[CONTINUE]**
2. No	**[SKIP TO EISA3]**
96. DON'T KNOW	**[SKIP TO EISA3]**
97. REFUSED	**[SKIP TO EISA3]**

EISA2. [**IF EISA1=1**] What do you remember seeing or reading in the stories about light bulbs?

1.	**[RECORD VERBATIM]**
96.	(DON'T KNOW)
97.	(REFUSED)

EISA3. A new federal law, the Energy Independence and Security Act of 2007, restricts the sale of 100 Watt incandescents, or regular 100 Watt bulbs, manufactured after January 1, 2012. Had you heard about this new federal law before this call?

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

EISA4. Do you currently use any 100 watt incandescent light bulbs in your home?

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

EISA5. **[IF EISA4 = 2]** Why don't you currently use any 100 watt incandescent light bulbs in your home? **[DO NOT READ RESPONSES; MULTPLE RESPONSE]**

1. (They are too bright)
2. (They use too much energy)
3. (My socket says only to use a certain watt bulb/fixtures won't take such high wattage)
4. (Switching over to energy efficient bulbs)
5. (Switching over to lower wattage bulbs)
6. (Other **[SPECIFY]**)

96. DON'T KNOW
97. REFUSED

EISA6. **[IF EISA4 NE 1]** Do you currently use ANY incandescent light bulbs, of any wattage, in your home?

1. Yes
2. No

96. DON'T KNOW
97. REFUSED

EISA7. **[READ ONLY IF EISA4 NE 2]** We are interested to know the type of bulb you would be likely to use instead of a 100-watt incandescent bulb once this is no longer available for purchase. I'm going to name different types of bulbs that may be options and after I read the list, I'd like you to tell me which one you would be most likely to use instead of the 100-watt incandescent bulb. **[READ ONLY IF EISA4=2]** We understand that you do not currently use any 100 Watt incandescent bulbs, but please tell me which of the following bulb types you would be most likely to use.

The options are **[READ ENTIRE LIST BASED ON INSTRUCTIONS BELOW]. THEN IMMEDIATELY ASK**: Which one of these bulbs would you be **most** likely to use **[READ ONLY IF EISA4 NE 2]** instead of the 100-watt incandescent?
[PROGRAMMER: RANDOMIZE LIST. INCLUDE 2 IN LIST ABOVE AND IN THE ACCEPTABLE RESPONSES ONLY IF S5=1 OR 2; SIMILARLY, INCLUDE 3 ONLY IF S3=1 OR 2 and Answers Yes at S1 or S2, AND INCLUDE 4 ONLY IF S4=1 OR 2]

BULB TYPES
1. A lower wattage incandescent bulb
2. A 72 Watt screw-in halogen bulb meant to replace a 100 watt bulb
3. A 23 Watt screw-in compact fluorescent bulb meant to replace a 100 watt incandescent bulb
4. A 17 Watt screw-in LED **[SAY THE LETTERS L-E-D]** or light-emitting diode bulb meant to replace a 100 watt incandescent bulb
5. A 150 watt incandescent bulb
96. DON'T KNOW **[ONLY ALLOW FOR ENTIRE QUESTION]**
97. REFUSED **[ONLY ALLOW FOR ENTIRE QUESTION]**

EISA8. You said you would be most likely to instead use **[IF EISA7=1 READ:** a lower wattage incandescent bulb]/[**EISA7=2 READ:** a 72 Watt screw-in halogen bulb][**IF EISA7=3 READ:** a 23 Watt screw-in compact fluorescent bulb**]/[IF EISA7=4 READ:** a 17 Watt screw-in LED bulb**]/[IF EISA7=5 READ:** a 150 watt incandescent bulb)]. Why that bulb?

1.	**[RECORD VERBATIM]**
96.	DON'T KNOW
97.	(REFUSED)

EISA9. How likely are you to buy extra 100 Watt incandescent light bulbs and save them for use now that the federal law has gone into effect? Would you say you are . . . **[READ LIST]. [RECORD ONE ANSWER]**:

1. Very likely
2. Somewhat likely
3. Somewhat unlikely, or
4. Very unlikely to buy and save 100 Watt incandescent light bulbs for use?

96. DON'T KNOW
97. REFUSED

[ASK CFL USE AND SATISFATION IF S3 = 1, 2, 3, OTHERWISE SKIP TO AT1 Alternative Lighting Technologies Section.]

CFL USE AND SATISFACTION

USE1. Have you EVER used a compact fluorescent light bulb, or CFL, on the interior or exterior of your home?

1. Yes
2. No

96. DON'T KNOW
97. REFUSED

[IF USE1= 2, 96, 97, SKIP TO INTRO PRECEDING AT1 Alternative Lighting Technologies Section]

USE2. Approximately how long ago did you FIRST use a compact fluorescent light bulb?

[RECORD NUMBER OF YEARS OR MONTHS, NOT A RANGE. IF LESS THAN ONE YEAR, RECORD MONTHS.

IF "DON'T KNOW," PROBE: Is it less than or more than five years ago? WORK FROM THERE TO GET AN ESTIMATE.

ENTER 96 FOR MONTHS AND YEARS IF STILL "DON'T KNOW."

ENTER 97 FOR MONTHS AND YEARS IF REFUSED.]

1. Months _____
2. Years _____
96. DON'T KNOW
97. REFUSED

USE3. Do you CURRENTLY have CFLs installed on the interior or exterior of your home?

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

USE4. **[IF USE1 = 1 AND USE3=2]** Why do you no longer have CFLs installed on the interior or exterior of your home?

1. **[RECORD VERBATIM]**
96. (DON'T KNOW)
97. (REFUSED)

USE5. How satisfied are you with the compact fluorescent light bulbs currently in your home or, if you have no CFLs installed right now, the ones you have used in the past? Would you say you are….?

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied
96. DON'T KNOW
97. REFUSED

USE6. Has your level of satisfaction with CFLs increased, decreased, or stayed the same over the past year?

1. Increased
2. Decreased

3. Stayed the same **[SKIP TO USE10]**
96. (DON'T KNOW) **[SKIP TO USE10]**
97. (REFUSED) **[SKIP TO USE10]**

USE7. [**IF EISA1=1**] Earlier, you mentioned that you had seen or read some news stories about light bulbs. Did these **NEWS STORIES** [IF USE6 = 1 READ "increase"; IF USE6 = 2 READ "decrease"] your satisfaction of CFLs?

1. Yes
2. No
96. (DON'T KNOW)
98. (REFUSED)

USE8. [IF USE6 = 1] What are the reasons for the increase in your level of satisfaction with CFLs?

1. **[RECORD VERBATIM]**
96. (DON'T KNOW)
97. (REFUSED)

USE9. [IF USE6 = 2] What are the reasons for the decrease in your level of satisfaction with CFLs?

1. **[RECORD VERBATIM]**
96. (DON'T KNOW)
97. (REFUSED)

USE10. In your experience, what do you like about compact fluorescent light bulbs? **[DO NOT READ; SELECT ALL THAT APPLY]**:

1. (Save energy)
2. (Save money on bills)
3. (Good quality)
4. (Help environment)
5. (Longer bulb life)
6. (Other **[SPECIFY]**)
7. (Do not like anything about them)
96. (DON'T KNOW)
97. (REFUSED)

USE11. **[IF S7a=1 or 2; OTHERWISE SKIP TO USE12]** Previously you said that you are familiar with dimmable CFLs. Is there anything that you do NOT like about dimmable CFLs? **[DO NOT READ; SELECT ALL THAT APPLY]**

1. (Do not dim to low light levels/Do not dim as low as incandescents)
2. (When dimmed with other CFLs, light LEVEL/BRIGHTNESS is not the same for all bulbs)
3. (When dimmed with other CFLs, light COLOR is not the same for all bulbs)
4. (Poor light color)
5. (Not bright enough)
6. (Too bright)
7. (Slow to turn on/brighten)
8. (Flicker)
9. (Buzz)
10. (Poor manufacturing (unspecified))
11. (Shorter bulb life than promised)
12. (Mercury/disposal issues)
13. (Other **[SPECIFY]**)
14. (Nothing I don't like about them)
96. (DON'T KNOW)
97. (REFUSED)

USE12. Is there anything that you do NOT like about **[IF S7A = 1 or 2 SAY: 'Other types of']** compact fluorescent light bulbs? **[DO NOT READ; SELECT ALL THAT APPLY]**

1. (Poor light color)
2. (Poor light output)
3. (Not bright enough)
4. (Too bright)
5. (Slow to turn on/brighten)
6. (Flicker)
7. (Buzz)
8. (Poor manufacturing (unspecified))
9. (Shorter bulb life than promised)
10. (Mercury/disposal issues)
11. (Other **[SPECIFY]**)
12. (Nothing I don't like about them)
96. (DON'T KNOW)
97. (REFUSED)

ALTERNATIVE LIGHTING TECHNOLOGIES

[**ASK AT1 IF S4= 1, 2, OR 3**; [**IF S4= 4, 96, 97 SKIP TO INTRO PRECEDING BUY1 Recent Lighting Purchases Section**]

I'd like to ask you a few questions about your use of other types of light bulbs.

AT1. Are you currently using L-E-D screw in bulbs in your home—the kind that screw into regular light fixtures?

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

AT2. **[IF AT1=1]** In what types of fixtures or lamp do you have screw-in L-E-D bulbs installed in your home? Again these are only the LEDs that screw into regular light sockets. **[DO NOT READ. ALLOW MULTIPLE RESPONSES]**

1. **[IF R SAYS THEY INSTALLED IT IN A PARTICULAR ROOM, PROBE TO FIND OUT WHAT TYPE OF FIXTURE OR LAMP THE BULB IS IN]**(Ceiling/overhead lighting)
2. (In an appliance)
3. (General lighting/Wherever I can)
4. (Floor/Table/Portable lamps)
5. (Ceiling fans with lighting)
6. (Holiday lighting/Candle)
7. (Outdoor)
8. (Other) **[SPECIFY]**
96. (DON'T KNOW)
97. (REFUSED)

RECENT LIGHTING PURCHASES

Now I have a few questions about how you **usually** buy light bulbs.

BUY1. [IF EISA4=2 OR EISA6=2, READ "Previously you told us that you don't currently use **[IF EISA4 = 2 = "100 Watt"]** incandescent bulbs, but…] Have you looked for 100 Watt incandescent bulbs, or regular 100 Watt bulbs, at any retailers in the past three months, even if you did not buy any?

1. Yes [**CONTINUE**]
2. No [**SKIP TO BUY8**]
96. DON'T KNOW [**SKIP TO BUY8**]
97. REFUSED [**SKIP TO BUY8**]

BUY2. [**IF BUY1 = 1**] In the past three months, when you looked for 100 watt incandescent bulbs, did you find any on the shelves?

[IF NEEDED, PROBE: “”In the past 3 months, have you been to any store to shop for 100 Watt incandescent bulbs, but could not find any on the shelves”?]

1. Yes—went to a store and found them on the shelves **[SKIP TO BUY5]**
2. No—went to a store and could NOT find them on the shelves

96. DON’T KNOW
97. REFUSED

BUY3. **[IF BUY2=2]** After not finding 100 Watt incandescents at that store, did you go look for them at another store, or on the internet?

1. Yes, went to another store
2. Yes, went to look on the internet
3. Yes, both stores and internet
4. No, did not go to another store or look on the internet **[SKIP TO BUY8]**

96. DON’T KNOW **[SKIP TO BUY8]**
97. REFUSED **[SKIP TO BUY8]**

BUY4. **[IF BUY3 = 1, 2, OR 3]** Were you able to find 100 Watt incandescent bulbs at those stores or on the internet in the past three months?

1. Yes, in stores
2. Yes, on internet
3. Yes, both stores and internet
4. No

96. DON’T KNOW
97. REFUSED

BUY5. [**IF BUY4= 1, 2, OR 3 OR BUY2 = 1**] Have you purchased any 100 Watt incandescent bulbs in the past three months?

1. Yes [**CONTINUE**]
2. No [**SKIP TO BUY7**]

96. DON’T KNOW **[SKIP TO BUY7**]
97. REFUSED [**SKIP TO BUY7**]

BUY6. [**IF BUY5 = 1**] How many 100 Watt incandescent bulbs have you purchased in the past three months? **[RECORD ACTUAL RESPONSE; IF DON'T KNOW PROBE FOR BEST GUESS; USE 997 FOR 997 OR MORE, 998 FOR REFUSED, AND 999 FOR DON'T KNOW.]**

BUY7. Now I'd like to ask you about the type of bulbs you might have bought instead of 100 Watt incandescents.

Have you purchased any light bulbs instead of 100 Watt incandescents in the past three months?

1. Yes
2. No **[SKIP TO BUY8]**
96. Don't know **[SKIP TO BUY8]**
97. Refused **[SKIP TO BUY8]**

BUY7 A-E. [**IF BUY4 = 4 or BUY5 = 2**] What type of bulbs did you buy instead of 100 Watt incandescents? **[RANDOMIZE RESPONSES A-D THEN E; MULTIPLE RESPONSE]**.

A. Incandescent bulbs of another wattage [**ASK FOLLOW-UP QUESTION IMMEDIATELY**]
   1A.[**FOLLOW-UP QUESTION**]: What wattage bulbs did you buy instead of the 100 watt incandescent bulbs? **[RECORD]**
B. Compact fluorescent bulbs or CFLs
C. LED bulbs
D. Halogen bulbs
E. Another kind of light bulb **[SPECIFY]**

1. Yes
2. No
96. Don't know
97. Refused

BUY8. [IF ANSWERED "YES" TO ANY IN BUY7A-E , SKIP TO BUY8A]. Now I'd like to ask you about your purchases of other types of light bulbs. Have you purchased any light bulbs in the past three months?

1. Yes
2. No **[SKIP TO BUY9]**
96. Don't know **[SKIP TO BUY9]**
97. Refused **[SKIP TO BUY9]**

BUY8 A-E. Have you purchased any of the following types of light bulbs in the past three months? **[RANDOMIZE AND READ A-G THEN H; MULTIPLE RESPONSE]**

A. [**SKIP IF (**BUY7B **= 1) OR (S2 = 2,96, or 97 or if S3=3 or 4)**] Compact fluorescent lamps or CFLs that screw into regular light sockets

B. [**SKIP IF** (BUY7C **= 1) OR (S4=3 or 4)**] L-E-Ds that screw into regular light sockets

C. [**SKIP IF** (BUY7D **= 1) OR (S5=3 or 4)**] Halogen bulbs that screw into regular light sockets

D. [**SKIP IF (BUY5= 1) OR (** BUY7A**=1)**] Incandescent or regular light bulbs

E. Pin-based fluorescent tubes that can only be used in fluorescent light fixtures

F. [**SKIP IF (S2 = 2,96, or 97) OR (S3=3 or 4)**] Pin-based CFLs that can only be used in special light fixtures

G. [SKIP IF S4=3 or 4] Pin-based L-E-Ds that can only be used in special light fixtures

H. OTHER **[SPECIFY]**

BUY9. What information do you look for on BULB packaging to help you decide which bulb to purchase? **[DO NOT READ. RECORD VERBATIM ANY RESPONSES THAT DO NOT FIT PRECODES. ACCEPT MULTIPLE RESPONSES.]**

1. (Price)
2. (Lighting Facts/Energy Facts Label)
3. (Wattage)
4. (Watt Equivalency)
5. (ENERGY STAR Label)
6. (UL, or Underwriters Laboratories Label)
7. (Lumens)
8. (CRI, or Color Rendition Index)
9. (Bulb Life)
10. (Dimming)
11. (3-way)
12. (Shape)
13. (Mercury Content)
14. (Color Appearance)
15. (Other) **[SPECIFY]**
16. (DON'T KNOW)
17. (REFUSED)

BUY10. I'm going to read a list of types of information you might look for on bulb packaging. You may have already mentioned this, but for each item I read, please tell me whether or not you have looked for it. **[DO NOT SHOW ITEMS 1-13 RECORDED IN BUY9. RANDOMIZE A-N, THEN READ O. RECORD AS YES/NO FOR EACH. ACCEPT MULTIPLE RESPONSES.]**

A. Price?
B. Lighting Facts Label?
C. Wattage?
D. Watt equivalency?
E. The ENERGY STAR label?
F. The UL, or Underwriters Laboratories Label?
G. Lumens?
H. CRI, or color rendition index?
I. Bulb life?
J. Dimming?
K. 3-Way ability?
L. Certain bulb shape?
M. Mercury content?
N. Color appearance?
O. Anything else I didn't already mention?**[SPECIFY]**

1. Yes
2. No
96. DON'T KNOW
97. REFUSED

BUY11. **[SKIP IF S2 = 2, 96, or 97]** Have you noticed the price of CFLs at retailers being higher, lower, or about the same this year compared to last year?

1. Higher
2. Lower
3. About the same
4. No, haven't noticed
96. DON'T KNOW
97. REFUSED

BUY12. **[IF BUY11=1; OTHERWISE SKIP TO P1]** Did the higher price prevent you from purchasing any CFLs that you considered buying recently?

1. Yes
2. No
96 DON'T KNOW
97 REFUSED

Lumens & Key Lighting Knowledge

P1. Before today, have you seen or heard of the word "lumens" used in relation to lighting?

1. Yes
2. No **[SKIP TO P3]**
96 DON'T KNOW **[SKIP TO P3]**
97 REFUSED **[SKIP TO P3]**

P2. What does the word "lumens" mean to you? [**DO NOT READ. FILL IN CLOSEST ANSWER CATEGORY OR RECORD VERBATIM. MULTIPLE ANSWERS ALLOWED. IF RESPONDENT SAYS 'LIGHT QUALITY', PROBE FOR EXACTLY WHAT 'QUALITY' THEY MEAN]**

1. (Light Output or Brightness)
2. (Light Color)
3. (Same as Watts)
95 (OTHER**)[SPECIFY]**
96 DON'T KNOW
97 REFUSED

P3. Have you seen or heard the terms "warm white" and "cool white"- as in the color white - used in relation to lighting?

1. Yes
2. No **[SKIP TO E1]**
96 DON'T KNOW **[SKIP TO E1]**
97 REFUSED **[SKIP TO E1]**

P4. What do the terms "warm white" and "cool white" - as in the color white -mean to you? [**RECORD VERBATIM. MULTIPLE ANSWERS ALLOWED. IF RESPONDENT SAYS 'LIGHT QUALITY', PROBE FOR EXACTLY WHAT 'QUALITY' THEY MEAN]**

1. **[RECORD VERBATIM]**
96. (DON'T KNOW)
97. (REFUSED)

ENVIRONMENTAL, EARLY ADOPTER, REASONS FOR USE

E1. Which one of these two statements about the environment and the economy do you most agree with—**[RANDOMIZE AND READ]**

1. Protection of the environment should be given priority, even at the risk of limiting economic growth OR
2. Economic growth should be given priority, even if the environment suffers to some extent

96. DON'T KNOW
97. REFUSED

E2. Please tell me if you strongly agree, agree, disagree, or strongly disagree with each of the following statements. **[RANDOMIZE AND READ]**

1 Strongly agree
2 Agree
3 Disagree
4 Strongly Disagree
96 DON'T KNOW
97 REFUSED

a. I am skeptical of new technology. I like to wait until a new technology is proven before I buy it.
b. I always like to have the latest gadget.
c. I am comfortable learning about how new technologies work.

CUSTOMER DEMOGRAPHICS

Now I have a few questions for statistical purposes only.

DEM1. What type of home do you live in? Is it a . . .?

1. Single-family detached house
2. Single-family attached house (townhouse, row house, or duplex)
3. Apartment building with 2-4 units
4. Apartment building with 5 or more units
5. Mobile home or house trailer
6. Other (Specify): _____
96. DON'T KNOW
97. REFUSED

[ASK DEM2 IF DEM1 = 1, 2. OTHERWISE, SKIP TO DEM3.]

DEM2. When was your home built? Please stop me when I get to the appropriate category.

1. 1930s or earlier
2. 1940s
3. 1950s
4. 1960s
5. 1970s
6. 1980s
7. 1990s
8. 2000 or later
96. DON'T KNOW
97. REFUSED

DEM3. Do you or members of your household own this home or do you rent?

1. Own/Buying
2. Rent/Lease
3. Occupied without Payment or Rent
4. OTHER (SPECIFY): _____
96. DON'T KNOW
97. REFUSED

DEM4. Approximately how large is your home? [READ LIST IF NECESSARY]

1. Less than 1,400 square feet
2. 1,400 – less than 2000 square feet
3. 2,000 – less than 2500 square feet
4. 2,500 – less than 3500 square feet
5. 3,500 – less than 4000 square feet
6. 4,000 – less than 5000 square feet
7. 5,000 square feet or more

96. DON'T KNOW
97. REFUSED

DEM5. How many rooms are in your home, not counting bathrooms?

[HELP RESPONDENTS COUNT ROOMS IF NEEDED, KEEPING TRACK ON A PIECE OF PAPER OF THE # OF ROOMS AS THEY NAME THEM]

__ RECORD RESPONSE
96. DON'T KNOW
97. REFUSED

DEM6. What is the highest level of education that the head of household has completed so far?

[READ CATEGORIES, IF NECESSARY.]

1. Less than Ninth Grade
2. Ninth to Twelfth Grade, No Diploma
3. High School Graduate (includes GED)
4. Some College, No Degree
5. Associated Degree
6. Bachelors Degree
7. Graduate or Professional Degree

96. DON'T KNOW
97. REFUSED

DEM7. Counting yourself, how many people normally live in this household on a full time basis? Please include everyone who lives in your home whether or not they are related to you and exclude anyone who is just visiting or children who may be away at college or in the military.

RECORD NUMBER OF PEOPLE ____
96. DON'T KNOW
97. REFUSED

DEM8. Which category best describes your total household income in 2011 before taxes? Please stop me when I get to the appropriate category.

1. Less than $15,000
2. $15,000 to less than $20,000
3. $20,000 to less than $30,000
4. $30,000 to less than $40,000
5. $40,000 to less than $50,000
6. $50,000 to less than $75,000
7. $75,000 to less than $100,000
8. $100,000 to less than $150,000
9. $150,000 or more

96. DON'T KNOW
97. REFUSED

DEM9. [INTERVIEWER: DO NOT READ.]

Sex:

1. Female
2. Male

CFL REFERENCE (source: http://www.energystar.gov/index.cfm?c=cfls.pr_cfls_shapes**):**

Bulb Image	Type of Bulb
	Spirals
	A-shaped bulbs: Made to look and feel like traditional incandescents.
	Globe: This refers to a CFL that has a round shape and might be used in a fixture, such as a vanity light.
	Tubed
	Candelabra: Small bulbs for use in decorative fixtures where you can see the light bulb. Often used in chandeliers
	Posts, Capsules, Barrels: Covered post bulbs for outdoor fixtures; there are also yellow "bug light" covered posts, designed to keep away insects.

	Indoor Reflectors: Provide directional light; recessed ceiling lights or ceiling fans.