# Massachusetts Consumer Survey Results Winter 2012

## *FINAL*

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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 (hereafter the Team). The research presented here compares the results of a telephone survey (hereafter the Winter 2012 survey), performed between December 4, 2012, and January 21, 2013, with the results of two similar surveys (hereafter the Winter 2011 and Summer 2012 surveys) performed between December 8, 2011, and January 19, 2012, and June 18, 2012, and August 2, 2012, respectively.[1] The Winter 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 mid- and Winter 2012 surveys 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 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 recent consumer surveys included the following, some of which allowed for the continued monitoring of the market from earlier evaluations:

- 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

[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.

New to the Winter 2012 survey effort were items geared at answering lingering questions from previous surveys, as well as attempts to track consumer behavior related to future EISA phase-outs. These include:

- Recent light bulb purchases of 75-Watt incandescent bulbs as well as 100-Watt incandescents to identify prior and anticipated stockpiling of incandescent bulbs
- Likely bulb choices when 75-Watt incandescents are no longer available
- A new analysis of key differences in knowledge, behavior, and opinions between CFL experts (respondents who self-report using five or more CFLs; 44% of full sample) and CFL novices (those who use fewer than five CFLs or are not aware of CFLs; 56% of full sample)[2]

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

- 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 600 households, with five respondents answering the Spanish version of the survey. The Winter 2012 sampling strategy targeted an approximate 50% split of single- and multifamily homes in order to meet the needs of the forthcoming regional hours of use study. This did lead to differences in the housing and demographic characteristics of the Winter 2012 sample compared to earlier samples. However, by using the same weighting scheme as in previous years, which is based on education and home ownership status, we have minimized the impact of this sampling strategy on the study's results.

## Summary of Findings

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

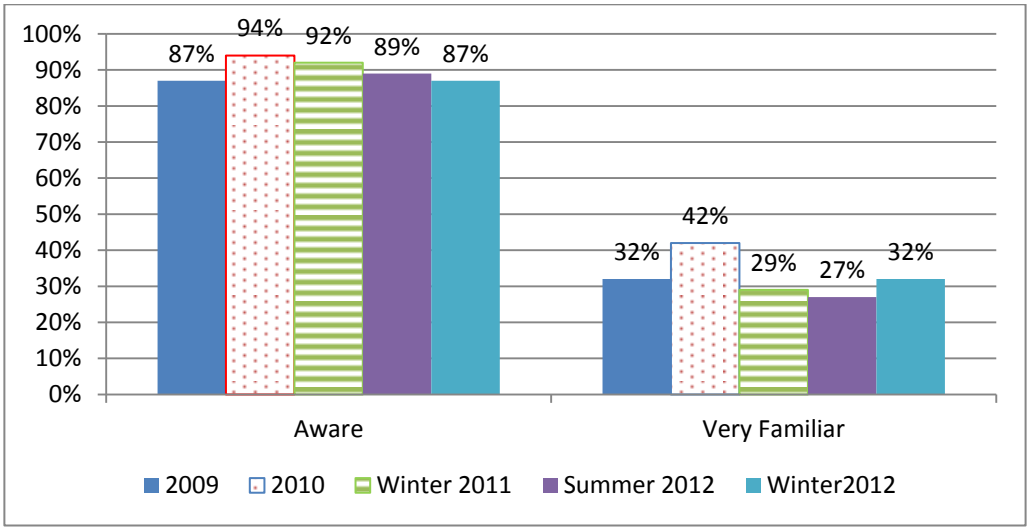
### Awareness of Energy-Saving Light Bulbs

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

[2] NMR recently completed a similar analysis for another lighting program administrator, but the report remains under review (as of March 1, 2013).

Nearly all respondents in Winter 2012 (87%) 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 the same as that measured in 2009 and comparable to awareness measured in subsequent waves. The percentage of respondents who said that they were "very familiar" with CFLs in Winter 2012 was 32%; the highest percentage since 2010.

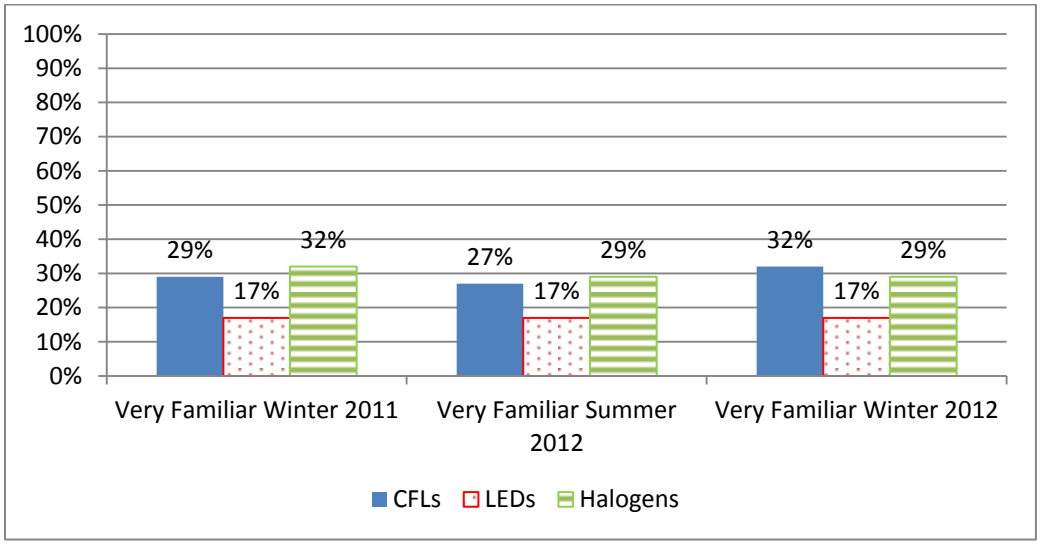
**Figure ES-1: CFL Awareness and Familiarity, 2009 to Winter 2012**



Familiarity with all types of specialty CFLs (specifically, dimmable, 3-way, flood/recessed, candelabra, globe, and A-line versions) increased from 2010 to Winter 2012, with the increase likely reflecting the PA's 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.

Seventeen percent of respondents reported being "very familiar" with A-line screw-in LEDs in Winter 2012, the same percentage as in the Summer 2012 and Winter 2011 surveys; 29% of respondents said they were familiar with A-line, screw-in halogen bulbs, the same percentage as Summer 2012 and a similar percentage as reported in Winter 2011 (Figure ES-2). Based on work the Team has conducted elsewhere that showed very little familiarity with halogen bulbs,[3] we suspect that respondents may have confused halogen bulbs meant to replace incandescents with other types of halogen bulbs. It is also worth noting that CFL experts (i.e., those that self-report using five or more CFLs) were significantly more likely than CFL novices to report being familiar with screw-in LEDs—56% of experts said they were somewhat or very familiar with LEDs compared to 39% of novices.

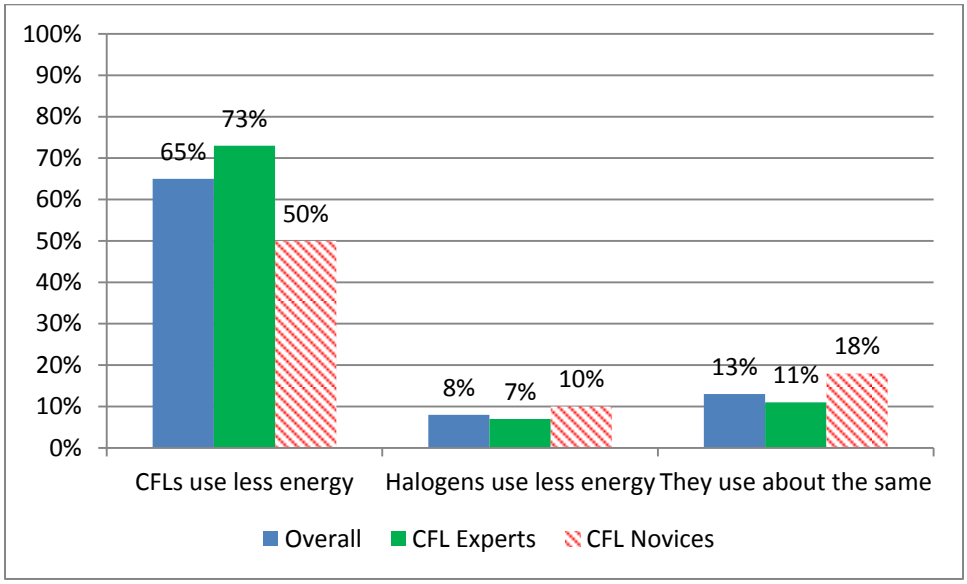
**Figure ES-2: Familiarity with CFLs, LEDs, and Halogen Bulbs**




[3] 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

Most respondents (65%) who voiced awareness of both CFLs and halogens correctly concluded that CFLs use less energy than halogens. As this overall number represented a slight decrease from prior years we also assessed respondents' judgments by CFL expertise.[4] As expected, CFL experts (73%) were more likely to correctly identify CFLs as using less energy than halogens compared to novices (50%) (Figure ES-3).

**Figure ES-3: Judgments about Relative Energy Use by CFL Expertise**



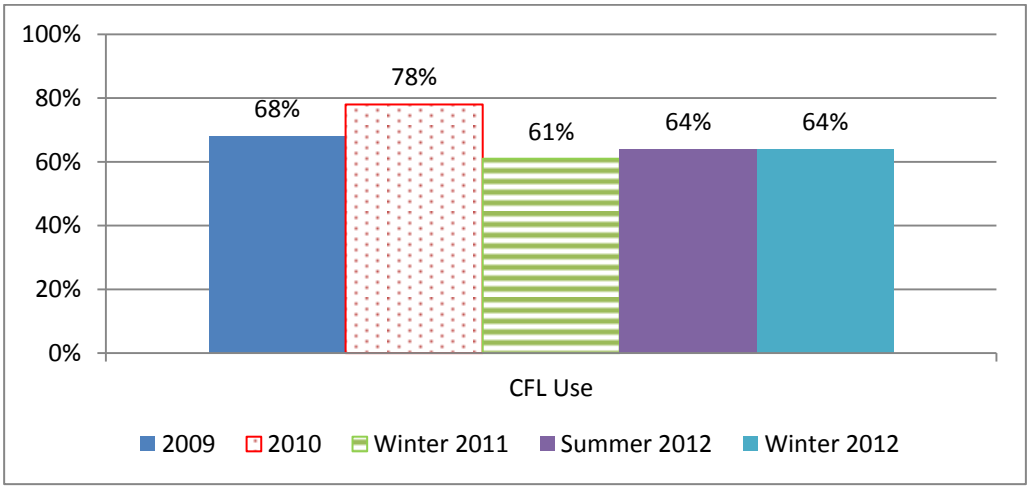

Approximately two out of five (41%) Winter 2012 respondents indicated that they had heard news stories about lighting products in the past year. The most frequently remembered content of the stories included the incandescent phase-out (mentioned by 30% of respondents), that CFLs contained mercury and required careful disposal (29%), that newer bulb types were more energy efficient (19%), the positive aspects of LED bulbs (14%), and comparisons of newer and older bulb types (13%). The percentages for CFL mercury/disposal issues and positive LED characteristics both represented significant increases from Summer 2012.

[4] For the purposes of this evaluation CFL experts are defined as those with five or more CFLs currently installed in their homes while CFL novices are defined as those with four or less, including zero CFLs installed and those not aware of CFLs.

## Use of Various Lighting Technologies

When asked if they had ever used CFLs, 64% of Winter 2012 respondents said that they had used them (Figure ES-4). This percentage is identical to Summer 2012 and statistically similar to self-reported use in 2009 and Winter 2011, but 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. We will continue to track actual CFL use in the forthcoming onsite saturation study.

**Figure ES-4: Respondents that have Ever Used CFLs, 2009 to Winter 2012**




A total of 80% of households say that they use at least one incandescent in their home, but only 23% of households self-reported use of the 100-Watt incandescent (covered by the first stage of EISA currently being implemented) and 36% reported use of the 75-Watt incandescent (the next bulb to be phased out). 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.

Thirteen percent of respondents reported using dimmable CFLs. 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 and ceiling/overhead lighting. We observed no differences in self-reported use of LEDs between CFL experts and novices.

## Recent Lighting Purchases

Only 9% of Winter 2012 respondents had shopped for 100-Watt incandescent light bulbs in the three months prior to the survey, a significant decrease from the 14% in Summer 2012. Of those who had shopped for the bulbs, less than one-half (49%) were able to find them on store shelves, a significant decrease from the 77% who were able to do so in Winter 2011 and the 63% able to do so in Summer 2012, revealing the influence of EISA on 100-Watt availability. Of course, this

also means that about one-half of the respondents still *did* find 100-Watt incandescents almost a year after the EISA phase-out began, suggesting a gradual impact of the legislation on the lighting market. Alternatively, 67% of 75-Watt incandescent shoppers were able to find those bulbs on store shelves. The few shoppers for 100-Watt and 75-Watt bulbs (27 respondents for each wattage) who could not find them on store shelves were most likely to buy a lower wattage incandescent rather than a CFL or LED, although CFLs were the second most common replacement purchased.

Turning again to all 600 respondents, 44% of respondents reported buying at least one type of light bulb in the three months prior to the survey. CFLs (20% of all 600 respondents) and incandescents (24% of respondents) were most commonly purchased although the Winter 2012 survey also showed a significant increase in purchases of LEDs compared to both Winter 2011 and Summer 2012. At least some respondents also reported buying halogens, fluorescent tubes, and pin-based CFLs or LEDs.

## Key Lighting Concepts

When asked what types of information they look for on bulb packing, 93% of Winter 2012 respondents report that they consider wattage, 87% consider price, and 67% consider wattage equivalency. These percentages are similar to those reported in the Summer 2012 survey. Other characteristics considered by more than one-half of the respondents included bulb life, bulb shape, the ENERGY STAR® label, and color appearance. The unprompted response percentages for watt equivalency, the ENERGY STAR label, and color appearance/color temperature all showed significant increases over Summer 2012 and Winter 2011.[5]

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 also explicitly asked respondents about their familiarity and understanding of these terms. Most consumers had heard of lumens (59%) and the terms “warm white” and “cool white” (72%), which were significantly higher percentages than those we observed in Winter 2011 for both sets of terms and Summer 2012 for “warm white” and “cool white." The differences were even more pronounced when looking at understanding of the terms by CFL expertise. More than three out of four (77%) CFL experts had heard of lumens, compared to only 46% of novices. Further, 87% of experts had heard of the terms “warm white” and “cool white” compared to 60% of novices.

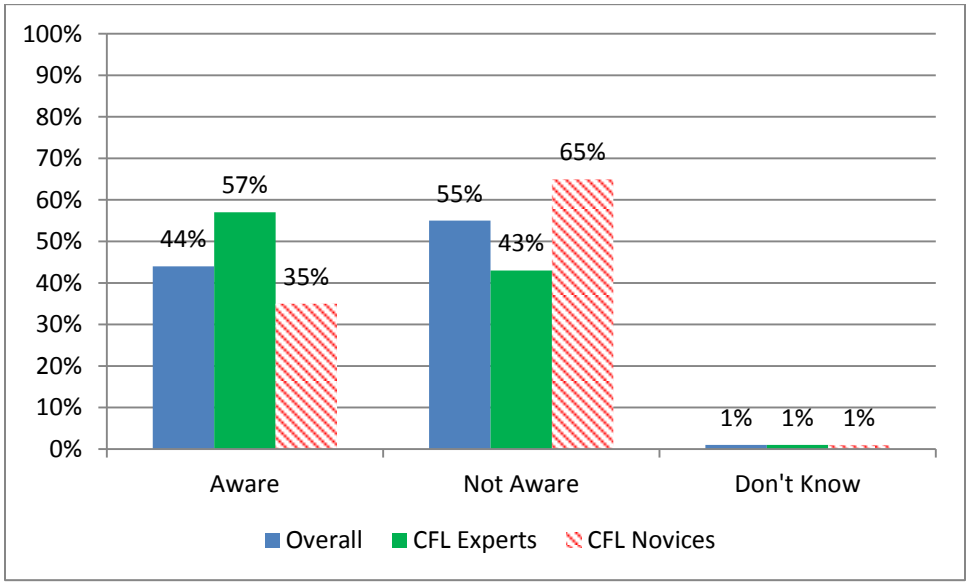
Of those who had heard these terms, 76% (or 48% of all 600 respondents) correctly understood that lumens referred to light output or brightness, which is comparable to the percentages in Summer 2012 and Winter 2011. Of those who had heard the terms “warm white” and “cool white,” 80% (or 60% of all 600 respondents) correctly identified them as referring to the color appearance of the bulb.

[5] That is, respondents volunteered that they consider the characteristics rather than being asked if they considered the characteristics.

## 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 (44%) of respondents reported being aware of the incandescent phase-out resulting from EISA; this is statistically similar to both the 47% observed in the Winter 2011 survey (which coincided with the initial implementation of the phase-out) and the 42% observed in Summer 2012. However, CFL experts (57%) were significantly more aware of the legislation than were CFL novices (35%) (Figure ES-5).

**Figure ES-5: EISA Awareness by CFL Expertise**




Even if they were 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 75-Watt incandescents were no longer available).[6] Respondents did not speak with one mind about their anticipated bulb purchases. The most popular choice (35%) was an 18 Watt screw-in CFL. Approximately one out of five (23%) respondents would choose a lower wattage incandescent bulb to replace a 75-Watt incandescent. Preferences for the other bulb choices were fairly even, with 11% choosing a higher wattage incandescent, 10% a screw-in LED, and 9% a screw-in halogen.

Interesting, although expected, trends emerged when looking at the same question by CFL expertise. The majority of CFL experts, not surprisingly, showed a preference for the CFL (64%) once 75-Watt incandescents are no longer available. Alternatively, only 12% of CFL novices chose that bulb, instead showing a preference for a lower wattage incandescent (34%).

[6] Because we asked about 100-Watt incandescents in earlier waves, direct comparisons of answers across surveys to these likely purchase questions are inappropriate as the factors that drive use of the two bulb wattages may differ.

When asked to explain their bulb choices, those who said they would buy CFLs or LEDs most often mentioned the energy savings associated with those bulbs and a preference for their light/color temperature/brightness. Respondents also noted the low price of CFLs or the fact that they were on sale, and the long bulb life of the LED. For both the lower wattage incandescent and the halogen, respondents noted familiarity with the bulbs and that they use less energy. The most popular reason for choosing a higher wattage incandescent was a preference for the bulb's light/color temperature/brightness, cited by over 80% of those choosing that bulb.

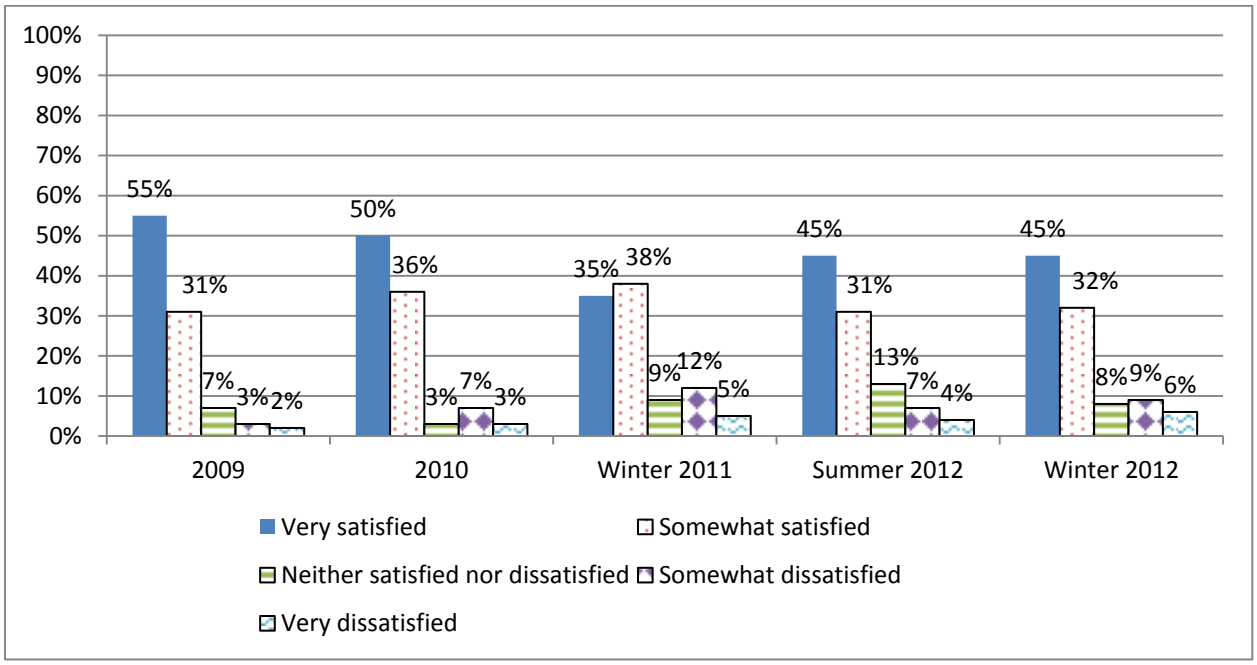
The possibility that consumers will buy many incandescent bulbs and save them for use after the incandescent phase-out has been the subject of much discussion in the energy-efficiency community and in the media discussions of EISA. The timing of the Winter 2012 survey gave us the opportunity to investigate not only potential stockpiling of 75-Watt incandescent bulbs in anticipation of their phase-out, but also respondents' self-reported stockpiling of 100-Watt incandescent bulbs. Our research concludes that one-fifth (20%) of all respondents said they were likely to engage in the "stockpiling" or "hoarding" of 75-Watt incandescent bulbs. However, when asked about their *actual* stockpiling of 100-Watt incandescents, only 9% of respondents reported having actually stockpiled those bulbs, although actual stockpiling behavior may differ from self-reported behavior and as consumers become more familiar with EISA and its implications for availability of incandescent bulbs. Both CFL novices and those aware of EISA were more likely to report that they would stockpile or had already stockpiled incandescents compared to CFL experts and those not aware of the legislation.

## CFL Price Awareness and Satisfaction

The percentage of respondents "very satisfied" with CFLs increased significantly from Winter 2011 to Summer 2012, with Winter 2012 respondents showing the same percentage as Summer 2012 (45%). These percentages remained statistically lower than satisfaction in 2009 but statistically similar to satisfaction in 2010 (Figure ES-6). As expected, CFL experts (50%) were more likely to indicate being "very satisfied" with the bulbs than CFL novices (34%).

Due to the concerns raised in response to the decreased levels of satisfaction found in the Winter 2011 survey, the Team added a question in Summer 2012 to determine if respondents' satisfaction with CFLs had changed over time, and, if so, why their opinions had changed. Similar to Summer 2012, roughly three out of four CFL users (73%) said their satisfaction with CFLs had stayed the same. Of those remaining, 17% said their satisfaction had increased, and only 9% replied that they were less satisfied with CFLs now than a year ago.

**Figure ES-6: CFL Satisfaction, 2009 to Winter 2012**




When asked what they did like about CFLs, respondents—both those who were and were 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 the time it takes for CFLs to brighten, and mercury/disposal problems (an issue which showed increased prevalence throughout the Winter 2012 survey). Looking at CFL expertise, we unexpectedly found that both experts and novices voiced similar concerns about CFLs and in similar percentages; these mirrored the concerns for the entire sample. However as expected, experts did cite a greater number and diversity of things they liked about CFLs when compared to novices. 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, Recommendations, and Considerations

In April of 2012, the Team delivered the Winter 2011 (first wave) consumer lighting report, which described EISA baseline conditions, as the survey coincided with the initial implementation of the new lighting standards. In October of 2012, the Team also delivered the Summer 2012 (second wave) consumer survey, which served as an interim check-in on the residential lighting market one-half year after the earliest phases of EISA implementation, and the Spring 2012 lighting saturation study, which provided information on residential lighting use during the early stages of EISA implementation. The current, Winter 2012, report assesses the residential lighting market a full year into EISA implementation to examine whether the phase-out of 100-Watt incandescent bulbs had affected consumer lighting behavior, and explore likely consumer reactions to the phase-out of 75-Watt incandescent bulbs, which became effective in

January 2013. The major conclusions, two recommendations, and a number of considerations are offered below.

*Conclusion 1*: The Winter 2012 survey provides evidence that customer satisfaction with CFLs remains steady, with roughly one-half of respondents being "very satisfied" with the bulbs, and three out of four being "very or somewhat" satisfied. These percentages represent an increase over those observed in Winter 2011, which now appear to be a negative outlier.[7] A persistent concern with CFLs in Winter 2012 relates to their mercury content and disposal issues.

> *Recommendation 1*: The Team suggests continued tracking of CFL satisfaction throughout future consumer surveys in order to see if satisfaction remains stable in the post-EISA period, when CFLs will face serious competition from less efficient screw-in halogen bulbs and very efficient and long-lasting screw-in LED bulbs.
>
> *Consideration 1*: The PAs have little direct control over the persistent concerns about CFLs containing mercury. This represents a limitation of the technology. However, the PAs can continue to work with program partners to educate consumers about the best ways to dispose of CFLs (including retailer, town, and municipality recycling opportunities) and to clean-up one that has been damaged.

*Conclusion 2*: The Winter 2012 survey was the first to look at important measures of CFL use, knowledge, and opinions based by expertise, determined by self-reported use of CFLs. The results show many important differences between those using many CFLs (experts) and those using few or none of the bulbs (novices). CFL experts demonstrated a high level of lighting "savvy" by being significantly more knowledgeable about relative bulb energy use, more aware of EISA legislation, more familiar with key lighting terminology, more likely to choose CFLs as a preferred bulb option under future EISA phase-outs, less likely to hoard incandescents, and more likely to report high levels of satisfaction with the bulb. Importantly, the two groups agree on the factors they "dislike" about the bulb, particularly being slow to turn on/brighten, and mercury/disposal issues. Novices tended to have lower levels of educational attainment and to live in smaller, rented, or multifamily homes. Experts tended to hold a Bachelor's degree or higher, and live in single-family homes which they owned.

> *Consideration 2a*: Promotional efforts to increase use of energy-efficient lighting specifically geared to those not currently using CFLs or only using small numbers of them would seem to have greater impact than those geared at CFL experts. A key to winning over CFL novices to CFLs or LEDs may be to highlight testimonials from those who have adopted the bulb, and are quite satisfied with the bulb's performance. Bulb giveaways may also offer an opportunity to increase novices' use of CFLs. Although the Team is not evaluating multifamily retrofit programs, the results do point to continued

[7] The 35% of respondents who reported being "very satisfied" with CFLs in Winter 2011 was significantly lower than any other of the Consumer survey waves. Given the consistency in this metric across all other waves, the Team concludes that CFL satisfaction is a relatively stable measure, and that the Winter 2011 numbers do not accurately reflect CFL satisfaction over time.

efforts to work with landlords and condominium associations to install efficient lighting in multifamily buildings.

*Consideration 2b*: Those already using large numbers of CFLs appear to have embraced the bulb type for many of their lighting needs, and report very high levels of satisfaction with them. However, it is likely that even CFL experts still have sockets that could be filled with specialty CFLs or with LEDs, providing at least some opportunities for gaining even greater savings from this lighting savvy group by stressing the diversity of lighting options available for numerous lighting scenarios and needs and the importance of changing out working but less-efficient bulbs for more efficient CFLs and LEDs.

*Consideration 2c:* Given the disparities observed between CFL experts and novices, the Team suggests continued tracking of these differences. Future surveys could include additional batteries of questions aimed at learning more about the source of differences between experts and novices.

*Conclusion 3*: A subset of Winter 2012 survey respondents explained in open-ended responses to certain questions that they wanted to move to LEDs as their preferred lighting source, but were hesitant to spend $20 for a light bulb. As LED technology continues to improve and the market matures, it is likely that the lumens achieved per watt will increase, the price of the bulb will come down, and consumers will become convinced of the bulb's long life. At that point, more of them may be willing to pay the higher price for LEDs over halogens or CFLs. They also address some of the respondents' issues with CFLs, most notably, mercury content and slowness to brighten, although conflicting reports still exist on dimmability.

*Consideration 3a*: In trying to increase adoption of LEDs, the PAs may want to consider educational materials that highlight the advantages of LEDs, but in a manner that does not denigrate CFLs. Further, the PAs should likely continue their efforts to keep the upfront cost of LEDs down while still maintaining program cost effectiveness.

*Consideration 3b*: The PAs could explore the optimal price point for LEDs in future evaluations and market assessments.

*Conclusion 4*: The timing of the Winter 2012 survey allowed us to shift the focus from the phase-out of the 100-Watt incandescent to the forthcoming phase-out of the 75-Watt incandescent bulb. When asked what bulb they would be likely to choose when the 75-Watt incandescent is no longer available, we noted an increase in consumers planning to move to a higher watt incandescent, although they would have to move to a 150-Watt or higher bulb to do this, and wattage limitations on fixtures may preclude this behavior.

*Consideration 4*: As new phases of the EISA legislation take shape it will be important to remind consumers that CFLs and other efficient lighting technologies come in wattages/lumens that are equivalent to various incandescent bulbs with which they are familiar. Even those currently using the popular 23-Watt CFL (meant to replace a 100-Watt incandescent) may not be familiar with the 18-Watt CFL we queried about in the

current survey that is meant to replace the 75-Watt incandescent. Continued efforts that emphasize the importance of lumens rather than Watts for judging brightness and choosing bulbs may cut down on bin jumping. Such efforts could be enhanced with the assistance of retailers in terms of the point-of-purchase signage and limiting the availability of higher wattage incandescents.

*Recommendation 4:* Despite evidence that some consumers are having difficulties finding 100-Watt incandescent bulbs on store shelves, one-half of shoppers for these bulbs were able to buy them. Therefore, if they are not already doing so, when developing energy and demand savings assumptions post-EISA, the PAs should consider assuming that the former "baseline" incandescent bulbs will remain available for at least one year and not adjust their delta Watts to account for lower energy use of halogens or other bulb types until after that year.

*Conclusion 5:* Respondents to all three survey waves reported relatively low levels of familiarity with A-line CFLs, although there was a slight increase in familiarity with the bulb in Winter 2012 (16% reported being very familiar up from 13%).

*Consideration 5:* 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 suggests continued focus on PA educational and promotional efforts toward A-line CFLs, particularly the "instant-on" styles. The Team is also in support of the PAs' plans for 2013-2015 to consider them more as a "standard" CFL rather than a specialty one (although we understand that from manufacturing and incentive perspectives, the A-line costs more than spirals), as most A-line CFLs will be used in general service and not specialty applications.

*Conclusion 6*: The results presented for Winter 2012 show that one-fifth of respondents will consider stockpiling incandescent bulbs in light of the 75-Watt phase-out. The numbers increase for those aware of EISA prior to the survey and for CFL novices. Further, both the Winter 2011 and Summer 2012 surveys as well as the onsite saturation effort suggested that about one-fourth of respondents would consider stockpiling 100-Watt incandescents, and that some respondents had already started to do so. Yet, only 9% of respondents reported actual stockpiling of 100-Watt incandescents in Winter 2012.

*Consideration 6:* NMR suggests that the PAs continue to consider the feasibility of 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. The Team is aware of websites, point of purchase displays, and pamphlets that show consumers the types of energy-efficient bulbs available for different applications and fixture types.

*Conclusion 7:* Consumers are becoming more familiar with the term "lumens" and understand that it means light output or brightness, but they still buy bulbs based on wattage or wattage equivalence.

> *Consideration 7:* We believe that the suggestion made in the Winter 2011 and Winter 2012 reports that the PAs continue their efforts at helping consumers make the transition from thinking about Watts to thinking about lumens remains relevant.

# 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 (hereafter the Team). The research presented here compares the results of a telephone survey (hereafter the Winter 2012 survey), performed between December 4, 2012 and January 21, 2013, with the results of two similar surveys (hereafter the Winter 2011 and Summer 2012 surveys) performed between December 8, 2011 through January 19, 2012 and June 18, 2012 and August 2, 2012, respectively.[8] The Winter 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 both the Summer 2012 and Winter 2012 surveys searched for possible changes in the lighting market since the initial implementation of EISA. As the different survey fielding periods correspond with various bulb phase-outs, we have assessed respondents' opinions and behaviors with an eye toward the pertinent changes. Of particular note to the current report is an effort to garner responses toward 75-Watt incandescent bulbs as well as the 100-Watt incandescent bulbs that were the focus of the Winter 2011 and Summer 2012 reports. The phase-out of the 75-Watt incandescent began in January 2013, while that of the 100-Watt incandescent began in January 2012. When possible, the Team also compares the more recent results to those obtained from lighting surveys conducted in 2009 and 2010.

## 1.1 Background

The Team fielded the consumer surveys with households in Massachusetts that were electric customers of one of the Program Administrators. 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 as EISA implementation moves forward. The results from the current survey are also compared to the Winter 2011 and Summer 2012 waves of the survey. Topics addressed in the 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

[8] 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.

- Satisfaction with CFLs and aspects of the bulbs that respondents like and dislike
- 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 and 75-Watt incandescents (Winter 2012 only) to identify stockpiling of incandescent bulbs
- Familiarity with lighting terminology such as lumens and color temperature
- Household demographics

## 1.2 Methodology

The most notable change in methodology for the Winter 2012 survey involved the sampling procedure. The current survey was also used to recruit households for the in-progress multi-state Regional Hours of Use (HOU) effort. The sample design for the HOU study called for securing comparable numbers of single-family and multi-family homes. Therefore, the Winter 2012 survey drew 48% of the sample from multifamily homes, while such homes represented no more than 24% of the cases in the two previous survey waves (see Table 8-1). While we believe that the use of similar weighting assumptions across the three waves reduced any bias created by the oversampling of multifamily homes, we take care to indicate those findings for which the over sampling of multifamily homes may have influenced the results compared to the previous survey waves. Aside from this altered sampling approach, the Winter 2012 survey methodology was the same as previous waves.

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 on the next page.[9] 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 600 completions, which achieves a three percent sampling error for the entire sample at the 90% confidence level, assuming a 50% break in responses. In order to secure the necessary multifamily sample for the HOU study, the final sample for each PA differed slightly from the desired sample as we were most successful at securing multifamily respondents from among NSTAR customers. The sampling errors for individual PAs ranged from a low of five percent for

[9] NSTAR and WMECO were sampled separately although both are now a part of Northeast Utilities.

National Grid and NSTAR to 26% for Unitil, due to its small population size.[10] The overall response rate was 17% and no less than 14% for each PA. We performed five 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 | 31 | 15.0% | 23.6% |
| National Grid | 1,117,912 | 288 | 266 | 5.1% | 17.4% |
| NSTAR | 954,917 | 210 | 240 | 5.3% | 14.5% |
| Unitil | 40,087 | 12 | 11 | 26.0% | 24.0% |
| WMECO | 187,140 | 48 | 52 | 11.5% | 25.3% |
| *Overall* | *2,502,047* | *600* | *600* | *3%* | *17%* |

[10] 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.

Table 1-2 presents the weighting scheme used in Winter 2012. When compared to Massachusetts as a whole, the consumer survey sample contained a greater proportion of households with people who had some education beyond the high school diploma. Although the new sampling procedure described above led to a larger number of renters in Winter 2012 than in previous survey waves (see Weighting Schemes from Previous Survey Waves), the Winter 2012 sample still had a higher proportion of home owners than exists in the population of Massachusetts households.[11] In response, the Team again 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; this weighting scheme is also comparable to those used in previous survey waves and in 2009 and 2010 consumer surveys.

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

| | Households | Sample Size | Weight |
|---|---|---|---|
| *State Total* | *2,512,552* | *600** | |
| **Owner-occupied housing units** | | | |
| Less than high school graduate | 106,875 | 7 | 3.65 |
| High school graduate | 367,185 | 59 | 1.49 |
| Some college or Associate's degree | 397,959 | 97 | 0.98 |
| Bachelor's degree or higher | 736,455 | 205 | 0.86 |
| **Renter-occupied housing units** | | | |
| Less than high school graduate | 155,720 | 17 | 2.19 |
| High school graduate | 251,964 | 40 | 1.50 |
| Some college or Associate's degree | 226,427 | 54 | 1.00 |
| Bachelor's degree or higher | 269,967 | 110 | 0.59 |

* Eleven 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 among some of most critical indicators in the study. We focus most of these tests on the results for Winter 2012, Summer 2012 and Winter 2011, but we do sometimes provide statistical tests with 2009 and 2010 as well.

[11] 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 Summer 2012 Massachusetts consumer surveys. We also asked respondents whether they were aware of the EISA light bulb efficiency provisions. In those cases we compare the Winter 2011, Summer 2012, and Winter 2012 results as questions about EISA awareness asked in earlier years used substantially different wording, limiting their comparability to the recent waves.

## 2.1 CFL Awareness, Familiarity, and Expertise

Approximately nine out of ten respondents in Winter 2012 (87%) indicated that they were aware of CFLs before responding to the survey (Table 2-1). This represents a significant decrease in awareness from 2010 (94%) and Winter 2011 (92%), but is still within historical rates of awareness measured from 2009 onward, and shows no difference from the Summer 2012 results (89%), assessed just six months earlier.

**Table 2-1: Awareness of CFLs**

(Base: All respondents)

| Awareness | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample size* | *503* | *381* | *582* | *604* | *600* |
| Yes | 87% | 94%ψ | 92%ψ | 89%*$^{\infty}$ | 87%*$^{\infty}$ |
| No | 13% | 6% | 8% | 11% | 13% |
| Don't know/refused | - | - | - | - | - |

ψ "Yes" significantly different from 2009 at the 90% confidence level.
$^{\infty}$ "Yes" significantly different from 2010 at the 90% confidence level.
* "Yes" significantly different from Winter 2011 at the 90% confidence level.

More than two out of three respondents in Winter 2012 indicated that they were somewhat or very familiar with CFLs (69%) (Table 2-2). This percentage is similar to that from the Winter 2011 (69%) and Summer 2012 surveys (68%). However, the Winter 2012 survey showed a significant increase over Summer 2012 in the percentage of respondents who reported being "very familiar" with CFLs (32% vs. 27%). Furthermore, rates of being "not too familiar" with CFLs have shown a significant decline from 17% in Winter 2011 to 13% in Winter 2012. In short, results from the three waves of surveys conducted since 2010 continue to suggest that the 2010 survey appears to be the "odd" year in terms of reported levels of CFL awareness and familiarity.[12]

**Table 2-2: Familiarity with CFLs**

(Base: All respondents)

| Familiarity with CFLs | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample size* | *503* | *381* | *582* | *604* | *600* |
| Very familiar | 32% | 42%ψ | 29%∞ | 27%ψ∞ | 32%∞* |
| Somewhat familiar | 39% | 38% | 40% | 41% | 37% |
| Not too familiar | 11% | 9% | 17% | 16% | 13% |
| Not at all familiar | 5% | 5% | 6% | 5% | 4% |
| Not aware of CFLs | 13% | 6% | 8% | 11% | 13% |
| Don't know / refused | 1% | 0% | <1% | <1% | 1% |

ψ "Very familiar" significantly different from 2009 at the 90% confidence level.
∞ "Very familiar" significantly different from 2010 at the 90% confidence level.
* "Very familiar" significantly different from Summer 2012 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. Levels of familiarity with specialty CFLs in Winter 2012 showed stability with the Summer 2012 results, particularly for those reporting high levels of familiarity. Optimistically, Winter 2012 respondents reported the highest levels of being "very familiar" with A-line CFLs, a bulb the Team has previously suggested is important as it closely resembles incandescent bulbs in shape and fixture fit. Furthermore, comparisons between 2010 and mid/Winter 2012 indicate the three year trend in familiarity with specialty CFLs exhibits increases for most bulb types. The differences over time could be attributed to differences in the sample composition, but are 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.

[12] As in Summer 2012, however, the Team explored other possible reasons for the reported decreases since 2010 by analyzing exposure to media stories about lighting and explanations for possible changes in CFL satisfaction, as reported in Section 7.

## 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 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| | *Sample Size* | *381* | *582* | *604* | *600* |
| Dimmable | Very familiar | 12% | 17% | 15% | 14% |
| | Somewhat familiar | 19% | 23% | 25% | 20% |
| | Not too familiar | 14% | 11% | 15% | 15% |
| | Not at all familiar | 44% | 35% | 30% | 33% |
| | Not aware of CFLs | 11% | 14% | 16% | 18% |
| | Don't know / refused | <1% | 1% | - | <1% |
| 3-way | Very familiar | 16% | 19% | 19% | 20% |
| | Somewhat familiar | 20% | 25% | 27% | 21% |
| | Not too familiar | 15% | 11% | 11% | 12% |
| | Not at all familiar | 36% | 32% | 28% | 29% |
| | Not aware of CFLs | 11% | 14% | 16% | 18% |
| | Don't know / refused | <1% | <1% | - | <1% |
| Flood or Recessed | Very familiar | 16% | 22% | 17% | 20% |
| | Somewhat familiar | 16% | 21% | 30% | 20% |
| | Not too familiar | 13% | 12% | 13% | 14% |
| | Not at all familiar | 41% | 33% | 24% | 28% |
| | Not aware of CFLs | 11% | 14% | 16% | 18% |
| | Don't know / refused | 3% | <1% | - | - |
| Candelabra | Very familiar | 9% | 16% | 17% | 13% |
| | Somewhat familiar | 17% | 19% | 23% | 17% |
| | Not too familiar | 13% | 17% | 13% | 14% |
| | Not at all familiar | 48% | 35% | 31% | 38% |
| | Not aware of CFLs | 11% | 14% | 16% | 18% |
| | Don't know / refused | 1% | 1% | - | <1% |
| Globe | Very familiar | 18% | 20% | 19% | 19% |
| | Somewhat familiar | 24% | 24% | 26% | 23% |
| | Not too familiar | 13% | 16% | 15% | 11% |
| | Not at all familiar | 33% | 27% | 24% | 29% |
| | Not aware of CFLs | 11% | 14% | 16% | 18% |
| | Don't know / refused | <1% | <1% | - | 1% |
| A-line | Very familiar | 14% | 14% | 13% | 16% |
| | Somewhat familiar | 14% | 18% | 21% | 18% |
| | Not too familiar | 16% | 13% | 18% | 14% |
| | Not at all familiar | 44% | 42% | 33% | 34% |
| | Not aware of CFLs | 11% | 14% | 16% | 18% |
| | Don't know / refused | 1% | <1% | <1% | <1% |

For the first time in the Winter 2012 survey, we included an item assessing respondents' experience using CFLs based on the self-reported number of CFLs installed in their homes. The CFL expertise item and subsequent analyses attempt to track how important lighting market indicators, opinions about bulbs, and lighting knowledge might differ between CFL experts (those who currently report using five CFLs or more) and CFL novices (those who currently report using four CFLs or less, including zero CFLs).[13,14] In the current sample, 56% of all households were defined as CFL novices (including those not aware of CFLs), and 44% as experts (Table 2-4). When looking at those respondents who had at least one CFL currently installed, the sample includes a greater proportion of CFL experts (76%) than novices (24%).

**Table 2-4: CFL Novices vs. Experts**

(Base: Respondents with CFLs Currently Installed and All Households)

| How Many CFLs Installed | CFLs Currently Installed | All Households |
|---|---|---|
| *Sample Size* | *365* | *600* |
| Novice (0 to 4 CFLs installed) | 24% | 56% |
| Expert (5+ CFLS installed) | 76% | 44% |

## 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.[15] All three waves of the consumer survey assessed familiarity with CFLs, as well as these other energy-saving bulb types. Close to one-half (46%) of Winter 2012 respondents reported being very familiar or somewhat familiar with LEDs, up from 41% in Winter 2011, including a statistically significant increase in those saying they were somewhat familiar with LEDs (Table 2-5). LED results were similar in mid and Winter 2012. Winter 2012 also saw the largest percentage of respondents reporting being "very familiar" with CFLs (32%) over the last three survey waves. Almost two out of three respondents (64%) reported being very or somewhat familiar with halogens, which is statistically similar to the percentages from Summer 2012 (65%) and Winter 2011 (69%).[16]

[13] NMR warns that the actual number of CFLs that respondents self-report using is not likely accurate; however, it is likely that this question captures those who use "a lot" of CFLs and those who use very few of them.

[14] Similar analyses conducted in other States showed differences between "experts" and "novices" on these topics; these other reports are still under review at the time of writing (February 2013), but NMR anticipates they will be available by June 2013.

[15] 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.

[16] NMR Group, Inc. 2011. "Connecticut Lighting Focus Groups: Exploration of Market and Reactions to Various Efficient Lighting Choices." 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, where very few respondents had seen A-line halogens when shown them during the focus group. Available at http://www.ctenergyinfo.com/111121%20EISA%20Lighting%20Focus%20Groups%20Report.pdf

## Table 2-5: Familiarity with Energy-Saving Bulb Types 2011, 2012, 2013

(Base: All respondents)

| Familiarity | CFLs | | | LEDs | | | Halogen Bulbs | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| *Sample size* | *582* | *604* | *600* | *582* | *604* | *600* | *582* | *604* | *600* |
| Very familiar | 29% | 27% | 32%∞ | 17% | 17% | 17% | 32% | 29% | 29% |
| Somewhat familiar | 40% | 41% | 37% | 24% | 30%* | 29%* | 37% | 36% | 35% |
| Not too familiar | 17% | 16% | 13%* | 25% | 21% | 24% | 12% | 17%* | 17%* |
| Not at all familiar | 14% | 16% | 17% | 34% | 31% | 30% | 19% | 18% | 19% |
| Don't know / refused | <1% | <1% | 1% | <1% | <1% | <1% | <1% | - | <1% |

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

∞ Significantly different from Summer 2012 at the 90% confidence level.

The Team also considered how familiarity with energy efficient bulb types might differ by CFL expertise. Not surprisingly, CFL experts displayed significantly higher levels of familiarity with CFLs than did CFL novices (Table 2-6). They were also, however, significantly more familiar with LEDs, suggesting that those who have adopted CFLs for many of their lighting needs are also more acquainted with other types of energy efficient lighting. It is worth noting here that an examination of demographic differences between CFL novices and experts (see Section 8.1) reveals that experts tended to live in larger, single family homes, and were more likely to own their homes than CFL novices (who show higher levels of renting/leasing). To the extent that larger homes also have more sockets, greater familiarity with energy efficient bulbs by experts may be influenced by having more sockets in which to use them. Further, some respondents who rent or lease their homes often indicated that the landlord or owner was in charge of purchasing and replacing bulbs, leading to lower levels of familiarity among renters.

### Table 2-6: Familiarity with CFLs and LEDs by CFL Expertise

(Base: All respondents)

| Familiarity | CFLs | | | LEDs | | |
|---|---|---|---|---|---|---|
| | **Overall** | **CFL Expert** | **CFL Novice** | **Overall** | **CFL Expert** | **CFL Novice** |
| *Sample size* | *600* | *269* | *329* | *600* | *269* | *329* |
| Very familiar | 32% | 55%* | 15%*Ω | 17% | 26%* | 10%*Ω |
| Somewhat familiar | 37% | 38% | 35% | 29% | 30% | 29% |
| Not too familiar | 13% | 7%* | 19%*Ω | 24% | 21% | 25% |
| Not at all familiar | 17% | 0%* | 30%*Ω | 30% | 24%* | 35%Ω |
| Don't know / refused | 1% | 0% | 2% | <1% | 0% | 1% |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

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 Winter 2012 respondents (65%) correctly said that CFLs use less energy than halogen bulbs (Table 2-7), indicating, as did the similar results in Winter 2011 and Summer 2012, that the respondents' knowledge of energy-saving bulb types goes beyond simple awareness of the bulbs' existence. Although the proportion of respondents correctly identifying CFLs as more energy saving was lower in Winter 2012 than Summer 2012, it is important to note that the different sampling procedures used in Winter 2012 may have influenced this result despite the use of consistent weighting scheme over time. The remaining respondents were more likely to think that the two bulbs used the same amount of energy, as opposed to halogens using less. Similar to the Winter 2011 and Summer 2012 results, when comparing respondents who self-reported being "very familiar" or "somewhat familiar" with CFLs, those most familiar with CFLs in Winter 2012 more frequently identified the CFL as the lower energy user of the two (70% for very familiar vs. 57% for somewhat familiar).

### Table 2-7: 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 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| *Sample size* | *327* | *317* | *304* | *156* | *142* | *158* | *171* | *175* | *146* |
| CFLs use less energy | 70% | 72% | 65%** | 81%* | 78% | 70% | 63%Ω | 68%Ω | 57%Ω |
| Halogens use less energy | 9% | 10% | 8% | 9% | 8% | 7% | 10% | 10% | 10% |
| They use about the same | 9% | 9% | 13% | 3%* | 9%** | 12% | 14% | 10% | 15% |
| Don't know/refused | 11% | 9% | 14%** | 7% | 6% | 11% | 14% | 12% | 18% |

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

** Significantly different at the 90% confidence level from Winter 2011 to Summer 2012 or Summer 2012 to Winter 2012.

Ω Significantly different from 'Very Familiar' at the 90% confidence level.

When looking at CFL experts vs. novices, the differences in judgments of relative energy use were even more pronounced. Compared to the overall sample (65%), CFL experts (73%) were significantly more likely to identify CFLs as using less energy, and CFL novices (50%) were significantly less likely to do so (Table 2-8). Experts (9%) were also significantly less likely than the overall sample (14%) to indicate not knowing which bulb uses less energy and novices (22%) were significantly more likely to do so. These results suggest that using more CFLs is associated with greater knowledge of how much energy various bulbs use.

**Table 2-8: Respondents' Judgments about Relative Energy Use by CFL Expertise**

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

| Which bulb uses less energy | Expert vs. Novice | | |
|---|---|---|---|
| | Overall | CFL Expert | CFL Novice |
| *Sample size* | *304* | *193* | *109* |
| CFLs use less energy | 65% | 73%* | 50%*Ω |
| Halogens use less energy | 8% | 7% | 10% |
| They use about the same | 13% | 11% | 18% |
| Don't know/refused | 14% | 9%* | 22%*Ω |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

## 2.3 Awareness of EISA and Media Attention to Light Bulbs

The Team asked respondents a series of questions about their exposure to media reports 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 consumers 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 Winter 2011 results as a possible reason for changes in self-reported CFL use and satisfaction (see Section 3.2 and Section 7).

In Summer 2012 the survey found that almost one-half (45%) of the respondents indicated that they had heard news stories about lighting products in the past year, and the current version of the survey found comparable but slightly lower rates of media exposure (41%) (Table 2-9).

**Table 2-9: Whether Has Seen or Read any News Stories about Light Bulbs in Past Year**

(Base: All Respondents)

| Have seen/heard news stories about light bulbs in past year? | Summer 2012 | Winter 2012 |
|---|---|---|
| *Sample size* | *604* | *600* |
| Yes | 45% | 41% |
| No | 54% | 58% |
| Don't know/refused | 1% | 1% |

Those having heard lighting-related news stories were asked to recall what the news story was about. Thirty percent of respondents in both Summer 2012 and Winter 2012 mentioned they had heard that traditional bulbs were being taken off the market or phased out, indicating awareness of the EISA legislation (Table 2-10). About one-third (29%) of respondents in Winter 2012 reported that they had heard that CFLs were dangerous because of mercury and needed careful disposal, a significant increase over Summer 2012 (19%).[17] Also showing significant increase from Summer 2012 were recollections of stories about the positive aspects of LED bulbs. In addition, significantly fewer respondents in Winter 2012 had heard stories about consumers disliking CFLs compared to Summer 2012, indicating that negative media attention toward CFL performance may be decreasing. In Section 7, we explore whether exposure to these stories has influenced satisfaction with CFLs. Other responses noted the energy efficiency of new bulb types, comparisons between "old" and "new" bulbs, the long life and price of efficient lighting, and the increased diversity of bulbs on the market.

### Table 2-10: 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) | Summer 2012 | Winter 2012 |
|---|---|---|
| *Sample size* | *295* | *264* |
| Traditional bulbs are being taken off the market/phased out | 30% | 30% |
| CFLs are dangerous because of mercury/Proper disposal of CFLs | 19% | 29%* |
| New bulbs are more energy efficient/Save energy and money | 24% | 19% |
| Positive aspects of LEDs/We should be using LEDs | 7% | 14%* |
| How new bulbs compare to older bulbs in terms of wattage/price/brightness | 13% | 13% |
| LED/CFLs last longer but are more expensive | 12% | 10% |
| We should be switching over to efficient lighting | 5% | 8% |
| New bulbs coming on the market | 4% | 4% |
| Many consumers do not like CFLs | 6% | 1%* |
| New bulbs come in different shapes | 1% | 0% |
| Other | 9% | 8% |
| Don't know/refused | 3% | 4% |

* Significantly different from Summer 2012 at the 90% confidence level.

[17] Increased attention to CFL contents and disposal was increasingly on the minds of the late-2012 survey respondents, and is discussed more in Section 7.

The Winter 2011 and 2012 surveys also directly asked respondents' about their awareness of the EISA legislation that bans most incandescent light bulbs. Forty-four percent of Winter 2012 respondents had heard about the EISA legislation; the results do not differ statistically from either Summer 2012 (42%), which showed a slightly lower EISA awareness or Winter 2011 when the percentage was slightly higher (47%) (Table 2-11). If anything, the slight variations in EISA awareness over time may be related to the timing of the surveys—the Winter 2011 survey was in the field when the 100-Watt phase-out went in effect; the 2012 surveys occurred six and 12 months later when the phase-out was getting less media attention, even though the 75-Watt phase-out began in January 2013. 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 2-11: Awareness of EISA Law**

(Base: All Respondents)

| Have heard about EISA law | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|
| *Sample size* | *582* | *604* | *600* |
| Yes | 47% | 42%* | 44% |
| No | 53% | 58%* | 55% |
| Don't know/refused | - | - | <1% |

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

Interestingly, self-reported CFL use had a significant influence on EISA awareness. Compared to the 44% of respondents who had heard about EISA legislation overall, awareness increased to 57% among CFL experts and dropped to only 35% among CFL novices (Table 2-12). Both differences were statistically significant. As with knowledge of relative energy use, it appears that higher levels of CFL use are also associated with being more informed about changes in the lighting market. Because some respondents who rent or lease their homes are not responsible for purchasing or installing light bulbs, however, at least some of the differences in EISA awareness between CFL experts and novices could be explained by novices' higher levels of renting.

**Table 2-12: Awareness of EISA Law by CFL Expertise**

(Base: All Respondents)

| Have heard about EISA law | Overall | CFL Expert | CFL Novice |
|---|---|---|---|
| *Sample size* | *600* | *269* | *329* |
| Yes | 44% | 57%* | 35%*Ω |
| No | 55% | 43%* | 65%*Ω |
| Don't know/refused | <1% | <1% | 1% |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert 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. Asking these questions in each survey wave served three purposes. First, in the Winter 2011 survey they established the types of bulbs customers self-reported using just prior to the start of the EISA implementation period; this allowed a comparison to those self-reported in use after the legislation had gone into effect (the two 2012 samples). 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, and if these indicators had changed over the course of the first year of EISA implementation. Finally, the questions helped 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 using the consumer survey and onsite lighting inventories to track customer use, saturation, and purchase of incandescent bulbs that would be subject to the current EISA regulations. For the Winter 2011 and Summer 2012 samples, this meant 100-Watt incandescents only, but for the Winter 2012 sample (and the forthcoming onsite saturation study), we expanded 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 and 75-Watt incandescent bulbs. In a finding consistent with the likely impact of EISA, the results suggest that use of 100-Watt incandescent has been decreasing over time—from 30% of respondents in Winter 2011 to 26% in Summer 2012, and 23% in Winter 2012 (Table 3-1). This 7% decrease from the Winter 2011 sample is statistically significant, and is suggestive—though does not prove—that the dwindling availability of 100-Watt incandescent bulbs on store shelves may be reducing consumer use of these bulbs. 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. The second onsite study, to be completed later this year, will continue to track this discrepancy in self-report of incandescents and actual use. However, it seems clear that 100-Watt incandescents do not account for a large percentage of the bulbs in respondents' homes.

Thirty-six percent of respondents reported using 75-Watt incandescents, but future tracking will be needed to see if use follows the same trend as 100-Watt incandescents. The second onsite study will also provide verification of the actual use of 75-Watt incandescents in homes in Massachusetts.

**Table 3-1: 100/75-Watt Incandescent Bulbs Installed in Home**

(Base: All Respondents)

| Any 100/75-Watt incandescent bulbs installed in home? | Winter 2011 (100W) | Summer 2012 (100W) | Winter 2012 (100W) | Winter 2012 (75W)** |
|---|---|---|---|---|
| *Sample size* | *582* | *604* | *600* | *600* |
| Yes | 30% | 26% | 23%* | 36% |
| No | 62% | 72%* | 72%* | 57% |
| Don't know/refused | 8% | 3%* | 5%*α | 7% |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 at the 90% confidence level.
** Statistical comparisons not run between different bulb types.

Respondents who did not use any 100-Watt (in Winter 2011 and Summer 2012) or 75-Watt (in Winter 2012 only) incandescents were asked why this was so. The observed differences in response over time, then, could reflect varying uses associated with each wattage bulb, the impact of EISA, or both. For example, the most common reason for why Summer 2012 and Winter 2011 respondents did not use 100-Watt incandescents was that the bulbs were too bright (28% and 26% respectively). However, the most common reason respondents cited for not using 75-Watt incandescents in Winter 2012 was their choice to use CFLs or more efficient lighting instead of the incandescent bulb (40%) (Table 3-2). Future tracking will have to clarify if this response is the result of EISA, of education about and availability of efficient lighting, or of the varying ways in which households use different wattage bulbs. Also interesting to note is that a comparable percentage of respondents in Winter 2012 (17%) and Summer 2012 (18%) indicated the respective bulb used too much energy, even though they were referring to bulbs of different wattages (75-Watts vs. 100-Watts, respectively). This may represent an important shift in the standard against which consumers view energy efficient lighting; clearly an important goal not only of EISA but also the PAs' residential lighting program. Other common responses in Winter 2012 were preferring to use a lower wattage incandescent (19%) and the 75-Watt bulb being too bright (18%).

### Table 3-2: Reasons 100/75-Watt Incandescent Bulbs Not Installed in Home

(Base: Respondents who do not currently use 100/75-Watt incandescent bulbs in their homes)

| Reasons (Multiple Response) | Winter 2011 (100W) | Summer 2012 (100W) | Winter 2012 (75W)** |
|---|---|---|---|
| *Sample size* | *350* | *410* | *329* |
| They are too bright | 26% | 28% | 18% |
| I use CFLs/halogens/efficient lighting | 17% | 24%* | 40% |
| Prefer to use a lower wattage incandescent | 11% | 21%* | 19% |
| They use too much energy | 29% | 18%* | 17% |
| My socket says only to use a certain Watt bulb/ fixtures won't take such high wattage | 6% | 14%* | 9% |
| Don't need them | 16% | 13% | 8% |
| Cost too much/want to save money | 6% | 5% | 3% |
| They are bad for the environment/not energy conscious | 2% | 1% | 2% |
| Because of EISA | 1% | <1% | 0% |
| Landlord chose bulbs/bulbs were already here | 1% | 3% | 4% |
| They are too hard to find/Can't find them | - | 3% | 2% |
| They don't last long/short bulb life | 1% | 1% | 2% |
| Other | 2% | 2% | 2% |
| Use 100-Watt/higher wattage bulb | 0% | 0% | 6% |
| Don't know/refused | 7% | 3% | 3% |

* Significantly different from Winter 2011 at the 90% confidence level (only run in Summer 2012).
** Statistical comparisons not run between different bulb types.

To get a sense of whether respondents still used incandescents, even if they did not use the 100-Watt or 75-Watt varieties, respondents who did not have either bulb installed revealed whether they had *any* incandescents installed. Although the majority of Winter 2012 respondents did not use 100-Watt or 75-Watt incandescents, they did use other wattages of incandescent bulbs. Among the subset of respondents not using 75-Watt or 100-Watt incandescents, roughly two out of three (65%) reported that they did use other wattages of incandescent bulbs (Table 3-3). Looking at the entire sample, 80% of respondents said that they used at least some wattage incandescents in their home. This is significantly different than the Winter 2011 and Summer 2012 respondents, but could reflect changes in the survey methods. In particular, respondents were given three chances to say whether they had any incandescents installed in their homes—any 100-Watt, any 75-Watt, and any other Watt bulb. It is possible that this repeated questioning boosted the percentage from what it had been in the earlier two waves when we did not ask about 75-Watt bulbs.

### 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 (or 75-Watt) Incandescents | | | All Households | | |
|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012** | Winter 2012*** | Winter 2011 | Summer 2012 | Winter 2012 |
| *Sample size* | *387* | *410* | *337* | *582* | *604* | *600* |
| Yes | 63% | 63% | 65% | 75% | 73% | 80%*α |
| No | 34% | 34% | 32% | 23% | 27%* | 20%α |
| Don't know/refused | 3% | 3% | 3% | 2% | - | - |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 at the 90% confidence level.
** The percentages for Winter 2011 and Summer 2012 are the same (once rounded).
*** Households not using 100W and 75W incandescents.

## 3.2 CFL Bulb Use

The survey also explored historic and current self-reported CFL use, comparing the results to those from 2009 onward. In the current survey, 64% of respondents had CFLs installed in their homes at some point—an identical percentage to Summer 2012 and a similar one to Winter 2011 (Table 3-4). However, the 16% of respondents in Winter 2012 who indicated never having a CFL installed is a significant increase from the 20% who said so in Winter 2011 (12%) (Table 3-4). Note that, as suggested in earlier reports, it appears that the 2010 sample was an outlier in terms of self-reported CFL use.

**Table 3-4: CFLs Ever Installed in Home**

(Base: All respondents)

| Have Ever Used a CFL | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample size* | *503* | *381* | *582* | *604* | *600* |
| Yes | 68% | 78% | 61% | 64% | 64% |
| No | 12% | 11% | 20% | 19% | 16%* |
| Don't know/Refused | 1% | <1% | 6% | 1%* | 3%*α |
| Not aware of / familiar with CFLs | 19% | 11% | 14% | 16% | 18%* |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 at the 90% confidence level.

The two waves of 2012 survey respondents who had used CFLs were asked to specify how long ago they first used a CFL. A large number of respondents self-reported using CFLs for the first time between one and four years ago (55% in Summer 2012 and 47% in Winter 2012) (Table 3-5). It appears that the Winter 2012 sample contained more respondents indicating longer use of CFLs, with greater percentages reporting their first use in both the five-to-six year and nine-to-ten year categories. Only five percent in either sample specified they began using them more than ten years ago, with a similarly small percentage (7%) reporting their first use within the past year.

**Table 3-5: When First Used a CFL**

(Base: Respondents who have ever used a CFL)

| How long ago first used a CFL bulb? | Summer 2012 | Winter 2012 |
|---|---|---|
| *Sample size* | *414* | *401* |
| Less than one year ago | 7% | 7% |
| 1 to 2 years ago | 29% | 28% |
| 3 to 4 years ago | 26% | 19%* |
| 5 to 6 years ago | 16% | 21%* |
| 7 to 8 years ago | 6% | 6% |
| 9 to 10 years ago | 7% | 12%* |
| More than 10 years ago | 5% | 5% |
| Don't know/Refused | 4% | 2% |

* Significantly different from Summer 2012 at the 90% confidence level.

When looking at duration of CFL use broken down by CFL expertise, additional differences come to light. A significantly greater percentage of CFL experts (those with five or more CFLs currently installed) reported first using a CFL one-to-two years ago compared to CFL novices (23% vs. 10%) (Table 3-6). However, more novices than experts report first use three-to-four years ago (20% vs. 38%). When looking at long term use, significantly more experts (21%) than novices (10%) first used CFLs nine years ago or more. It appears then, that those using large numbers of CFLs tend to be either seasoned veterans who have used the bulbs for many years, or recent users who have quickly adopted the bulb for most lighting needs, perhaps because of the availability of multipacks obtained through the residential lighting program.

### Table 3-6: When First Used a CFL by CFL Expertise

(Base: Respondents who have ever used a CFL)

| How long ago first used a CFL bulb? | Overall | CFL Expert | CFL Novice |
|---|---|---|---|
| *Sample size* | *401* | *269* | *130* |
| Less than one year ago | 7% | 6% | 10% |
| 1 to 2 years ago | 28% | 23% | 10%$^{*\Omega}$ |
| 3 to 4 years ago | 19% | 20% | 38%$^{*\Omega}$ |
| 5 to 6 years ago | 21% | 23% | 17% |
| 7 to 8 years ago | 6% | 7% | 4% |
| 9 to 10 years ago | 12% | 16% | 5%$^{*\Omega}$ |
| More than 10 years ago | 5% | 5% | 5% |
| Don't know/Refused | 2% | 0%* | 4%$^{\Omega}$ |

$^{*}$ Significantly different from overall at the 90% confidence level.
$^{\Omega}$ Significantly different from CFL Expert at the 90% confidence level.

The current and prior surveys also asked respondents to self-report whether they currently use any CFLs in the home. In the current sample, 58% of respondents self-reported having CFLs installed; a slight increase over the 55% in both Winter 2011 and Summer 2012, and a decrease from the 2010 and 2009 samples, in which 72% and 64% of respondents had CFLs respectively (Table 3-7). Importantly, the low rates of self-reported CFL use stand in contrast to the results of the first 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 a CFL bulb or their responses have been influenced by other factors, leading to the contradictory self-reported responses and onsite verified use. We will continue to track actual CFL use in respondents' homes in the forthcoming onsite saturation study.

### Table 3-7: CFLs Currently Installed in Home

(Base: All respondents)

| Currently Have CFLs Installed | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample Size* | *503* | *381* | *582* | *604* | *600* |
| Yes | 64% | 72%ψ | 55%ψʊ | 55%ψʊ | 58%ψʊ |
| No | 3% | 6% | 5% | 8%∞ | 5%ψα |
| Don't know / refused | 1% | 0% | 1% | <1% | <1% |
| Not aware of / familiar with CFLs* | 32% | 22% | 39% | 36% | 36%ʊ |

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

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

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

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

α Significantly different from Summer 2012 at the 90% confidence level.

In order to explore reasons why some households 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 in Winter 2012 indicated that they had stopped using CFLs, and these respondents provided multiple responses so the totals sum to more than 100%. The most common reason in Winter 2012 for no longer using CFLs was a preference for incandescent light bulbs, mentioned by 22% of the 34 respondents (Table 3-8). Other CFL performance issues mentioned included mercury/disposal issues (a consistent qualm about CFLs raised among Winter 2012 respondents), shorter bulb life than promised, or the bulb not working with particular fixtures. A number of respondents also reported no longer using CFLs for reasons having nothing to do with CFL performance, such as moving (13%) or having bulbs chosen by someone one else (11%) or preferring another efficient light bulb (12%).

### Table 3-8: 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) | Winter 2012 |
|---|---|
| *Sample size* | *34* |
| *Non-Performance or CFL Price Issues* | *36%* |
| Moved/renting and bulbs were already there | 13% |
| Prefer LEDs/other efficient lighting choices | 12% |
| Someone else buys/replaces them | 11% |
| *CFL Performance or Price Issues* | *84%* |
| Went back to/prefer incandescents | 22% |
| Mercury/disposal issues | 12% |
| Shorter bulb life than promised | 11% |
| Did not work with fixtures | 11% |
| Price/expense | 6% |
| Poor light color | 6% |
| Not bright enough | 6% |
| Did not like the look/appearance of CFLs | 4% |
| Did not work well | 3% |
| The long warm up time | 3% |
| Broke too easily | 0% |
| Inadequate for my needs | 0% |
| *Other* | |
| Don’t know/Refused | 10% |

Respondents also self-reported their use of dimmable CFLs. Most Winter 2012 respondents (85%) did not have dimmable CFLs installed, but 13% utilized dimmable CFLs in their homes (Table 3-9). These results are similar to the Winter 2011 and Summer 2012 surveys.

**Table 3-9: Use of Dimmable CFLs in the Home**

(Base: All respondents)

| Dimmable CFLs currently installed | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|
| *Sample size* | *582* | *604* | *600* |
| Yes | 16% | 18% | 13% |
| No | 83% | 82% | 85% |
| Don't know/Refused | 1% | <1% | 1% |

## 3.3 Alternative Lighting Technologies

The Winter 2011 survey established baseline use of the types of screw-in LEDs meant to replace incandescent bulbs. Rates of screw-in LED bulb installation have remained remarkably stable throughout the last 3 survey waves, standing at 16% of homes in all waves (Table 3-10). We anticipate this number increasing in future waves of the consumer survey, as respondents continue to indicate they intend to move toward screw-in LEDs in greater frequency when the price comes down. Note, however, that only seven percent of the households that took part in the onsite visits actually had LEDs installed in them, and this included such types as under cabinet lighting, not just screw-in LEDs. Therefore, it is likely that some telephone survey respondents are confused about whether they have screw-in LEDs installed.

**Table 3-10: LED Screw-In Bulbs Installed in Home**

(Base: All respondents)

| Any LED bulbs currently installed? | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|
| *Sample size* | *582* | *604* | *600* |
| Yes | 16% | 16% | 16% |
| No | 79% | 81% | 81% |
| Don't know/Refused | 5% | 3% | 3% |

The Team also explored LED use by CFL expertise to discern whether those respondents using a large number of CFLs might have also adopted the LED as a popular lighting option. However, as shown in Table 3-11, CFL experts were no more likely to indicate having LEDs installed than were CFL novices, and were actually more likely to indicate not using LEDs, although this finding is driven more by the large number of "don't know" responses among novices than by differences in use.

### Table 3-11: LED Screw-In Bulbs Installed in Home by CFL Expertise

(Base: All respondents)

| Any LED bulbs currently installed? | Overall | CFL Expert | CFL Novice |
|---|---|---|---|
| *Sample size* | *600* | *269* | *329* |
| Yes | 16% | 16% | 17% |
| No | 81% | 84% | 78% Ω |
| Don't know/Refused | 3% | <1%* | 5% Ω |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

Respondents who self-reported having screw-in LEDs currently installed also described the types of fixtures they were installed in. The most frequent response in both late (57%) and Summer 2012 (64%) was floor, table, and portable lamps, which would include widely available LED desk and reading lamps (Table 3-12). Ceiling and overhead lighting was mentioned by almost one-half of respondents (46%), which could point to use of flood and spot lights as well as A-line, screw-in LEDs. Outdoor lighting (9%) and nightlights (6%) were the next most frequent responses.[18]

**Table 3-12: 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 | Summer 2012 | Winter 2012 |
|---|---|---|
| *Sample size* | *101* | *92* |
| Floor/table portable lamps | 64% | 57%* |
| Ceiling/Overhead Lighting | 27% | 46%* |
| Outdoor | 8% | 9% |
| Nightlights | 1% | 6% |
| General lighting/wherever I can | 8% | 5% |
| In an appliance | 2% | 4% |
| Ceiling fans with lighting | 6% | 3% |
| Vanity | 1% | 2% |
| Pendant/hanging | 1% | 2% |
| Cabinet fixtures | 0% | 1% |
| Other | 4% | 1% |
| Recessed lighting | 3% | 0% |
| Basement/cellar/utility spaces | 3% | 0% |
| Track lighting | 2% | 0% |
| Chandelier | 1% | 0% |
| Holiday lighting/candle | 0% | 0% |
| Don't know/Refused | 2% | 8% |

* Respondents and interviewers often have a difficult time distinguishing fixture type, which may explain some of the variation between the two survey waves.

[18] The Team asked a similar question in the Winter 2011 survey but responses focused on technical definitions of fixture types, and interviewers unfamiliar with fixture types mislabeled responses.

# 4 Recent Lighting Purchases

The Team fielded the first wave of the consumer survey in Winter 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 about preferences for certain bulb types and likely consumer reactions to the phase-out of most incandescent bulbs. The Summer 2012 (Wave 2) consumer survey completed in June repeated these questions in order to track changes during the first six months of EISA implementation. The Winter 2012 (Wave 3) consumer survey continued asking about 100-Watt incandescent bulbs and introduced questions about 75-Watt bulbs, which began to be phased out in January 2013.[19]

## 4.1 Recent Purchase History of Incandescent Bulbs

In order to assess whether respondents had noticed any changes in the availability of 100-Watt and 75-Watt incandescent bulbs, we asked whether they had looked for either of these bulbs in the past three months. The Winter 2012 sample was also asked about 75-Watt incandescent bulbs in keeping with the January 2013 phase-out of those bulbs. Those who had shopped for 100-Watt incandescent bulbs in any of the survey waves and those who had shopped for 75-Watt incandescent bulbs in Winter 2012 were then asked a series of questions about their shopping and purchasing experiences.

### 4.1.1 Shopping for 100 and 75-Watt Incandescent Bulbs

Only 9% of Winter 2012 respondents indicated that they had shopped for 100-Watt incandescent bulbs in the past three months (Table 4-1), a significant decrease from both Winter 2011 and Summer 2012 (14% each). However, since only 23% of the Winter 2012 households recalled using 100-Watt incandescent bulbs, the small percentage shopping for them in the past three months is not surprising (see Table 3-1 above). Fourteen percent of Winter 2012 respondents recalled shopping for 75-Watt incandescents.

**Table 4-1: Whether Respondents Had Looked for 100/75-Watt Incandescents in the Past Three Months**

(Base: All respondents)

| Looked for 100/75-Watt incandescent bulbs in past 3 months | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) |
|---|---|---|---|---|
| *Sample size* | *582* | *604* | *600* | *600* |
| Yes | 14% | 14% | 9%*α | 14% |
| No | 85% | 86% | 91% | 85% |
| Don't know/Refused | 1% | <1% | 1% | 1% |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 at the 90% confidence level.

[19] We report results for both 100-Watt and 75-Watt incandescents for late-2012.

Those respondents who had looked for 100/75-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 Winter 2011, more than three out of four respondents (77%) who had attempted to purchase these bulbs found them on store shelves, but, in contrast, only 63% of mid- 2012 respondents, and 49% of Winter 2012 respondents shopping for 100-Watt incandescents found them on the shelves in the three months prior to the survey (Table 4-2). Despite the EISA impact, it is worth stressing that one-half of 100-Watt shoppers still found the bulbs on store shelves in late 2012, indicating that it will likely take stores many months to sell out of existing incandescent stock after wattage-specific phase-outs begin.

Two out of three (67%) 75-Watt shoppers were able to find those bulbs on store shelves. We anticipate that future tracking of these indicators will show patterns similar to the 100-Watt bulb for the 75-Watt bulb and for 40-Watt and 60-Watt bulbs post January 2014.

### Table 4-2: Whether Respondents Had Found 100/75-Watt Incandescent Bulbs on Retailers' Shelves in the Past Three Months

(Base: Respondents who said they had looked for 100/75-Watt incandescent in the past three months)

| Response | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) |
|---|---|---|---|---|
| *Sample size* | *84* | *84* | *52* | *82* |
| Yes – went to a store and found them on the shelves | 77% | 63%* | 49%* | 67% |
| No – went to a store and could NOT find them on the shelves | 15% | 28%* | 41%* | 21% |
| Don't know/Refused | 8% | 9% | 10% | 12% |

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

The respondents who did not find 100 or 75-Watt incandescent bulbs on retailer's shelves in their first attempt noted whether they had looked elsewhere for the bulbs. Four Winter 2012 respondents went to another store to find 100-Watt bulbs, and did so successfully, as did three 75-Watt shoppers (Table 4-3). The majority, however, did not go to another store or otherwise try to locate the bulbs further. Note that the table shows the number of respondents due to small sample sizes.

### Table 4-3: Whether Respondents Had Looked Elsewhere for 100/75-Watt Incandescent Bulbs If Not Found at Retailer

(Base: Number of Respondents who had looked for 100/75-Watt incandescent in the past three months but had not found them)

| Looked for 100/75-Watt incandescents elsewhere (unweighted counts) | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) |
|---|---|---|---|---|
| *Sample size* | *14* | *25* | *20* | *16* |
| Yes, went to another store | 2 | 4 | 4 | 3 |
| Yes, went to look on the internet | 0 | 0 | 0 | 0 |
| Yes, both stores and internet | 0 | 0 | 0 | 0 |
| No, did not go to another store or look on the internet | 12 | 21 | 16 | 13 |

### 4.1.2 Types of Bulbs Purchased when Shopping for 100 and 75-Watt Incandescents

Of the respondents who had found 100-Watt incandescent bulbs on store shelves in the past three months, 62% reported purchasing those bulbs, representing a significant increase in the purchase of 100-Watt bulbs from the Summer 2012 sample (Table 4-4). Two important caveats should be taken with this finding, however. First, a much smaller sample size in Winter 2012 than Summer 2012 (27 respondents vs. 61) accentuates the differences. Since 41% of those originally looking for 100-Watt bulbs in Winter 2012 could not find them (a higher percentage than previous waves), those who did find them were likely to buy them. Second, autumn—the three months in question in Winter 2011 and Winter 2012—is often the season during which people are most likely to buy light bulbs, as opposed to the spring period captured in the Summer 2012 survey. Yet, it may also be the case that the Winter 2012 sample was exposed to the "stock up now" campaigns at retailers; these often target incandescents bulbs in general, not just 75-Watt or 100-Watt, but may increase incandescent purchase rates over what they would normally have been (see Figure 4-1). Of the respondents who had found 75-Watt incandescent bulbs on store shelves in the past three months, 63% reported purchasing those bulbs.

**Table 4-4: 100/75-Watt Incandescent Bulbs Purchased in Past Three Months**

(Base: Respondents who said they had found 100/75-Watt incandescent in a retail store or elsewhere)

| Purchased 100/75-Watt incandescents in past 3 months? | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) |
|---|---|---|---|---|
| *Sample size* | *71* | *61* | *27* | *57* |
| Yes | 56% | 39%* | 62%α | 63% |
| No | 43% | 60%* | 39%α | 37% |
| Don't know/Refused | 2% | 1% | 0% | 0% |

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

α Significantly different from Summer 2012 at the 90% confidence level.

### Figure 4-1: "Stock-up Now!" Display at Partner Retailer*

* This display was nestled on the shelves among a much larger array of alternative bulb types, including CFLs, LEDs, and halogens. Yet, the point remains that program partners still find it necessary to promote stockpiling of incandescent bulbs even as they offer numerous efficient alternatives to those bulbs.

The respondents who had shopped for 100 or 75-Watt bulbs in Winter 2012 but were unable to find them on store shelves also reported whether they had purchased other light bulbs instead of the 100- or 75-Watt incandescents in the past three months. Twenty-one of the 100-Watt shoppers (78%) and 18 of the 75-Watt shoppers (67%) indicated that they had purchased a different type of light bulb (Table 4-5). These high percentages may reflect an understanding on part of the purchasers that incandescents would be increasingly difficult to find moving forward.

### Table 4-5: Whether Purchased Light Bulbs Instead of 100/75-Watt Incandescent in Past Three Months*

(Base: Respondents who said they could not find 100/75 Watt incandescents in a retail store or elsewhere)

| **Purchased instead of 100/75 Watt incandescent in past 3 months (% and unweighted counts)** | **Late 2011** | **Mid 2012** | **Late 2012 (100W)** | **Late 2012 (75W)** |
|---|---|---|---|---|
| *Sample size* | *22* | *31* | *27* | *27* |
| Yes | 55% (12) | 58% (18) | 78% (21) | 67% (18) |
| No | 41% (9) | 42% (13) | 22% (6) | 33% (9) |
| Don't know/Refused | 5% (1) | - | - | - |

* Number of responses in parentheses

The Winter 2012 respondents who bought different types of light bulbs most often chose an incandescent bulb of another wattage (71% instead of 100-Watt and 78% instead of 75-Watt) (Table 4-6). The next most popular choice was a CFL, chosen by 24% of shoppers instead of the 100-Watt incandescent and 44% instead of the 75-Watt. It is possible that the different proclivity by wattage to buy a CFL instead of an incandescent reflects concerns about "brightness." Some consumers persist in their belief that CFLs are not as bright as incandescent bulbs, and people typically use 100-Watt bulbs where they want a bright bulb. This is not as true of 75-Watt bulbs, so consumers may be willing to accept CFLs more for those applications. Although the CFL was the most popular alternative choice in Winter 2011, the small sample sizes across all waves do not allow us to draw any statistically significant conclusions about changes in this purchase behavior from the Winter 2011 baseline. Note that the totals sum to more than the sample size because some respondents purchased more than one type of bulb instead of a 100 or 75-Watt incandescent.

### Table 4-6: Type of Bulb Purchased Instead of 100/75-Watt Incandescent

(Base: Respondents who said they had purchased a bulb instead of a 100/75-Watt incandescent in the past three months)

| Type of Bulb (Multiple Response, % and unweighted counts) | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) |
|---|---|---|---|---|
| *Sample size* | *12* | *18* | *21* | *18* |
| Incandescent bulbs of another wattage | 67% (8) | 56% (10) | 71% (15) | 78% (14) |
| CFLs | 75% (9) | 39% (7) | 24% (5) | 44% (8) |
| Halogen bulbs | 33% (4) | 11% (2) | 10% (2) | 0% |
| LEDs | 8% (1) | 6% (1) | 0% | 0% |
| Night Light, spotlights | 17% (2) | 0% | 0% | 0% |
| Fluorescent tube | 0% | 0% | 0% | 0% |
| Candelabra | 0% | 0% | 4% (1) | 0% |
| Floodlight | 0% | 0% | 0% | 0% |
| Christmas lights | 0% | 0% | 0% | 0% |
| Appliance bulb | 0% | 0% | 0% | 0% |
| Don't know/Refused | 0% | 6% (1) | 0% | 0% |

* Number of responses in parentheses

The respondents in Winter 2012 who reported purchasing an incandescent bulb of another wattage also reported which wattage bulb they chose. For both 100-Watt incandescents and 75-Watt incandescents the most popular wattage to purchase instead was the incandescent one wattage bin lower (i.e., a 75-Watt instead of a 100-Watt, and a 60 Watt instead of a 75-Watt) (Table 4-7). Few respondents bin-jumped to a higher wattage than the bulb they were shopping for. Only one respondent purchased a 150 Watt bulb instead of a 100-Watt, and no respondents purchased a higher wattage than a 75 when shopping for that bulb.

**Table 4-7: Wattage of Incandescent Bulb Bought Instead of 100/75-Watt Incandescent**

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

| Wattage (Multiple Response, % and unweighted counts) | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75 W) |
|---|---|---|---|---|
| *Sample size* | *8* | *10* | *15* | *14* |
| 75-Watt | 50% (4) | 20% (2) | 40% (6) | - |
| 60-Watt | 38% (3) | 20% (2) | 33% (5) | 79% (11) |
| 40-Watt | 25% (2) | 10% (1) | 0% | 7% (1) |
| 25-Watt | 13% (1) | 0% | 0% | 7% (1) |
| 150-Watt | 13% (1) | 0% | 7% (1) | 0% |
| 3-way | 13% (1) | 50% (5) | 0% | 0% |
| 90-Watt | 0% | 0% | 20% (3) | 0% |
| 50-Watt | 0% | 0% | 0% | 7% (1) |
| Don't know/Refused | 0% | 0% | 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 and 75-Watt incandescents. Including the bulb purchase behavior of the respondents discussed above who had at least shopped for 100 or 75-Watt incandescent bulbs, we find that 44% of the Winter 2012 sample purchased some type of light bulb in the past three months, a comparable amount to both the Summer 2012 and Winter 2011 samples (Table 4-8).

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

(Base: All respondents)

| Purchased a bulb in past 3 months? | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|
| *Sample size* | *582* | *604* | *600* |
| Yes | 47% | 42%* | 44% |
| No | 53% | 58%* | 55% |
| Don't know/Refused | <1% | 1% | 1% |

* Significantly different from Winter 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. For Winter 2012 respondents, the most purchased bulb differed depending on whether the whole sample was taken into consideration or only aware purchasers. For aware purchasers, CFLs were the most popular choice (49%) followed by incandescents (47%). Across the entire sample, however, the trend switched, with 24% of all respondents reporting incandescent purchases, and 20% reporting CFLs. The influence of EISA is certainly noteworthy in the most recent wave of the survey, with the percentage of aware respondents purchasing incandescents showing a significant decline from both Winter 2011 and Summer 2012 (when incandescent purchases were at 57% and 58% respectively). Compared with the Winter 2011 and Summer 2012 results, the percentage of Winter 2012 purchases of both screw-in and pin-based LEDs also showed significant increases. As LED prices continue to fall—including as a result of the PAs' programs—we expect to see even greater numbers of purchases for these bulbs. Finally, it is worth noting that halogen bulbs do not seem to be a popular bulb choice at this time, although the PAs should continue to track this indicator as EISA implementation—particularly of the popular 60-Watt incandescent—continues. Other bulbs mentioned in Winter 2012 included flood lights and specialty bulbs including globes and candelabras.

## 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; 600) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| CFLs that screw into regular light sockets | 250 | 196 | 184 | 65% | 49%* | 49%* | 24% | 15%* | 20%*α |
| Incandescent or regular light bulbs | 359 | 238 | 197 | 57% | 58% | 47%*α | 25% | 23% | 24% |
| Halogen bulbs that screw into regular light sockets | 236 | 200 | 181 | 26% | 18%* | 15%* | 9% | 6%* | 6%* |
| Pin-based fluorescent tubes that can only be used in fluorescent light fixtures | 300 | 269 | 269 | 16% | 17% | 16% | 8% | 7% | 7% |
| LEDs that screw into regular light sockets | 164 | 134 | 135 | 18% | 13% | 24%*α | 4% | 3% | 5%α |
| Pin-based CFLs that can only be used in special light fixtures[Ω] | 300 | 203 | 203 | 10% | 8% | 6%* | 5% | 3%* | 2%* |
| Pin-based LEDs that can only be used in special light fixtures[Ω] | 300 | 137 | 140 | 5% | 3% | 14%*α | 2% | 1% | 3%α |
| **Other bulbs mentioned** | | | | | | | | | |
| Pin-based Halogens | 2 | 5 | 2 | | | | | | |
| Flood lights | 5 | 7 | 6 | N/A** | - | - | N/A** | - | - |
| Strip or under cabinet LED | 2 | 1 | 1 | | | | | | |
| Holiday/string lighting | 2 | 1 | 3 | | | | | | |
| Automotive bulbs/headlights | 3 | 4 | 1 | | | | | | |
| Bulb for recessed lighting | 3 | 2 | 1 | | | | | | |
| High pressure sodium lights | 1 | 0 | 1 | | | | | | |
| Globe/candelabra/specialty | 0 | 0 | 8 | | | | | | |
| Other | 4 | 10 | 12 | | | | | | |

* Significantly different from Winter 2011 at the 90% confidence level. α Significantly different from Summer 2012 at the 90% confidence level.

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

Ω 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" or "75-Watt" bulbs and their equivalents, consumers will instead be presented with labels and educational materials that reference lumens, color temperature, annual operating costs, and 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 Winter 2012 was the wattage of the bulb (52%), which was also mentioned by 41% of respondents in the prompted follow-up (Table 5-1 on the next page). Following the Winter 2011 and Summer 2012 pattern of responses, in Winter 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 continue to 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 (24% and 63%, respectively) and the bulb life (15% and 45%, respectively). Encouragingly from both an educational and energy efficiency perspective, the Winter 2012 sample showed significant increases in unprompted responding of the ENERGY STAR label and color appearance/color temperature.

## 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 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| *Sample Size* | *582* | *604* | *600* | *582* | *604* | *600* | *582* | *604* | *600* |
| Wattage | 50% | 54% | 52% | 44% | 42% | 41% | 94% | 96% | 93% |
| Price | 25% | 26% | 24% | 66% | 66% | 63% | 91% | 92% | 87%*α |
| Watt equivalency | 5% | 9%* | 12%*α | 69% | 61%* | 55%*α | 74% | 70% | 67%* |
| Bulb life | 14% | 13% | 15% | 47% | 51% | 45% | 61% | 64% | 60% |
| Shape | 3% | 5%* | 7%* | 56% | 59% | 50%*α | 59% | 64%* | 57%α |
| ENERGY STAR label | 9% | 6%* | 10%α | 55% | 55% | 46%*α | 64% | 61% | 56%*α |
| Color appearance, color temperature, Kelvin | 6% | 9%* | 12%*α | 49% | 45% | 40%*α | 55% | 54% | 52% |
| 3-way | 1% | 1% | 1% | 39% | 44%* | 37% | 40% | 45%* | 38%α |
| Lumens, brightness, light output | 10% | 11% | 11% | 20% | 19% | 21% | 30% | 30% | 32% |
| Dimming | 1% | <1% | 1% | 25% | 26% | 22% | 26% | 26% | 23% |
| UL, or Underwriters Laboratories label | <1% | <1% | <1% | 21% | 25% | 23% | 21% | 25% | 23% |
| Lighting facts/energy facts label | 3% | 4% | 2%α | 20% | 17% | 17% | 23% | 21% | 19% |
| CRI, or color rendition index | 1% | 1% | 1% | 12% | 12% | 12% | 13% | 13% | 13% |
| Mercury content | <1% | 1% | 1% | 13% | 12% | 15% | 13% | 13% | 16% |
| Energy usage/energy efficiency | 10% | 7%* | 6%* | N/A | N/A | N/A | 10% | 7%* | 6%* |
| Bulb size, base size | 5% | 6% | 7% | N/A | N/A | N/A | 5% | 6% | 7% |
| Brand/Manufacturer | 3% | 5%* | 6%* | N/A | N/A | N/A | 3% | 5% | 6%* |
| Matches bulb being replaced, appropriate for my needs | 3% | 4% | 4% | N/A | N/A | N/A | 3% | 4% | 4% |
| Type of bulb (CFL/LED/Non-incandescent) | 4% | 3% | 2%* | N/A | N/A | N/A | 4% | 3% | 2% |
| Where made/Made in USA | 1% | 1% | 2% | N/A | N/A | N/A | 1% | 1% | 2% |
| Environmentally friendly | 1% | 1% | 1% | N/A | N/A | N/A | 1% | 1% | 1% |
| Packaging | 0% | 0% | 1% | N/A | N/A | N/A | 0% | 0% | 1% |
| Nothing | 1% | 4%* | 0%α | N/A | N/A | N/A | 1% | 4%* | 0%α |

| Information on packaging (Multiple Response) | Unprompted Response | | | Prompted Response | | | Total Prompted and Unprompted | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| Savings on energy bill | <1% | 2% | 1% | N/A | N/A | N/A | <1% | 2% | 1% |
| Incandescent only | <1% | <1% | 1% | N/A | N/A | N/A | <1% | <1% | 1% |
| Don't know/Refused | 7% | 4%* | 9%α | N/A | N/A | N/A | 7% | 4% | 9%α |
| Other | 4% | 3% | 3% | N/A | N/A | N/A | 4% | 3% | 3% |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 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 Winter 2012 respondents (72%) indicated that they had seen or heard the terms "warm white" and "cool white," a significant increase over Winter 2011 and Summer 2012. Further 59% had seen or heard of the term "lumens," a comparable amount to Summer 2012 (55%) but a significant increase over Winter 2011 (53%) (Table 5-2). These results provide evidence that PA's and educational campaigns geared at increasing consumer awareness of lighting terms are working.

**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" | | |
|---|---|---|---|---|---|---|
| | **Winter 2011** | **Summer 2012** | **Winter 2012** | **Winter 2011** | **Summer 2012** | **Winter 2012** |
| *Sample size* | *582* | *604* | *600* | *582* | *604* | *600* |
| Yes | 53% | 55% | 59%* | 64% | 67% | 72%*α |
| No | 46% | 45% | 40%*α | 35% | 33% | 28%*α |
| Don't know/Refused | 1% | - | 1% | 1% | 1% | <1% |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 at the 90% confidence level.

Differences in respondent knowledge of key lighting terms were also heavily influenced by CFL use. Compared to the 72% of respondents who had heard the terms "warm white" and "cool white" overall, CFL experts had an 87% awareness rate of the terms, but only 60% of CFL novices had heard of them (Table 5-3). Similarly, while awareness of "lumens" was 59% for the entire sample, 77% of CFL experts had heard the term, while only 46% of CFL novices had. All of the differences in awareness of these key terms were statistically significant. Along with judgments about relative energy use and knowledge of changes to the lighting market, familiarity with key lighting terms also appears to be highly influenced by respondent CFL use. Differences in educational attainment, however, might explain at least some of this variation in awareness of lighting terminology. When looking at differences in social attributes between CFL novices and experts (see Section 8.2), we did note higher levels of education among experts.

**Table 5-3: Whether Respondents Had Seen or Heard the Term "Lumens", "Warm White" and "Cool White" by CFL Expertise**

(Base: All Respondents)

| | Have Heard of Lumens | | | Have Heard "Warm White" and "Cool White" | | |
|---|---|---|---|---|---|---|
| | **Overall** | **CFL Expert** | **CFL Novice** | **Overall** | **CFL Expert** | **CFL Novice** |
| *Sample size* | *600* | *269* | *329* | *600* | *269* | *329* |
| Yes | 59% | 77%* | 46%*Ω | 72% | 87%* | 60%*Ω |
| No | 40% | 24%* | 53%*Ω | 28% | 13%* | 39%*Ω |
| Don't know/Refused | 1% | 0% | 1% | <1% | 0% | 1% |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

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 5-4 shows that the majority of respondents familiar with the term lumens (76% of those asked or 48% of all 600 respondents in Winter 2012) correctly understood that the term refers to light output or brightness, and, again, the responses are very similar across the three waves.

### Table 5-4: Understanding of the Term "Lumens"

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

| Respondents' understanding of "lumens" (Multiple Response) | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|
| *Sample size* | *370* | *370* | *376* |
| Light output or brightness | 74% | 74% | 76% |
| Unit of measure of lighting | 2% | 1% | 1% |
| Distance light will penetrate | 2% | 1% | 1% |
| Candlelight | 2% | 3% | 3% |
| Light color | 1% | 1% | <1% |
| The same as Watts | 1% | 3% | 3% |
| Quality of light | 1% | 1% | 1% |
| Energy emitted | 1% | 1% | 1% |
| Efficiency | <1% | <1% | 1% |
| Company or brand | - | 2% | <1% |
| Other | 3% | 2% | 2% |
| Don't know/Refused | 16% | 16% | 14% |

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 (80% of those asked or 60% of all 600 respondents), noting that it referred to the color appearance of the light (Table 5-5). Despite the high levels of familiarity with the terms, the Winter 2012 sample (as with the Summer 2012) actually displayed lower familiarity than the Winter 2011 sample, in which almost every respondent correctly identified "warm white and cool white." A greater number of both 2012 samples 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," suggesting an opportunity for the PAs' to help clarify the differences in these concepts as part of their educational campaigns.

**Table 5-5: 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)** | **Winter 2011** | **Summer 2012** | **Winter 2012** |
|---|---|---|---|
| *Sample size* | *426* | *434* | *451* |
| Color appearance | 92% | 83%* | 80%* |
| Heat of the bulb | 5% | 5% | 4% |
| Fluorescent/one resembles fluorescent light | 3% | 2% | 3% |
| Relates to your eyes/how your eyes perceive the light | 1% | 7%* | 10%* |
| Wavelength spectrum of the light | 1% | 3% | 3% |
| Coated vs. clear bulb | 1% | 2% | 4% |
| The way you look in the bulbs light | <1% | <1% | 1% |
| Other | 4% | 3% | 6% |
| Don't know/Refused | 14% | 15% | 11% |

* Significantly different from Winter 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 were no longer available (in Winter 2011 and Summer 2012) and after 75-Watt incandescent bulbs are no longer available in Winter 2012. As previously mentioned, the three-wave survey effort assesses respondent behavior as the various phases of EISA are employed. As respondents in Winter 2012 were asked about replacing a different bulb than those in Winter 2011 and Summer 2012 (a 75-Watt vs. 100-Watt incandescent), the bulb replacement choices also differed. For example, instead of being given a 23-Watt CFL meant to replace a 100-Watt incandescent as an option, Winter 2012 respondents were given an 18-Watt CFL meant to replace a 75-Watt incandescent as an option. In other words, the bulb types have not changed, only their respective wattages and the bulbs they are meant to replace. We have made these choices clear throughout the tables and discussion in this section. 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 different from those reported here.

## 6.1 Bulb Choice under EISA

In Winter 2012, the most popular option to replace a 75-Watt incandescent was an 18-Watt CFL (35%) (Table 6-1). This stands in contrast to responses in the two earlier waves about replacement of 100-Watt incandescents when the most common response was a lower-wattage incandescent (34% in Winter 2011 and 41% in Summer 2012); instead, roughly one in four respondents (23%) in Winter 2012 indicated they would choose a lower wattage incandescent. Approximately one in ten respondents in Winter 2012 would choose a 53-Watt screw-in halogen, a 16- to 18-Watt screw-in LED, or a higher wattage incandescent bulb to replace a 75-Watt incandescent. A higher percentage of respondents in Winter 2012 chose the higher wattage incandescent than the previous waves, but this may reflect differences in the bulb being compared.

**Table 6-1: Bulb Choice under EISA**

(Base: All Respondents)

| Bulb type | Winter 2011 (100W) | Summer 2012 (100W) | Winter 2012 (75W)** |
|---|---|---|---|
| *Sample size* | *582* | *604* | *600* |
| A lower wattage incandescent bulb | 34% | 41%* | 23% |
| A 23/18-Watt screw-in CFL bulb meant to replace a 100/75-Watt incandescent bulb | 30% | 27% | 35% |
| A 72/53-Watt screw-in halogen bulb meant to replace a 100/75-Watt incandescent bulb | 13% | 11% | 9% |
| A 17/16-18-Watt screw-in LED bulb meant to replace a 100/75-Watt incandescent bulb | 10% | 10% | 10% |
| A 150/Higher Watt incandescent bulb | 4% | 4% | 11% |
| Don't know/refused | 9% | 8% | 14% |

* Significantly different from Winter 2011 at the 90% confidence level.
** Statistical comparisons not run between different bulb types.

Interesting differences emerged in bulb preferences when the Winter 2012 sample was broken down by CFL expertise. While the 18-Watt CFL was the most popular option across the entire Winter 2012 sample, chosen by 35% of respondents, the number almost doubled to 64% among CFL experts (Table 6-2). Further, the 23% overall who chose a lower wattage incandescent bulb dropped to only eight percent among CFL experts. Both differences were significant. The opposite trend emerged for CFL novices, with a significantly larger percentage than either overall or experts choosing lower wattage incandescents (34%) or higher wattage incandescents (17%) and significantly smaller percentage than overall choosing the 18-Watt CFL (12%). Also of note were significant differences from the overall sample (11%) in the percentage of experts (3%) and novices (17%) choosing the higher wattage incandescent. Novices (7%) were also significantly less likely than experts (13%) to choose the LED as a replacement. These very pronounced and noteworthy changes highlight the important influence that CFL expertise can have on one's preferred bulb types.

**Table 6-2: Bulb Choice to Replace 75-Watt Incandescent under EISA by CFL Expertise**

(Base: All Respondents)

| Bulb type | Overall | CFL Expert | CFL Novice |
|---|---|---|---|
| *Sample size* | *600* | *269* | *329* |
| A lower wattage incandescent bulb | 23% | 8%* | 34%*Ω |
| An 18-Watt screw-in CFL bulb meant to replace a 75-Watt incandescent bulb | 35% | 64%* | 12%*Ω |
| A 53-Watt screw-in halogen bulb meant to replace a 75-Watt incandescent bulb | 9% | 6% | 11%Ω |
| A 16-18-Watt screw-in LED bulb meant to replace a 75-Watt incandescent bulb | 10% | 13% | 7%Ω |
| A Higher Watt incandescent bulb | 11% | 3%* | 17%*Ω |
| Don't know/refused | 14% | 6%* | 19%*Ω |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert 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.[20] Popular reasons for respondents choosing the most energy efficient bulbs (i.e., the 18-Watt CFL or the 16- to 18-Watt LED) were the fact that they use less energy and are efficient (44% for the CFL and 53% for the LED) and a preference for the particular bulb's light/color temperature/brightness (24% for the CFL and 34% for the LED) (Table 6-3). Respondents also noted the low price of CFLs or the fact that they were on sale (21%), and the long bulb life of the LED (18%). Preferences for the less efficient bulb types (i.e., a higher or lower wattage incandescent or a 53-Watt halogen) were more varied. By far the most popular reason for choosing a higher wattage incandescent was a preference for the bulb's light/color temperature/brightness, cited by 84% of those choosing that bulb (Table 6-4). For both the lower wattage incandescent and the halogen, respondents noted familiarity with the bulbs (24% and 23%, respectively), and that they use less energy (25% and 18%, respectively). A positive aspect for those choosing the lower wattage incandescent was also lower energy bills (18%). Interestingly, respondents choosing the halogen were similar to those choosing the CFL when citing the importance of the bulb being on sale (14% for halogen), which suggests that the PAs' efforts to keep CFL prices down are still necessary to compete with the less efficient halogen.

[20] These tables include a great deal of information, capturing reasons for bulb choices across bulb types and for 100-Watt and 75-Watt incandescent bulbs in different survey waves. To ease discussion, we have focused on the late-2012 results pertaining to chosen replacement for a 75-Watt incandescent. More detail on the first two surveys waves can be found in NMR. 2012. *Massachusetts Consumer Survey Results 2012*. Final delivered October 23.

## Table 6-3: Reasons for Bulb Choice under EISA - CFL and LED

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

| Reasons (Multiple Response) | 23/18 Watt CFL | | | 17/16-18 Watt LED | | |
|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| *Sample size* | *190* | *190* | *216* | *56* | *65* | *60* |
| Prefer this light/color temperature/brightness | 12% | 19%* | 24%* | 34% | 18%* | 34%α |
| Uses less energy/efficient | 49% | 38%* | 44% | 44% | 29%* | 53%α |
| Familiar with/already use this bulb | 17% | 10%* | 21%α | 17% | 12% | 8% |
| Fit fixtures/recommended for fixture | 4% | 4% | 2% | 0% | 5% | 3% |
| Low price/on sale | 7% | 9% | 21%*α | 5% | 2% | 5% |
| Lower energy bills | 7% | 10% | 16%*α | 10% | 12% | 11% |
| Warm up quicker | <1% | 1% | 1% | 2% | 3% | 5% |
| Don't like CFLs because of mercury | 1% | 1% | <1% | 5% | 3% | 4% |
| Convenience/availability/easy to use | 5% | 3% | 5% | 0% | 2% | 3% |
| Most similar to incandescent I used/use | 8% | 1% | 7%α | 9% | 3% | 2% |
| Exchanging incandescents to other bulbs as needed | 1% | 3% | 1% | 2% | 0% | 0% |
| Lasts longer | 12% | 5%* | 8% | 9% | 25%* | 18% |
| Good quality bulb/trustworthy | 1% | 2% | 1% | 0% | 5% | 2% |
| Not as hot | 3% | 4% | 4% | 5% | 3% | 6% |
| Because of EISA/following the market | 2% | 1% | 2% | 2% | 0% | 2% |
| Don't like the government telling me what bulb to use | 0% | 0% | 0% | 2% | 0% | 0% |
| Environmentally friendlier | 2% | 1% | 4%α | 2% | 3% | 2% |
| Other | 3% | 4% | 1% | 3% | 2% | 3% |
| Don't know/refused | 4% | 4% | 3% | 4% | 2% | 5% |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 at the 90% confidence level.

## Table 6-4: Reasons for Bulb Choice under EISA – Incandescent and Halogen

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

| Reasons (Multiple Response) | Lower wattage incandescent | | | 72/53 Watt Halogen | | | 150/Higher Watt Incandescent | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| *Sample size* | *191* | *204* | *133* | *58* | *66* | *48* | *23* | *25* | *63* |
| Prefer this light/color temperature/brightness | 33% | 34% | 19%*α | 35% | 30% | 15%*α | 65% | 68% | 84%* |
| Uses less energy/efficient | 20% | 21% | 25% | 10% | 26%* | 18% | 6% | 4% | 2% |
| Familiar with/already use this bulb | 13% | 28%* | 24%* | 8% | 12% | 23%* | 7% | 8% | 8% |
| Fit fixtures/recommended for fixture | 8% | 18%* | 6%α | 6% | 3% | 2% | 0% | 4% | 1% |
| Low price/on sale | 9% | 7% | 11% | 4% | 2% | 14%*α | 6% | 0% | 2% |
| Lower energy bills | 8% | 5% | 18%*α | 17% | 2%* | 8% | 0% | 0% | 0% |
| Warm up quicker | 2% | 1% | 1% | 1% | 2% | 4% | 6% | 0% | 2% |
| Don't like CFLs because of mercury | 2% | 1% | 5%α | 1% | 2% | 0% | 3% | 4% | 4% |
| Convenience/availability/easy to use | 3% | 2% | 6%α | 3% | 3% | 2% | 0% | 0% | 0% |
| Most similar to incandescent I used/use | 1% | 1% | 0% | 13% | 6% | 15% | 0% | 0% | 2% |
| Exchanging incandescents to other bulbs as needed | 2% | 1% | 0%* | 0% | 0% | 1% | 0% | 0% | 2% |
| Lasts longer | 1% | <1% | 0% | 3% | 2% | 8% | 9% | 0% | 2% |
| Good quality bulb/trustworthy | 1% | <1% | 2% | 1% | 2% | 0% | 3% | 4% | 2% |
| Not as hot | 1% | 5%* | 2% | 1% | 3% | 0% | 0% | 0% | 0% |
| Because of EISA/following the market | 1% | 5% | 0%α | 0% | 0% | 0% | 0% | 0% | 0% |
| Don't like the government telling me what bulb to use | 1% | 0% | 0% | 0% | 2% | 2% | 0% | 0% | 0% |
| Environmentally friendlier | <1% | <1% | 1% | 0% | 0% | 1% | 0% | 0% | 0% |
| Other | 8% | 5% | 3% | 3% | 3% | 0% | 5% | 0% | 3% |
| Don't know/refused | 7% | 3% | 8%α | 8% | 14% | 14% | 9% | 0% | 3% |

* Significantly different from Winter 2011 at the 90% confidence level.
α Significantly different from Summer 2012 at the 90% confidence level.

## 6.2 Stockpiling of Incandescents

The EISA legislation has raised concerns about "stockpiling" or "hoarding" incandescent bulbs, and NMR has been documenting evidence regarding stockpiling behaviors in previous deliverables.[21] Given these concerns about stockpiling, the Team continued to track self-reported stockpiling behavior in the Winter 2012 survey.

As in Winter 2011 and Summer 2012, the Winter 2012 respondents indicated their likelihood of stockpiling, but for 75-Watt incandescents instead of 100-Watt. Across the full sample, the majority of Winter 2012 respondents indicated that they would be very unlikely to buy and save extra 75-Watt incandescent bulbs (64%), while a smaller percentage indicated being very likely to do so (9%), somewhat likely to do so (11%), and somewhat unlikely to do so (13%) (Table 6-5). The average value on the four-point likelihood scale was 3.4. These percentages were comparable to previous waves, even though they asked about a different wattage bulb. 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 were more likely to say they would stockpile bulbs (12%) than those who only found out about EISA during the survey (7%). Additionally, those unfamiliar with EISA indicated they are very unlikely to stockpile at a significantly higher rate than those aware of the EISA legislation (67% versus 60%, respectively). As suggested in previous waves, these findings indicate that the PAs will likely want to continue their efforts at targeting those consumers who are just learning about EISA focusing on the message that the most efficient lighting options are viable, even superior, options to incandescents.

[21] NMR. *Results of the Massachusetts and South Dakota* 2011. NMR. 2012. *Massachusetts Consumer Survey Results 2012.* NMR. 2012. *Results of the Massachusetts Onsite Compact Fluorescent Lamp Surveys*. Final delivered October 23.

## Table 6-5: Likelihood of Buying and Saving Extra 100/75-Watt Incandescent Bulbs for Use After 2012/2013

(Base: All Respondents)

| Level of likelihood | Overall | | | Aware of EISA | | | Not Aware of EISA | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Winter 2011* | *Summer 2012* | *Winter 2012 (75W)* | *Winter 2011* | *Summer 2012* | *Winter 2012 (75W)* | *Winter 2011* | *Summer 2012* | *Winter 2012 (75W)* |
| *Sample size* | *582* | *604* | *600* | *327* | *292* | *277* | *255* | *312* | *321* |
| Mean | 3.3 | 3.2 | 3.4 | 3.1 | 3.1 | 3.2 | 3.4[*Ω] | 3.3 | 3.5[Ω] |
| 1. Very likely | 11% | 12% | 9% | 17%[*] | 17%[*] | 12% | 6%[*Ω] | 9%[Ω] | 7%[Ω] |
| 2. Somewhat likely | 11% | 12% | 11% | 12% | 13% | 13% | 11% | 12% | 10% |
| 3. Somewhat unlikely | 16% | 9% | 13% | 12% | 9% | 14% | 20% | 9%[€] | 12% |
| 4. Very unlikely | 59% | 66%[€] | 64% | 60% | 61% | 60% | 63% | 70 %[Ω€] | 67%[Ω] |
| Don't know/refused | 3% | 1% | 3% | 0% | <1% | 1% | 1% | 1% | 5%[Ω] |

[*] Significantly different from Overall at the 90% confidence level.
[€] Significantly different from Winter 2011 at the 90% confidence level.
[Ω] Significantly different from 'Aware of EISA' at the 90% confidence level.

Along with EISA awareness, level of CFL expertise also had a significant influence on likelihood of hoarding. Across all levels of likelihood, CFL experts showed lower proclivity to hoard incandescents, an expected but still encouraging finding given their preference for CFLs. Approximately three out of four CFL experts (76%) indicated being very unlikely to hoard 75-Watt incandescents; a significantly higher percentage than CFL novices (55%) (Table 6-6). Further, only 5% of CFL experts indicated being very likely to hoard compared to 12% of novices, also a significant difference. The mean level of hoarding likelihood for CFL experts (3.6 out of 4) was also indicative of significantly lower levels of potential hoarding than that of CFL novices (3.2 out of 4).

**Table 6-6: Likelihood of Buying and Saving Extra 75-Watt Incandescent Bulbs for Use After 2013 by CFL Expertise**

| **Level of Likelihood** | **CFL Expert vs. Novice** | | |
|---|---|---|---|
| | *Overall* | *CFL Expert* | *CFL Novice* |
| *Sample size* | *600* | *269* | *329* |
| Mean | 3.4 | 3.6 | 3.2 $^{\Omega}$ |
| 1. Very likely | 9% | 5% $^{*}$ | 12% $^{\Omega}$ |
| 2. Somewhat likely | 11% | 6% $^{*}$ | 15% $^{*\Omega}$ |
| 3. Somewhat unlikely | 13% | 12% | 14% |
| 4. Very unlikely | 64% | 76% $^{*}$ | 55% $^{*\Omega}$ |

$^{*}$ Significantly different from overall at the 90% confidence level.
$^{\Omega}$ Significantly different from CFL Expert at the 90% confidence level

The timing of the Winter 2012 survey also gave us the opportunity to analyze not only potential hoarding of 75-Watt incandescent bulbs, but also self-reported hoarding of 100-Watt incandescent bulbs since the first phase of EISA had been underway for year. In fact, only 9% of the overall sample had indicated stockpiling 100-Watt incandescents in 2012 (Table 6-7). This is comparable to the percentage of respondents from the Winter 2011 and Summer 2012 surveys who said they were "very likely" to stockpile 100-Watt incandescents (Table 6-5).

**Table 6-7: Actual Stockpiling of 100-Watt Incandescent Bulbs**

(Base: All Respondents)

| Did you Buy Extra 100-Watt Bulbs? | Winter 2012 |
|---|---|
| *Sample size* | *600* |
| Yes | 9% |
| No | 90% |
| Don't know/refused | 1% |

When breaking the Winter 2012 sample down by CFL expertise, important hoarding differences emerged. As expected, CFL novices (12%) were significantly more likely to hoard 100-Watt incandescent bulbs than were CFL experts (6%) (Table 6-8). As discussed in Section 7, having a large number of CFLs currently installed indicates greater satisfaction with CFLs; experts' low rate of stockpiling likely stems from their acceptance of CFLs as a preferred lighting technology.

**Table 6-8: Actual Stockpiling of 100-Watt Incandescent Bulbs by CFL Expertise**

(Base: All Respondents)

| Did you Buy Extra 100-Watt Bulbs? | Overall | CFL Experts | CFL Novices |
|---|---|---|---|
| *Sample size* | *600* | *269* | *329* |
| Yes | 9% | 6% | 12% $^{\Omega}$ |
| No | 90% | 94% $^{*}$ | 87% $^{\Omega}$ |
| Don't know/refused | 1% | 1% | 1% |

$^{*}$ Significantly different from overall at the 90% confidence level.
$^{\Omega}$ Significantly different from CFL Expert at the 90% confidence level.

We also gauged potential stockpiling of incandescent bulbs by asking the number of 100-Watt and 75-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 Winter 2012 respondents was 8.28, and the median value (the number occurring at the midpoint of purchases) was six (Table 6-9). The greatest percentage of respondents (47%) 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, 53% of respondents buying 100-Watt incandescents reported buying six or more bulbs. Among 75-Watt purchasers, the average number of bulbs purchased was 7.34, and the median value was also six (Table 6-9). One to five bulbs was also the quantity reported by the largest percentage of purchasers (50%). Expanding the analysis to all respondents—most of whom did not buy 100 or 75-Watt incandescents—places the findings in a broader context, indicating fairly low rates of stockpiling across the broader population. Only 3% of the entire sample purchased 100-Watt incandescents, with a mean purchase 0.23 bulbs per participant, and less than 7% purchased 75-Watt incandescent, with a mean purchase of 0.47 bulbs per participant. Compared with the Winter 2011 results, the Winter 2012 respondents purchased fewer 100-Watt bulbs in smaller quantities, and purchased a similar amount to the Summer 2012 sample. Note that the numbers of bulbs purchased shows seasonal variation, with fewer purchases in Summer 2012 than in Winter 2011 or Winter 2012. However, the mean number of 100-Watt bulbs acquired by bulb purchasers was significantly higher in Winter 2011 (12.5) than Winter 2012 (8.28). Since these surveys were conducted at the same time of year the effect is more likely due to the influence of EISA than seasonal variation.

### Table 6-9: Quantity of 100/75-Watt Incandescent Bulbs Purchased

(Base: Respondents who said they had bought 100/75-Watt incandescent bulbs in the past three months)

| Number of bulbs purchased | 100/75-Watt Incandescent Purchasers | | | | All Respondents | | | |
|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) |
| *Sample size* | *47* | *28* | *17* | *39* | *582* | *604* | *600* | *600* |
| Mean | 12.50[a] | 6.04 | 8.28 | 7.34 | 1.10 | 0.23 | 0.23 | 0.47 |
| Median | 6 | 4 | 6 | 6 | 0 | 0 | 0 | 0 |
| **Quantity** | | | | | | | | |
| 1-5 | 40% | 66% | 47% | 50% | 3% | 3% | 1% | 3% |
| 6-10 | 23% | 18% | 33% | 36% | 2% | 1% | 1% | 2% |
| 11-25 | 23% | 10% | 20% | 12% | 2% | <1% | 1% | 1% |
| 25+ | 13% | 3% | 0% | 2% | 1% | <1% | 0% | <1% |
| Don't know | 0% | 3% | 0% | 4% | 0% | <1% | 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, Winter 2012 respondents who had indicated they were likely to stockpile 100-Watt and 75-Watt incandescents also self-reported purchasing more (96 of the 100-Watt and 404 of the 75-Watt bulbs) of those bulbs than the respondents who said they would be unlikely to stockpile (41 and 78 respectively bulbs), a similar pattern to Summer 2012 (Table 6-10). It is worth noting that those likely to stockpile in Winter 2011 purchased significantly more 100-Watt bulbs (549 bulbs) than those likely to stockpile in either of the 2012 waves. Again, since the Winter 2011 and Winter 2012 surveys were fielded during the same time of year (Dec. – Jan.) the large change in the stockpiling of 100-Watt incandescents may very well reflect their limited availability on store shelves. This possible conclusion is further supported by the comparatively larger number of 75-Watt incandescent bulbs bought during the same Winter 2012 time period, which had not been phased out at that time.

**Table 6-10: Total Number of 100/75-Watt Incandescent Bulbs Purchased by Self-Reported Tendency to Stock Pile**

(Base: Respondents who said they had bought 100/75-Watt incandescent bulbs in the past three months)

| Stockpiling likelihood | Likely to stockpile | | | | Unlikely to stockpile | | | |
|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) | Winter 2011 | Summer 2012 | Winter 2012 (100W) | Winter 2012 (75W) |
| *Sample size* | *31* | *17* | *11* | *24* | *16* | *10* | *6* | *14* |
| Number purchased | 549 | 97 | 96 | 404 | 82 | 45 | 41 | 78 |

# 7 CFL Satisfaction

The Team 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. Continuing from the Summer 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.

The survey question about standard CFL satisfaction has been asked since the 2009 consumer survey. In the Winter 2011 report, NMR noted a decrease in the percentage of households very satisfied and satisfied with CFLs. The Summer 2012 results saw an increase over the relatively low levels of satisfaction in Winter 2011, with the majority of respondents in that wave (76%) indicating that they were somewhat to very satisfied with CFLs (Table 7-1), a 3% increase over the Winter 2011 survey. Respondents to the Winter 2012 survey evinced similar levels of satisfaction to Summer 2012, with 77% of CFL users being somewhat or very satisfied with the bulbs. Further, in the current sample and the Summer 2012 sample, a greater percentage of respondents (45% each) indicated they were very satisfied with standard CFLs compared to the Winter 2011 sample (35%). Yet, satisfaction in the two 2012 surveys was still significantly lower than in 2009. The variation in this indicator suggests that the PAs should continue to track it frequently and in a similar manners in future evaluation activities.

**Table 7-1: 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 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample size* | *339* | *313* | *390* | *414* | *401* |
| Very satisfied | 55% | 50%Ψ | 35%ΨʊΨ | 45%Ψ∞ | 45%Ψ∞ |
| Somewhat satisfied | 31% | 36% | 38% | 31% | 32% |
| Neither satisfied nor dissatisfied | 7% | 3% | 9% | 13% | 8% |
| Somewhat dissatisfied | 3% | 7% | 12% | 7% | 9% |
| Very dissatisfied | 2% | 3% | 5% | 4% | 6% |
| Don't know/Refused | 2% | 1% | 1% | <1% | 0% |

Ψ "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 Winter 2011 at the 90% confidence level.

Considering levels of CFL satisfaction by CFL expertise sheds further light on this indicator. The Team recognizes that it is not surprising that households using more CFLs have a greater tendency to be satisfied with them, but we thought it would be important to examine this variable for the two groups, particularly among CFL novices. Thus, as expected, the percentage of CFL experts who are "very satisfied" with CFLs is 50%, but only 34% of novices gave a similarly high rating—a significant difference (Table 7-2). Similarly, while levels of "very dissatisfied" CFL users were at 6% overall, only 2% of experts fell in this category, as opposed to 13% of CFL novices, another significant difference. Taken as a whole, then, the differences in satisfaction between novices and experts are only observed at the far ends of the scale. In other words, similar percentages of the two groups report moderate levels of CFL satisfaction. Perhaps the most important take-away from this analysis, however, is that the majority of CFL novices are somewhat or very satisfied with CFLs (65% taken together). Therefore, most novices do not dislike CFLs—they simply are not yet using them in large numbers—and they may be willing to transition to CFLs (and LEDs) instead of halogens in the post-EISA period if exposed to affordable models that fit their lighting needs.

**Table 7-2: Satisfaction with Standard CFLs by CFL Expertise**

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

| Level of satisfaction | Overall | CFL Experts | CFL Novices |
|---|---|---|---|
| *Sample size* | *401* | *269* | *130* |
| Very satisfied | 45% | 50% | 34%*Ω |
| Somewhat satisfied | 32% | 32% | 31% |
| Neither satisfied nor dissatisfied | 8% | 7% | 12% |
| Somewhat dissatisfied | 9% | 9% | 10% |
| Very dissatisfied | 6% | 2%* | 13%*Ω |
| Don't know/Refused | 0% | 0% | 0% |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

Due to the concerns raised in response to the decreased levels of satisfaction found in the Winter 2011 survey, the Team added questions in Summer 2012 to determine if respondents' satisfaction with CFLs had changed over time, and, if so, why their opinions had changed. The Winter 2012 respondents were posed the same questions. Roughly three out of four (73%) respondents in Winter 2012 said their satisfaction with CFLs had stayed the same, and 17% said their satisfaction had increased (Table 7-3). These numbers were very similar to Summer 2012. Only 9% in Winter 2012 replied that they were less satisfied with CFLs now than a year ago.

### Table 7-3: 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? | Summer 2012 | Winter 2012 |
|---|---|---|
| *Sample size* | *414* | *401* |
| Increased | 18% | 17% |
| Decreased | 5% | 9% |
| Stayed the same | 76% | 73% |
| Don't know/Refused | 1% | 1% |

These numbers, nonetheless, did show significant differences by CFL expertise. CFL experts (23%) were significantly more likely than CFL novices (4%) to say their satisfaction with CFLs increased (Table 7-4). Experts and novices were equally likely to show a decrease in satisfaction (9%), but novices were significantly more likely to say their satisfaction had stayed the same compared to experts (84% vs. 68% respectively).

### Table 7-4: Change in Satisfaction with CFLs Over Past Year by CFL Expertise

(Base: Respondents who had ever used CFLs)

| Has level of satisfaction with CFLs increased, decreased, or stayed the same? | Overall | CFL Experts | CFL Novices |
|---|---|---|---|
| *Sample size* | *401* | *269* | *130* |
| Increased | 17% | 23%* | 4%*Ω |
| Decreased | 9% | 9% | 9% |
| Stayed the same | 73% | 68% | 84%*Ω |
| Don't know/Refused | 1% | 1% | 3% |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

In contrast to the Summer 2012 survey findings, in Winter 2012 respondents were more likely to indicate that news stories did not influence their change in satisfaction. Of the 49 respondents who indicated their satisfaction with CFLs increased over the past year and who had been exposed to news stories about lighting, 59% said that news stories about CFLs were not responsible for that increase (Table 7-5). Similarly, of the 18 respondents in Winter 2012 whose satisfaction with CFLs decreased, 56% indicated that news stories were not responsible for the decrease. The pattern of findings was the opposite in Summer 2012, when the majority of respondents who reported a change in CFL satisfaction also indicated that news stories were responsible for the change. NMR suggests the PAs continue to track this measure as we believe it is likely that the phase-out of the most popular 60-Watt CFL will receive a great deal of media and possibly legislative attention.

### 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 Summer 2012 | Satisfaction Decreased Summer 2012 | Satisfaction Increased Winter 2012 | Satisfaction Decreased Winter 2012 |
|---|---|---|---|---|
| *Sample size* | *31* | *13* | *49* | *18* |
| Yes | 67% | 59% | 41% | 44% |
| No | 30% | 41% | 59% | 56% |
| Don't know/Refused | 3% | 0% | 0% | 0% |

When asked the reasons for increased CFL satisfaction, satisfied respondents provided a number of attributes. Whereas the brightness of CFLs was the most often provided reason in Summer 2012 (20%), in Winter 2012 respondents were more likely to cite the long bulb life (26%) of CFLs (Table 7-6). Respondents in Winter 2012 were also significantly more likely to mention the fast warm-up time of the bulb (25%) and money saved on their energy bill (18%) than Summer 2012 respondents. It seems that respondents in Winter 2012 were beginning to notice both the improved performance features of the bulbs, as well as their ability to save money over time.

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

(Base: Respondents whose satisfaction had increased)

| Reasons (Multiple Response) | Summer 2012 | Winter 2012 |
|---|---|---|
| *Sample size* | *82* | *69* |
| Long bulb life | 16% | 26% |
| Warm up faster | 9% | 25%* |
| Performance has improved | 17% | 19% |
| Money saved on energy bill | 7% | 18%* |
| Brightness | 20% | 15% |
| Variety of shapes and sizes/not just spiral | 18% | 15% |
| Energy saving/energy efficiency | 16% | 11% |
| Becoming more familiar with them | 4% | 11% |
| Light color/quality is better | 10% | 10% |
| Price/cost of bulb | 6% | 9% |
| Bulb doesn't get hot | 5% | 4% |
| Dimmability | 2% | 3% |
| Better for environment | 2% | 3% |
| Availability/easier to find | 2% | 2% |
| Don't know/Refused | 5% | 0% |

* Significantly different from Summer 2012 at the 90% confidence level.

Respondents who cited a decrease in satisfaction with CFLs over the past year were also asked to provide specific reasons. Two out of five (40%) respondents in Winter 2012 cited mercury or disposal issues as the reason for their decreased satisfaction, a significant increase over the 14% who cited it in Summer 2012 (Table 7-7). Conversely, only one out of five (20%) respondents in Winter 2012 cited poor light output/brightness/color of CFLs which was a significant decrease from Summer 2012 when almost one half of respondents pointed to that issue (48%). Dissatisfaction with bulb life (29%) and taking too long to warm up (20%) were other popular reasons for dissatisfaction. Nine percent of respondents also mentioned a simple preference for LEDs or other efficient bulbs. It is important to note the very small sample size for these questions, which limits the ability to generalize from these results or to expect stability in responses over time.

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

(Base: Respondents whose satisfaction had decreased)

| Reasons | Summer 2012 | Winter 2012 |
|---|---|---|
| *Sample size* | *21* | *35* |
| Mercury/disposal issues | 14% | 40%* |
| Shorter bulb life than promised | 19% | 29% |
| Poor light output/brightness/color | 48% | 20%* |
| Take too long to warm up | 5% | 20%* |
| LEDs/other efficient bulbs are better | 10% | 9% |
| Too expensive | 5% | 9% |
| Don't like the government forcing us to use them | 5% | 6% |
| Don't like the look of the bulb | 10% | 3% |
| Not compatible with fixtures | 0% | 3% |
| Don't know/Refused | 5% | 3% |

* Significantly different from Summer 2012 at the 90% confidence level.

In Winter 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 on the next page 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 52% of satisfied Winter 2012 respondents and 43% of dissatisfied Winter 2012 respondents; a significant increase over dissatisfied Summer 2012 respondents. Also showing a significant increase was the type of light CFLs give (11%). Further, 4% of the overall Winter 2012 sample mentioned the size of CFLs (or the fact that they now come in smaller sizes) as a reason they liked them, which had never been mentioned in previous waves. This may indicate that consumers are taking note of the greater variety of CFLs currently on the market.

## 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 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Mid-2012 | Winter 2012 | Winter 2011 | Mid-2012 | Winter 2012 | Winter 2011 | Mid-2012 | Winter 2012 |
| *Sample size* | *280* | *310* | *312* | *107* | *103* | *89* | *390* | *414* | *401* |
| Save energy | 49% | 51% | 52% | 36% | 31% | 43%$^{\alpha}$ | 45% | 47% | 50% |
| Longer bulb life | 36% | 40% | 31%$^{\alpha}$ | 16% | 20% | 11%$^{\alpha}$ | 30% | 36%$^{*}$ | 26%$^{\alpha}$ |
| Save money on bills | 21% | 20% | 22% | 10% | 20%$^{*}$ | 13% | 18% | 20% | 20% |
| Do not like anything about them/negative impression | 3% | 3% | 3% | 26% | 19% | 31%$^{\alpha}$ | 9% | 7% | 9% |
| Good quality | 12% | 7%$^{*}$ | 7%$^{*\alpha}$ | 2% | 3% | 2% | 9% | 6% | 6% |
| Brighter/brightness | 14% | 6%$^{*}$ | 9%$^{*\alpha}$ | 2% | 1% | 4% | 10% | 5%$^{*}$ | 8%$^{\alpha}$ |
| Don't get hot | 12% | 6%$^{*}$ | 8%$^{\alpha}$ | 1% | 1% | 3% | 8% | 5%$^{*}$ | 7% |
| Help environment | 4% | 6% | 6% | 4% | 6% | 5% | 4% | 6% | 6% |
| Convenience/easy to install | 3% | 3% | 2% | 3% | 6% | 2% | 3% | 4% | 2%$^{\alpha}$ |
| Type of light i.e. soft, clear | 4% | 8%$^{*}$ | 11%$^{*\alpha}$ | 1% | 2% | 4% | 3% | 6%$^{*}$ | 9%$^{*}$ |
| Cheaper | 2% | 4% | 4% | 1% | 3% | 1% | 1% | 4%$^{*}$ | 4%$^{*}$ |
| Color/color choices | 2% | 1% | 1% | 1% | 1% | 0% | 2% | 1% | <1% |
| Durability | 2% | 1% | 1% | 0% | 1% | 0% | 1% | 1% | 1% |
| They are versatile/many uses | 1% | 1% | 2% | 1% | 1% | 0% | 1% | 1% | 1% |
| Resemble incandescents in shape | <1% | 1% | 1% | 2% | 0% | 0% | 1% | 1% | 1% |
| Bulb size/they are smaller | 0% | 0% | 4%$^{*\alpha}$ | 0% | 0% | 2% | 0% | 0% | 4%$^{*\alpha}$ |
| Other | 2% | 2% | 2% | 1% | 1% | 0% | 2% | 2% | 2% |
| Don't know/nothing in particular/no preference/refused | 3% | 4% | 6%$^{*\alpha}$ | 13% | 9% | 5%$^{*}$ | 6% | 5% | 6% |

$^{*}$ Significantly different from Winter 2011 at the 90% confidence level.

$^{\alpha}$ Significantly different from Summer 2012 at the 90% confidence level.

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

[b] Indicated that they were "neither satisfied nor 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 almost one-half (47%) of satisfied Winter 2012 respondents answered that there was nothing they disliked about CFLs, 26% of dissatisfied respondents mentioned the same thing, mainly because "neutral" responses were included in this group. A greater percentage of the Winter 2012 respondents in both groups found nothing they disliked about CFLs compared with the Winter 2011 respondents. However, a smaller percentage in Winter 2012 found nothing they disliked about CFLs compared to the Summer 2012 sample. The most likely reason for this decrease is the significantly greater percentage of Winter 2012 respondents mentioning mercury or disposal issues of CFLs. Compared to the 7% of satisfied respondents mentioning this issue in Summer 2012, 15% of satisfied respondents mentioned it in Winter 2012. The number also increased from 14% to 30% among dissatisfied respondents. The only other characteristic mentioned by more than 10% of the overall sample was the bulbs being slow to turn on or brighten. As mentioned throughout this report, the Winter 2012 sample seems to find less issues with the actual *performance* of CFLs, but do show greater concern for safety issues surrounding the bulbs.

## 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 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 | Winter 2011 | Summer 2012 | Winter 2012 |
| *Sample size* | *280* | *310* | *312* | *107* | *103* | *89* | *390* | *414* | *401* |
| Nothing I don't like about them | 42% | 54%* | 47%α | 19% | 38%* | 26%α | 36% | 50%* | 42%*α |
| Slow to turn on/brighten | 20% | 14%* | 18% | 34% | 27% | 22%* | 23% | 17%* | 19% |
| Mercury/disposal issues | 9% | 7% | 15%*α | 24% | 14%* | 30%α | 13% | 9%* | 18%*α |
| Poor light color | 8% | 5% | 7% | 13% | 16% | 14% | 10% | 8% | 8% |
| Not bright enough | 6% | 5% | 3%* | 20% | 14% | 14% | 9% | 7% | 6% |
| Poor light output | 3% | 1%* | 1% | 15% | 10% | 12% | 6% | 3%* | 4% |
| Don't like the look of bulb | 6% | 4% | 6% | 7% | 4% | 5% | 6% | 4% | 6% |
| Shorter bulb life than promised | 4% | 2% | 3% | 8% | 6% | 13% | 5% | 3% | 5% |
| Price/expense | 7% | 9% | 8% | 7% | 5% | 11% | 7% | 8% | 8% |
| Not suitable/don't fit certain fixtures | 3% | 7%* | 6%* | 3% | 3% | 7% | 3% | 6%* | 6%* |
| Flicker | 1% | <1% | 1% | 1% | 1% | 2% | 1% | <1% | 1% |
| Too bright | 2% | 1% | 2% | 0% | 1% | 2% | 2% | 1% | 2% |
| Buzz | 1% | <1% | 0% | 1% | 0% | 2% | 1% | <1% | 1% |
| Poor manufacturing | 1% | 2% | 2% | 2% | 0% | 6%α | 1% | 2% | 3% |
| Don't work with dimmer switch | 0% | 1% | 2% | 4% | 1% | 2% | 1% | 1% | 2% |
| Don't like government forcing consumers to buy them | 0% | <1% | <1% | 1% | 2% | 2% | 1% | 1% | 1% |
| Poor durability/break easily | 6% | 2%* | 1%* | 1% | 1% | 3% | 4% | 2% | 2%* |
| Not adaptable enough | 1% | 0% | <1% | 1% | 0% | 0% | 1% | 0% | <1% |
| Do not work in the cold | 1% | 1% | 1% | 1% | 0% | 2% | 1% | 1% | 1% |
| Other | 2% | 3% | 3% | 6% | 3% | 4% | 3% | 3% | 3% |
| Don't know/Refused | 6% | 1% | 1%* | 1% | 3% | 1% | 5% | 1% | 1%* |

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

α Significantly different from Summer 2012 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.

We also assessed the reasons respondents liked and disliked CFLs by CFL expertise; this analysis revealed an interesting pattern. As expected, CFL experts expressed more strongly positive opinions about various characteristics of CFLs than did novices (Table 7-10). They named that CFLs save energy (57%), had long life (29%), and saved money on bills (26%) at significantly greater rates than did novices (35%, 19%, and 7% respectively). Novices, in contrast, were significantly more likely to say there was nothing they liked about CFLs (19% vs. 5%) or that they did not have an answer to provide (12% vs. 3%), which may have been a polite way to avoid saying something negative. The unexpected findings, however, arose when analyzing the things respondents did not like about CFLs—experts and novices disliked the same things about CFLs and at virtually the same frequencies (i.e., they were not statistically different) (Table 7-11). Therefore, it seems that some consumers are willing to overlook the things they dislike about CFLs to take advantage of the energy and bill savings and long life, but others seem unwilling to look past the less desirable characteristics in order to enjoy these benefits.

### Table 7-10: Reasons Respondents Like CFL Bulbs by CFL Expertise

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

| Reasons (Multiple Response) | Total | | |
|---|---|---|---|
| | Overall | CFL Experts | CFL Novices |
| *Sample size* | *401* | *269* | *130* |
| Save energy | 50% | 57%* | 35%*Ω |
| Longer bulb life | 26% | 29% | 19%*Ω |
| Save money on bills | 20% | 26% | 7%*Ω |
| Do not like anything about them/negative impression | 9% | 5%* | 19%*Ω |
| Type of light i.e. soft, clear | 9% | 10% | 9% |
| Brighter/brightness | 8% | 7% | 10% |
| Don't get hot | 7% | 8% | 4%Ω |
| Good quality | 6% | 6% | 7% |
| Help environment | 6% | 7% | 3%Ω |
| Cheaper | 4% | 5% | 0%*Ω |
| Bulb size/they are smaller | 4% | 4% | 4% |
| Convenience/easy to install | 2% | 2% | 1% |
| Resemble incandescents in shape | 1% | <1% | 2% |
| They are versatile/many uses | 1% | 2% | 1% |
| Durability | 1% | 1% | 0% |
| Color/color choices | <1% | <1% | 0% |
| Other | 2% | 2% | 1% |
| Don't know/nothing in particular/no preference/refused | 6% | 3%* | 12%*Ω |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

## Table 7-11: Reasons Respondents Do Not Like CFLs by CFL Expertise

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

| Reasons (Multiple Response) | Total | | |
|---|---|---|---|
| | Overall | CFL Experts | CFL Novices |
| *Sample size* | *401* | *269* | *130* |
| Nothing I don't like about them | 42% | 42% | 42% |
| Slow to turn on/brighten | 19% | 21% | 15% |
| Mercury/disposal issues | 18% | 19% | 18% |
| Poor light color | 8% | 7% | 11% |
| Not bright enough | 6% | 5% | 6% |
| Poor light output | 4% | 3% | 7% |
| Don't like the look of bulb | 6% | 6% | 6% |
| Shorter bulb life than promised | 5% | 4% | 6% |
| Price/expense | 8% | 8% | 10% |
| Not suitable/don't fit certain fixtures | 6% | 6% | 6% |
| Flicker | 1% | 1% | 1% |
| Too bright | 2% | 1% | 3% |
| Buzz | 1% | <1% | 1% |
| Poor manufacturing | 3% | 3% | 3% |
| Don't work with dimmer switch | 2% | 2% | 0%* Ω |
| Don't like government forcing consumers to buy them | 1% | 1% | 1% |
| Poor durability/break easily | 2% | 2% | 2% |
| Not adaptable enough | <1% | <1% | 0% |
| Do not work in the cold | 1% | 2% | 1% |
| Other | 3% | 3% | 3% |
| Don't know/Refused | 1% | <1% | 2% |

* Significantly different from overall at the 90% confidence level.
Ω Significantly different from CFL Expert at the 90% confidence level.

Respondents who had used dimmable CFLs were also asked what they did not like about this product. As with standard CFLs, the most frequent response was that there is nothing the Winter 2012 respondents did not like about dimmable CFLs (58%) (Table 7-12). 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 (6%).

### Table 7-12: 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) | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|
| *Sample size* | *193* | *201* | *188* |
| Nothing I don't like about them | 55% | 61% | 58% |
| Slow to turn on/brighten | 9% | 6% | 6% |
| Do not dim to low light levels/Do not dim as low as incandescents | 6% | 5% | 6% |
| I don't currently use them | 6% | 9% | 0% |
| Need to replace switch/need compatible switch | 3% | 2% | 0% |
| They don't work well (unspecified) | 2% | 1% | 0% |
| Price/too expensive | 4% | 4% | 4% |
| Poor light color | 2% | 4% | 1% |
| Flicker | 2% | 2% | 3% |
| They are hard to find | 3% | 2% | 1% |
| Not bright enough | 1% | 2% | 2% |
| Shorter bulb life than promised | 2% | 4% | 2% |
| Mercury/disposal issues | 1% | 2% | 2% |
| Buzz | 1% | 2% | 2% |
| Poor manufacturing | 2% | 1% | 1% |
| Dislike everything about them | 2% | 1% | 1% |
| Don't fit in my fixtures | 1% | 1% | 1% |
| They aren't as efficient | 1% | 0% | 0% |
| When dimmed with other CFLs, light level or brightness is not the same for all bulbs | <1% | 1% | 1% |
| Other | 0% | 2% | 2% |
| Don't know/Refused | 7% | 6% | 15% |

# 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[22], we present the *unweighted* demographic data across the four years. We point out when these divergent sampling strategies appear to have resulted in different sample characteristics. We also examine noteworthy differences in demographic characteristics between CFL experts and CFL novices, as such differences could be useful to explain the source of their variation regarding lighting and assist in future campaigns geared at targeting the specific groups.

## 8.1 Housing Characteristics

By design, approximately one-half (50%) of Winter 2012 respondents resided in single-family detached homes or single-family attached homes (Table 8-1), with 49% residing in multifamily homes, resulting in a sample that is more similar to the percentage of single-family and multifamily homes in Massachusetts than captured in previous surveys.

**Table 8-1: Type of Home**

(Base: All Respondents)

| Type of home | Mass. Census | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|---|
| *Sample size* | *2,520,419*[*] | *503* | *381* | *582* | *604* | *600* |
| Single-family detached house | 52% | 68% | 65% | 64% | 64% | 40% |
| Single-family attached house (townhouse, row house, or duplex) | 5% | 15%[**] | 13% | 14% | 12% | 10% |
| Apartment building with 2-4 units | 21% | 6% | 9% | 10% | 11% | 49% |
| Apartment building with 5 or more units | 21% | 8% | 11% | 10% | 12% | |
| Mobile home or house trailer | 1% | 1% | 1% | <1% | <1% | 1% |
| Other | 0% | 1% | 1% | 1% | 2% | 1% |
| 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.

[22] 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, but the late-2012 study over sampled multifamily homes in support of recruitment efforts for the regional hours of use study.

Examining housing characteristics by CFL expertise, reveals that experts are more likely to live in single-family homes, and novices are more likely to live in apartment buildings. More than 60% of CFL experts live in single-family detached or single-family attached homes while 42% of novices live in single-family homes (Table 8-2). In contrast, 37% of CFL experts live in apartment buildings, compared to 57% of CFL novices.

**Table 8-2: Type of Home by CFL Expertise**

(Base: All Respondents)

| Type of home | Mass. Census | Winter 2012 | CFL Experts | CFL Novices |
|---|---|---|---|---|
| *Sample size* | *2,520,419*[*] | *600* | *269* | *329* |
| Single-family detached house | 52% | 40% | 53% | 32% |
| Single-family attached house (townhouse, row house, or duplex) | 5% | 10% | 9% | 10% |
| Apartment building with 2-4 units | 21% | 49% | 37% | 57% |
| Apartment building with 5 or more units | 21% | | | |
| Mobile home or house trailer | 1% | 1% | 0% | 1% |
| Other | 0% | 1% | 1% | 1% |
| Don't know/Refused | - | - | - | - |

[*] Total occupied housing units

Respondents living in houses also revealed the decade in which their home was built. As in previous years, the largest percentage of homes in Winter 2012 were built before 1930, but the homes in the survey samples still tend to be somewhat older than those in the state overall (Table 8-3).

### Table 8-3: Decade in Which Home was Built

(Base: Those living in single-family houses)

| Decade | Mass. Census | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|---|
| *Sample size* | *2,520,419*[*] | *409* | *296* | *458* | *456* | *304* |
| 1930s or earlier | 35% | 26% | 31% | 25% | 24% | 31% |
| 1940s | 6% | 7% | 4% | 5% | 4% | 6% |
| 1950s | 12% | 13% | 14% | 13% | 15% | 15% |
| 1960s | 11% | 9% | 10% | 13% | 14% | 5% |
| 1970s | 12% | 11% | 10% | 11% | 11% | 12% |
| 1980s | 11% | 13% | 13% | 11% | 13% | 13% |
| 1990s | 8% | 12% | 7% | 9% | 7% | 8% |
| 2000 or later | 7% | 6% | 9% | 9% | 9% | 8% |
| Don't know/Refused | - | 3% | 3% | 2% | 2% | 2% |

* Total occupied housing units

Just over three out of five (62%) respondents indicated being the owners of their homes in Winter 2012, while the remaining 38% rented or leased (Table 8-4). These results are different from 2009 through Summer 2012, when we surveyed a greater proportion of owners. The higher percentage of renters in Winter 2012 is due to over sampling multifamily homes, which also had the advantage of very closely approximating the owner/renter split in Massachusetts as a whole.

### Table 8-4: Ownership of Home

(Base: All Respondents)

| Tenure | Mass. Census | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|---|
| *Sample size* | *2,520,419* | *503* | *381* | *582* | *604* | *600* |
| Own/Buying | 62% | 82% | 75% | 78% | 77% | 62% |
| Rent/Lease | 38% | 17% | 24% | 21% | 23 | 38% |
| Occupied without payment or rent | - | 0% | <1% | 0% | <1% | 0% |
| Other | - | 0% | 0% | <1% | 0% | <1% |
| Don't know/Refused | - | 1% | <1% | <1% | <1% | <1% |

Considering home ownership by CFL expertise, the results from the Winter 2012 survey indicate that the majority of CFL experts (75%) own or are in the process of buying in their homes (Table 8-5), which is consistent with the finding above that CFL experts are more likely to live in single family homes than multifamily homes or apartment buildings. The owner/renter split is more evenly distributed among CFL novices. Fifty-one percent of novices reported that they own their home, and 48% rent or lease.

### Table 8-5: Ownership of Home by CFL Expertise

(Base: All Respondents)

| Tenure | Mass. Census | Winter 2012 | CFL Experts | CFL Novices |
|---|---|---|---|---|
| *Sample size* | *2,520,419* | *600* | *269* | *329* |
| Own/Buying | 62% | 62% | 75% | 51% |
| Rent/Lease | 38% | 38% | 25% | 48% |
| Occupied without payment or rent | - | 0% | 0% | 0% |
| Other | - | <1% | 0% | <1% |
| Don't know/Refused | - | <1% | 0% | <1% |

The majority of homes surveyed in Winter 2012 were less than 3,500 square feet (98%) in size (Table 8-6). The greatest single percentage of homes in Winter 2012 fell in the size range of less than 1,400 square feet. The homes were smaller in general in Winter 2012 than previous years because we sampled more multi-family homes. Note that the Census does not track the square footage of homes.

### Table 8-6: Size of Home

(Base: All Respondents)

| Square Feet | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample size* | *350* | *273* | *441* | *517* | *467* |
| Less than 1,400 | 24% | 34% | 32% | 32% | 41% |
| 1,400 – 1,999 | 28% | 25% | 29% | 36% | 32% |
| 2,000 –2,499 | 19% | 19% | 17% | 15% | 17% |
| 2,500 – 3,499 | 16% | 14% | 15% | 13% | 8% |
| 3,500 – 3,999 | 3% | 5% | 4% | 2% | 1% |
| 4,000 – 4,999 | 3% | 2% | 2% | 1% | 1% |
| 5,000 or more | 6% | 2% | 2% | 2% | 1% |
| Don't know/Refused (sample size) | 153 | 108 | 141 | 87 | 133 |

While the Winter 2012 survey included respondents with smaller homes overall, CFL novices were more likely to report living in a home of less than 1,400 square feet (the smallest category listed). Just over one-half of novices (51%) reported home sizes in this category, compared to 30% of CFL experts (Table 8-12). Further, 31% of CFL experts reported home sizes between 2,000 and 3,500 square feet, compared to 17% of novices.

### Table 8-7: Size of Home by CFL Expertise

(Base: All Respondents)

| Square Feet | Winter 2012 | CFL Experts | CFL Novices |
|---|---|---|---|
| *Sample size* | *467* | *231* | *234* |
| Less than 1,400 | 41% | 30% | 51% |
| 1,400 – 1,999 | 32% | 36% | 29% |
| 2,000 –2,499 | 17% | 21% | 12% |
| 2,500 – 3,499 | 8% | 10% | 5% |
| 3,500 – 3,999 | 1% | 1% | 0% |
| 4,000 – 4,999 | 1% | 0% | 1% |
| 5,000 or more | 1% | 1% | 1% |
| Don't know/Refused (sample size) | 133 | 38 | 95 |

The numbers of rooms in respondents' homes are shown in Table 8-8. The most common number of rooms per home in Winter 2012 was evenly split between four and six (17% each). The higher percentage of homes with three or four rooms (and subsequent decrease in larger homes) than in previous years is an artifact of more multi-family sample.

### Table 8-8: Rooms in Home

(Base: All Respondents)

| Total Rooms | Massachusetts Census | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|---|
| *Sample size* | *2,520,419*[*] | *503* | *381* | *582* | *604* | *600* |
| 1 | 2% | <1% | 3% | 1% | 1% | 1% |
| 2 | 3% | 1% | 2% | 2% | 1% | 3% |
| 3 | 10% | 4% | 8% | 7% | 9% | 12% |
| 4 | 15% | 7% | 9% | 11% | 11% | 17% |
| 5 | 18% | 14% | 14% | 14% | 17% | 15% |
| 6 | 18% | 24% | 20% | 19% | 17% | 17% |
| 7 | 13% | 17% | 15% | 14% | 14% | 12% |
| 8 | 10% | 11% | 12% | 11% | 14% | 10% |
| 9 | 12%[**] | 8% | 9% | 8% | 6% | 5% |
| 10 or more | | 12% | 7% | 12% | 9% | 7% |
| Don't know/Refused | - | 2% | <1% | 1% | 1% | 1% |

[*]Total occupied housing units

[**] The ACS reports only 9 or more rooms.

Overall, CFL novices were more likely to report homes with fewer rooms, and they specifically represented a greater proportion of respondents from homes with three or four rooms. Combined, 39% of novices reported homes with three or four rooms, compared to only 16% of CFL experts (Table 8-9). Again, this finding is consistent with the greater proportion of CFL novices living in multifamily homes and apartments compared to CFL experts.

**Table 8-9: Rooms in Home by CFL Expertise**

(Base: All Respondents)

| Total Rooms | Massachusetts Census | Winter 2012 | CFL Experts | CFL Novices |
|---|---|---|---|---|
| *Sample size* | *2,520,419*[*] | *600* | *329* | *269* |
| 1 | 2% | 1% | 1% | 2% |
| 2 | 3% | 3% | 1% | 5% |
| 3 | 10% | 12% | 6% | 17% |
| 4 | 15% | 17% | 10% | 22% |
| 5 | 18% | 15% | 19% | 12% |
| 6 | 18% | 17% | 20% | 15% |
| 7 | 13% | 12% | 14% | 9% |
| 8 | 10% | 10% | 12% | 8% |
| 9 | 12%[**] | 5% | 7% | 3% |
| 10 or more | | 7% | 9% | 6% |
| Don't know/Refused | - | 1% | <1% | 1% |

[*]Total occupied housing units

[**] The ACS reports only 9 or more rooms.

## 8.2 Social Attributes

Respondents in late 2012 tended to hold a Bachelor's degree or higher (53%), which is similar to previous years (Table 8-10). This is one of the few characteristics that was not influenced by the multifamily sampling strategy.

**Table 8-10: Highest Level of Education**

(Base: All Respondents)

| Degree Attained | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample size* | *503* | *582* | *582* | *604* | *600* |
| Less than high school graduate | 3% | 3% | 2% | 2% | 4% |
| High school graduate (Includes GED) | 16% | 15% | 15% | 17% | 17% |
| Some college or associates degree | 20% | 25% | 21% | 23% | 25% |
| Bachelor's degree or higher | 57% | 56% | 61% | 57% | 53% |
| Don't know/refused | 3% | 1% | 2% | 1% | 2% |

Overall, CFL experts reported higher levels of education than CFL novices. Roughly three out of five (59%) CFL experts indicated holding a Bachelor's degree or higher compared to 47% of CFL novices (Table 8-11). Moreover, just 13% of CFL experts reported having a high school diploma/GED or less compared to 27% of CFL novices.

### Table 8-11: Highest Level of Education by CFL Expertise

(Base: All Respondents)

| Degree Attained | Winter 2012 | CFL Experts | CFL Novices |
|---|---|---|---|
| *Sample size* | *600* | *329* | *269* |
| Less than high school graduate | 4% | 3% | 5% |
| High school graduate (Includes GED) | 17% | 10% | 22% |
| Some college or associates degree | 25% | 26% | 25% |
| Bachelor's degree or higher | 53% | 59% | 47% |
| Don't know/refused | 2% | 1% | 2% |

The Winter 2012 respondents were more likely to live alone than were respondents in previous years, but the number is closer to Massachusetts overall (Table 8-12). Again, this likely reflects the multifamily sampling strategy. The most common household size among respondents across all years was two. This question was asked differently in 2009, so no comparable data are available for that year.

### Table 8-12: Number of Persons Living In the Home

(Base: All Respondents)

| Number of household members | Massachusetts Census | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|
| *Sample size* | *2,520,419*[*] | *381* | *582* | *604* | *600* |
| 1 | 29% | 21% | 17% | 21% | 26% |
| 2 | 32% | 37% | 37% | 39% | 37% |
| 3 | 16% | 15% | 19% | 16% | 15% |
| 4 | 22%[**] | 16% | 15% | 17% | 15% |
| 5 | | 7% | 7% | 5% | 5% |
| 6 or more | | 3% | 5% | 1% | 2% |
| Don't know/refused | - | 1% | <1% | 2% | 1% |

[*] Total occupied housing units

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

The sample was fairly evenly split between genders, although, similar to Winter 2011, slightly more than one-half of the Winter 2012 respondents were male (51%) (Table 8-13).

### Table 8-13: Gender

(Base: All Respondents)

| Gender | Massachusetts Census | 2009 | 2010 | Winter 2011 | Summer 2012 | Winter 2012 |
|---|---|---|---|---|---|---|
| *Sample size* | *6,547,629*[*] | *503* | *381* | *582* | *604* | *600* |
| Female | 52% | 60% | 55% | 49% | 53% | 49% |
| Male | 48% | 40% | 45% | 51% | 47% | 51% |

[*] 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.

Looking at gender of respondent by CFL expertise reveals that men (45%) and women (55%) showed roughly equal representation among CFL novices (Table 8-14). However, men were slightly more likely to be CFL experts (58%) than were their female counterparts (42%).

### Table 8-14: Gender by CFL Expertise

(Base: All Respondents)

| Gender | Massachusetts Census | Winter 2012 | CFL Experts | CFL Novices |
|---|---|---|---|---|
| *Sample size* | *6,547,629*[*] | *600* | *329* | *269* |
| Female | 52% | 49% | 42% | 55% |
| Male | 48% | 51% | 58% | 45% |

[*] 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.

# 9 Conclusions, Recommendations, and Considerations

In April of 2012, the Team delivered the Winter 2011 (first wave) consumer lighting report, which described EISA baseline conditions, as the survey coincided with the initial implementation of the new lighting standards. In October of 2012, the Team also delivered the Summer 2012 (second wave) consumer survey, which served as an interim check-in on the residential lighting market one-half year after the earliest phases of EISA implementation, and the Spring 2012 lighting saturation study, which provided information on residential lighting use during the early stages of EISA implementation. The current, Winter 2012, report assesses the residential lighting market a full year into EISA implementation to examine whether the phase-out of 100-Watt incandescent bulbs had affected consumer lighting behavior, and explore likely consumer reactions to the phase-out of 75-Watt incandescent bulbs, which became effective in January 2013. The major conclusions, two recommendations, and a number of considerations are offered below.

*Conclusion 1*: The Winter 2012 survey provides evidence that customer satisfaction with CFLs remains steady, with roughly one-half of respondents being "very satisfied" with the bulbs, and three out of four being "very or somewhat" satisfied. These percentages represent an increase over those observed in Winter 2011, which now appear to be a negative outlier.[23] A persistent concern with CFLs in Winter 2012 relates to their mercury content and disposal issues.

> *Recommendation 1*: The Team suggests continued tracking of CFL satisfaction throughout future consumer surveys in order to see if satisfaction remains stable in the post-EISA period, when CFLs will face serious competition from less efficient screw-in halogen bulbs and very efficient and long-lasting screw-in LED bulbs.
>
> *Consideration 1*: The PAs have little direct control over the persistent concerns about CFLs containing mercury. This represents a limitation of the technology. However, the PAs can continue to work with program partners to educate consumers about the best ways to dispose of CFLs (including retailer, town, and municipality recycling opportunities) and to clean-up one that has been damaged.

*Conclusion 2*: The Winter 2012 survey was the first to look at important measures of CFL use, knowledge, and opinions based by expertise, determined by self-reported use of CFLs. The results show many important differences between those using many CFLs (experts) and those using few or none of the bulbs (novices). CFL experts demonstrated a high level of lighting "savvy" by being significantly more knowledgeable about relative bulb energy use, more aware of EISA legislation, more familiar with key lighting terminology, more likely to choose CFLs as a preferred bulb option under future EISA phase-outs, less likely to hoard incandescents, and

[23] The 35% of respondents who reported being "very satisfied" with CFLs in Winter 2011 was significantly lower than any other of the Consumer survey waves. Given the consistency in this metric across all other waves, the Team concludes that CFL satisfaction is a relatively stable measure, and that the Winter 2011 numbers do not accurately reflect CFL satisfaction over time.

more likely to report high levels of satisfaction with the bulb. Importantly, the two groups agree on the factors they "dislike" about the bulb, particularly being slow to turn on/brighten, and mercury/disposal issues. Novices tended to have lower levels of educational attainment and to live in smaller, rented, or multifamily homes. Experts tended to hold a Bachelor's degree or higher, and live in single-family homes which they owned.

> *Consideration 2a*: Promotional efforts to increase use of energy-efficient lighting specifically geared to those not currently using CFLs or only using small numbers of them would seem to have greater impact than those geared at CFL experts. A key to winning over CFL novices to CFLs or LEDs may be to highlight testimonials from those who have adopted the bulb, and are quite satisfied with the bulb's performance. Bulb giveaways may also offer an opportunity to increase novices' use of CFLs. Although the Team is not evaluating multifamily retrofit programs, the results do point to continued efforts to work with landlords and condominium associations to install efficient lighting in multifamily buildings.
>
> *Consideration 2b*: Those already using large numbers of CFLs appear to have embraced the bulb type for many of their lighting needs, and report very high levels of satisfaction with them. However, it is likely that even CFL experts still have sockets that could be filled with specialty CFLs or with LEDs, providing at least some opportunities for gaining even greater savings from this lighting savvy group by stressing the diversity of lighting options available for numerous lighting scenarios and needs and the importance of changing out working but less-efficient bulbs for more efficient CFLs and LEDs.
>
> *Consideration 2c:* Given the disparities observed between CFL experts and novices, the Team suggests continued tracking of these differences. Future surveys could include additional batteries of questions aimed at learning more about the source of differences between experts and novices.

*Conclusion 3*: A subset of Winter 2012 survey respondents explained in open-ended responses to certain questions that they wanted to move to LEDs as their preferred lighting source, but were hesitant to spend $20 for a light bulb. As LED technology continues to improve and the market matures, it is likely that the lumens achieved per watt will increase, the price of the bulb will come down, and consumers will become convinced of the bulb's long life. At that point, more of them may be willing to pay the higher price for LEDs over halogens or CFLs. They also address some of the respondents' issues with CFLs, most notably, mercury content and slowness to brighten, although conflicting reports still exist on dimmability.

> *Consideration 3a*: In trying to increase adoption of LEDs, the PAs may want to consider educational materials that highlight the advantages of LEDs, but in a manner that does not denigrate CFLs. Further, the PAs should likely continue their efforts to keep the upfront cost of LEDs down while still maintaining program cost effectiveness.

*Consideration 3b*: The PAs could explore the optimal price point for LEDs in future evaluations and market assessments.

*Conclusion 4*: The timing of the Winter 2012 survey allowed us to shift the focus from the phase-out of the 100-Watt incandescent to the forthcoming phase-out of the 75-Watt incandescent bulb. When asked what bulb they would be likely to choose when the 75-Watt incandescent is no longer available, we noted an increase in consumers planning to move to a higher watt incandescent, although they would have to move to a 150-Watt or higher bulb to do this, and wattage limitations on fixtures may preclude this behavior.

*Consideration 4*: As new phases of the EISA legislation take shape it will be important to remind consumers that CFLs and other efficient lighting technologies come in wattages/lumens that are equivalent to various incandescent bulbs with which they are familiar. Even those currently using the popular 23-Watt CFL (meant to replace a 100-Watt incandescent) may not be familiar with the 18-Watt CFL we queried about in the current survey that is meant to replace the 75-Watt incandescent. Continued efforts that emphasize the importance of lumens rather than Watts for judging brightness and choosing bulbs may cut down on bin jumping. Such efforts could be enhanced with the assistance of retailers in terms of the point-of-purchase signage and limiting the availability of higher wattage incandescents.

*Recommendation 4:* Despite evidence that some consumers are having difficulties finding 100-Watt incandescent bulbs on store shelves, one-half of shoppers for these bulbs were able to buy them. Therefore, if they are not already doing so, when developing energy and demand savings assumptions post-EISA, the PAs should consider assuming that the former "baseline" incandescent bulbs will remain available for at least one year and not adjust their delta Watts to account for lower energy use of halogens or other bulb types until after that year.

*Conclusion 5:* Respondents to all three survey waves reported relatively low levels of familiarity with A-line CFLs, although there was a slight increase in familiarity with the bulb in Winter 2012 (16% reported being very familiar up from 13%).

*Consideration 5:* 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 suggests continued focus on PA educational and promotional efforts toward A-line CFLs, particularly the "instant-on" styles. The Team is also in support of the PAs' plans for 2013-2015 to consider them more as a "standard" CFL rather than a specialty one (although we understand that from manufacturing and incentive perspectives, the A-line costs more than spirals), as most A-line CFLs will be used in general service and not specialty applications.

*Conclusion 6*: The results presented for Winter 2012 show that one-fifth of respondents will consider stockpiling incandescent bulbs in light of the 75-Watt phase-out. The numbers increase

for those aware of EISA prior to the survey and for CFL novices. Further, both the Winter 2011 and Summer 2012 surveys as well as the onsite saturation effort suggested that about one-fourth of respondents would consider stockpiling 100-Watt incandescents, and that some respondents had already started to do so. Yet, only 9% of respondents reported actual stockpiling of 100-Watt incandescents in Winter 2012.

> *Consideration 6:* NMR suggests that the PAs continue to consider the feasibility of 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. The Team is aware of websites, point of purchase displays, and pamphlets that show consumers the types of energy-efficient bulbs available for different applications and fixture types.

*Conclusion 7:* Consumers are becoming more familiar with the term "lumens" and understand that it means light output or brightness, but they still buy bulbs based on wattage or wattage equivalence.

> *Consideration 7:* We believe that the suggestion made in the Winter 2011 and Winter 2012 reports that the PAs continue their efforts at helping consumers make the transition from thinking about Watts to thinking about lumens remains relevant.

# Appendix A Weighting Schemes from Previous Survey Waves

The Winter 2012 sampling strategy targeted 50% single-family and 50% multifamily households in the final sample. This represents a change from the other two survey waves in which we did not set targets for building type. The implication is that the Winter 2012 sample achieved a higher proportion of renters overall—and especially high-school educated renters—compared to the two earlier samples. We weighted the Winter 2012 sample on the same characteristics as in Winter 2011 and Summer 2012—and from 2009 and 2010 as well—in order to limit any bias in the results.

## Table A-1: Current and Previous Weighting Schemes

| **Winter 2012** | **Households** | **Sample Size** | **Weight** |
|---|---|---|---|
| *State Total* | *2,512,552* | *600* | |
| **Owner-occupied housing units** | | | |
| Less than high school graduate | 106,875 | 7 | 3.65 |
| High school graduate | 367,185 | 59 | 1.49 |
| Some college or Associate's degree | 397,959 | 97 | 0.98 |
| Bachelor's degree or higher | 736,455 | 205 | 0.86 |
| **Renter-occupied housing units** | | | |
| Less than high school graduate | 155,720 | 17 | 2.19 |
| High school graduate | 251,964 | 40 | 1.50 |
| Some college or Associate's degree | 226,427 | 54 | 1.00 |
| Bachelor's degree or higher | 269,967 | 110 | 0.59 |
| **Summer 2012** | **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 |
| **Winter 2011** | **Households** | **Sample Size** | **Weight** |
| *State Total* | *2,512,552* | *582* | |
| **Owner-occupied housing units** | | | |
| Less than high school graduate | 106,875 | 6 | 4 |
| High school graduate | 367,185 | 68 | 1.22 |
| Some college or Associate's degree | 397,959 | 91 | 0.99 |
| Bachelor's degree or higher | 736,455 | 288 | 0.59 |
| **Renter-occupied housing units** | | | |
| Less than high school graduate | 155,720 | 3 | 11.67 |
| High school graduate | 251,964 | 21 | 2.71 |
| Some college or Associate's degree | 226,427 | 28 | 1.82 |
| Bachelor's degree or higher | 269,967 | 66 | 0.94 |

# Appendix B Consumer Survey Questionnaire

The Winter 2012 questionnaire follows.

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 |
| Matt Nelson | Western Massachusetts Electric Company (WMECO/Northeast Utilities) | 781-441-3456 |
| Lisa Glover | Unitil (Fitchburg Gas and Electric) | 603-773-6483 |

Screeners:

R1. Are you 18 years of age or older?

1. Yes **[CONTINUE]**
2. No **[THANK AND TERMINATE]**

98. (Don't know/refused) **[THANK AND TERMINATE]**

R2. Is your permanent address in Massachusetts?

1. Yes [**CONTINUE**]
2. No [**THANK AND TERMINATE**]

98. (Don't know/refused) **[THANK AND TERMINATE]**

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

1. Stand-alone or detached single-family home
2. Townhouse or side-by-side duplex, with a wall separating the units from basement to roof, and with separate utilities for each unit
3. Multi-family building with two or more units, including top-bottom duplexes, and no basement walls separating the units, or with one water and sewer bill for the whole building
4. Mobile home or house trailer
5. Or something else? [SPECIFY] 98. (Don't know/refused)

DEM1A. (IF DEM1=5) *[INTERVIEWER: WAS THE HOME R DISCRIBED A CONDMINIUM?]*

1 Condominium
2 Something else (SPECIFY)

DEM1B. (IF DEM1A = 1) What type of condominium is it? Is it a . . .?
a. Townhouse or duplex condominium, with a wall separating the units from basement to roof, and with separate utilities for each unit [**CODE AS 2 ABOVE**]
b. Condominium in a building with two or more units and no basement walls separating the units, or with one water and sewer bill for the whole building [**CODE AS 3 ABOVE**]
Or something else? [SPECIFY: _____] [**CODE AS 5 ABOVE**]

DEM2.[ASK IF DEM1 = 3 OR DEM1B = 2] How many floors are in this multi-family building? Include all floors, even if they are used for retail or other business purposes?

[RECORD NUMBER OF STORIES; 998 = REFUSED, 999 DON'T KNOW]

## *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 light bulbs 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 AND S1 = 1 OR S2 = 1. OTHERWISE SKIP TO EISA1.]** 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 recent federal law, the Energy Independence and Security Act of 2007, restricts the sale of standard 100 watt incandescent bulbs manufactured after January 1, 2012 and standard 75 Watt incandescent bulbs manufactured after January 1, 2013. Had you heard about this 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. Do you currently use any 75 watt incandescent light bulbs in your home?

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

EISA6. **[IF EISA5 = 2]** Why don't you currently use any 75 watt incandescent light bulbs in your home? **[DO NOT READ RESPONSES; MULTPLE RESPONSE]**

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

96. DON'T KNOW
97. REFUSED

EISA7. **[IF EISA4 NE 1 AND EISA5 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

EISA8.**[**We are interested to know the type of bulb you would be likely to use instead of a 75-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 75-watt incandescent bulb. **[READ ONLY IF EISA5=2]** We understand that you do not currently use any [**IF EISA7=1 OR EISA4=1::** 75 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 EISA5 NE 2 OR EISA7 NE 2]** instead of the 75-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 53 Watt screw-in halogen bulb meant to replace a 75 watt bulb |
| 3. An 18 Watt screw-in compact fluorescent bulb meant to replace a 75 watt incandescent bulb |
| 4. A 16 to 18 Watt screw-in LED **[SAY THE LETTERS L-E-D]** or light-emitting diode bulb meant to replace a 75 watt incandescent bulb |
| 5. A higher wattage incandescent bulb |
| 96. DON'T KNOW **[ONLY ALLOW FOR ENTIRE QUESTION]** |
| 97. REFUSED **[ONLY ALLOW FOR ENTIRE QUESTION]** |

EISA9. **[SKIP IF EISA8 =D,R]** You said you would be most likely to instead use **[IF EISA8=1 READ:** a lower wattage incandescent bulb]/[**EISA8=2 READ:** a 53 Watt screw-in halogen bulb][**IF EISA8=3 READ:** an 18 Watt screw-in compact fluorescent bulb**]/[IF EISA8=4 READ:** a 16 to 18 Watt screw-in LED bulb**]/[IF EISA8=5 READ:** a higher wattage incandescent bulb)]. Why that bulb?

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

EISA10. The federal law I mentioned earlier restricted the sale of 100 Watt incandescent bulbs in January 2012. Did you buy extra 100 Watt incandescent light bulbs to save them for use after you cannot buy them on store shelves anymore?

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

EISA11. How likely are you to buy extra 75 Watt incandescent light bulbs and save them for use once the next phase of 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 75 Watt incandescent light bulbs for use?
96. DON'T KNOW
97. REFUSED

**[ASK CFL USE AND SATISFATION IF S3 = 1, 2, 3, AND S1 = 1 OR S2 = 1 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. It may seem like I'm asking the same question more than once, but first I'm going to ask you about 100 Watt incandescent bulbs and then I'm going to ask you about 75 Watt incandescent bulbs.

*[START ROSTER LOOP]*

**[BULBTYPE = "100-WATT" AND "75-WATT". THIS VARIABLE IS USED THROUGHOUT ROSTER. QUESTIONS ENDING WITH _1 ARE PERTAINING TO 100-WATT BULBS, WHILE QUESTIONS ENDING WITH _2 ARE PERTAINING TO 75-WATT BULBS.]**

BUY1_1-2**. [IF EISA4=2 OR EISA5 = 2 OR EISA7=2, READ** "Previously you told us that you don't currently use **[IF EISA4/EISA5 = 2 READ: BulbType]** incandescent bulbs, but…] Have you looked for **[BulbType]** incandescent bulbs, or regular **[BulbType]** bulbs, at any retailers in the past three months, even if you did not buy any?

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

BUY2_1-2. [**IF BUY1= 1**] In the past three months, when you looked for **[BulbType]** 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 **[BulbType]** 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_1-2**. [IF BUY2=2]** After not finding **[BulbType]** 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 BUY7]**
5. DON'T KNOW **[SKIP TO BUY7]**
6. REFUSED **[SKIP TO BUY7]**

BUY4_1-2. **[IF BUY3 = 1, 2, OR 3]** Were you able to find **[BulbType]** 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_1-2. **[IF BUY4 = 1, 2, 3 or BUY2 = 1]** Have you purchased any **[BulbType]** 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_1-2. **[IF BUY5 = 1]** How many **[BulbType]** 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_1-2. Now I'd like to ask you about the type of bulbs you might have bought instead of **[BulbType]** incandescents.

Have you purchased any light bulbs instead of **[BulbType]** 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]**

BUY7A-E_1-2. [IF BUY7 = 1] What type of bulbs did you buy instead of **[BulbType]** 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 **[BulbType]** 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

*[END ROSTER LOOP]*

BUY8. **[IF ANSWERED "YES" TO ANY IN BUY7A-E_1-2, 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 BUY16]**
96. Don't know **[SKIP TO BUY16]**
97. Refused **[SKIP TO BUY16]**

BUY8A-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_1-2 = 1) OR (S2 = 2, 96, or 97 or if S3=3, 4, DK, REF)**] Compact fluorescent lamps or CFLs that screw into regular light sockets

B. [**SKIP IF (BUY7C_1-2 = 1) OR (S4=3, 4, DK, REF)**] L-E-Ds that screw into regular light sockets

C. [**SKIP IF (BUY7D_1-2 = 1) OR (S5=3, 4, DK, REF)**] Halogen bulbs that screw into regular light sockets

D. [**SKIP IF (BUY5_1-2 = 1) OR (BUY7A_1-2 =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, DK, REF)**] Pin-based CFLs that can only be used in special light fixtures

G. **[SKIP IF S4=3 or 4, DK, REF]** 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

## *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 Error! Reference source not found.]**
96 DON'T KNOW **[SKIP TO Error! Reference source not found.]**
97 REFUSED **[SKIP TO Error! Reference source not found.]**

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)

# *CUSTOMER DEMOGRAPHICS*

Now I have a few more questions to ask you.

DEM3. In the next six months do you have any plans to move?

1. Yes [**GO TO DEM4; DO NOT COUNT IN DEM1QUOTA**]
2. No [**CONTINUE**]

98. (Don't know/refused) **[GO TO DEM4; DO NOT COUNT IN DEM1QUOTA]**

**[CHECK QUOTA COUNTS (TO BE PROVIDED): IF DEM1= 1, 2, OR 4 (SINGLE FAMILY); IF DEM1= 3 (MULTIFAMILY); IF DEM1= 5 OR 98 GO TO DEM3]**

R3. [INSERT PA] is offering you the opportunity to take part in an important study. We are offering eligible households $150 to allow a trained technician to visit their homes to gather more information about the lighting products they use. The visit should take about an hour. If your home is found to be eligible, the visit may also involve a trained technician walking through your home and recording the types of lighting products that you are using. The technician will also attach some very small devices to several light sockets in your home to record lighting usage. Most lamp or fixture shades will block the devices from view, so they won't affect your decor. They also won't affect how your lights work. When the technician returns to remove these devices in six months, you'll receive $100, for a total of $250 to participate in the study. During the visits, there will be no attempt to sell you anything. The information gathered will be used to evaluate and improve the energy efficiency programs offered by your electric utility.

Would you be interested in being a part of this type of visit?

1. Yes **[GO TO R5 BELOW FAQ]**
2. No **[GO TO DEM4]**

98. (Don't know **[GO TO FAQ]**

99. Refused) **[GO TO R4 BELOW FAQ]**

**FAQ – Answers to frequently asked questions:**

- **What is this device and how do I know what it does?** The device is called a "lighting logger." It is about the size of a business card but is ½ inch thick. The type of lighting logger we use can tell when you turn you the light it is attached to on and off, but it does not collect any other information. If you want to know what the loggers look like, they can be found easily through a web search of the term "lighting logger." We will mainly be using the "HOBO" and "DENT" brands.

**[THE PICTURE BELOW MAY BE ABLE TO HELP THE INTERVIEWER DESCRIBE THE LOGGER AND ITS SIZE TO THE RESPONDENT]**

- **What's in it for me and how long will this take?**
  - We are offering $150 for your time when we install the loggers and $100 when we pick up the logger six months later. This is a total of $250.
  - The visit should take around one hour, depending on the size of your house
- **What does the visit involve?** Technicians will walk around your home and count the various types of lighting products you have installed. They will also install some lighting loggers to record how often you use certain lights. The loggers are very small and will not interfere in any way with the normal use of your lights.
- **When will the visits take place? /Can I schedule a visit now?** We will be calling in December and January to schedule the visits. The visits will happen in January, after the holidays.
- **When do you remove the loggers?** The loggers need to remain in place for six months. At the end of six months we will return to remove the loggers. We will schedule the visits at a time that is convenient for you.
- **Who we are?** I am calling for the NMR Group, Inc., a consulting firm. We have been hired by the [INSERT PA] to perform this study.
- **Purpose of Study?**
  - Establish customer awareness of lighting options and changes in the lighting market
  - Understand how people use the light bulbs in their home, as this has a large impact on how much energy households use.

  - The results of the study will be used in planning for future energy needs in Massachusetts
- **How do I know you are legit?** [INSERT PA] are sponsoring this program and study. The contact person is [FILL IN INFORMATION FROM ABOVE, ASKING RESPONDENT WHICH PA SERVES THEM].

R4. [**IF R3=98**] That's OK; you do not have to decide now. Would it be OK if I take your name and have someone call you when we are scheduling these visits?

1. Yes **[CONTINUE TO R5]**
2. No **[GO TO DEM4]**

R5. [**IF YES, READ**. "I just need to get some contact information from you so we can call and schedule the visit."] What is your name? [RECORD]_____

R6. [**IF YES**] And what is the best number to call you about a visit?

**[RECORD NUMBER; IF SAME NUMBER CALLED FOR SURVEY INDICATE HERE]**_____

R7. [IS THERE A SECOND NUMBER THAT WE CAN ALSO TRY TO CALL YOU AT?**]**

_____

R8. [IF RESPONDENT VOLUNTEERS THAT THEY PREFER TO BE CONTACTED BY EMAIL COLLECT EMAIL ADDRESS. OTHERWISE, DO NOT COLLECT EMAIL ADDRESS.

EMAIL: _____]

R9. [IF YES] What is the best time of day to reach you? Morning, afternoon, or evening?

1. Morning
2. Afternoon
3. Evening

99. (Anytime/Don't know/refused)

[**IF YES**] In what city do you live, and what is your zip code?

R10. **CITY**: _____

R11. **ZIP CODE:** _____

When we call to schedule, your caller ID will most likely say "KEMA." or will have an 860 area code. Now, I just have a few more questions about some characteristics of your households. These questions will help us make sure we visit a wide variety of homes in the state.

DEM4. **[ASK DEM4 IF DEM1 = 1, 2 OR DEM1B= 1. OTHERWISE, SKIP TO DEM5.]** 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

DEM5. 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

DEM6. Approximately how large is your home? [READ LIST IF NECESSARY]

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

96. DON'T KNOW
97. REFUSED

DEM7. 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

DEM8. 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. Associates Degree
6. Bachelor's Degree
7. Graduate or Professional Degree
96. DON'T KNOW
97. REFUSED

DEM9. Counting yourself, how many people live in your home for most of the year?

1. (1) **[GO TO 0]**
2. (2) **[GO TO 0]**
3. (3) **[GO TO 0]**
4. (4) **[GO TO 0]**
5. (5) **[GO TO 0]**
6. (6) **[GO TO 0]**
7. (7) **[GO TO 0]**
8. (8) or more **[GO TO 0]**
98. (Don't know/refused) **[GO TO INTRO BEFORE 0]**

DEM10_1. [IF DEM9=1] Which of these categories best describes your total household income in 2011 before taxes—counting everyone living in your house?

1. Less than $31,300, OR [GO TO CONCLUSION]
2. $31,300 or more [GO TO CONCLUSION]
98. (Don't know/refused) [GO TO INTRO BEFORE 0]

DEM10_2. [IF DEM9=2] Which of these categories best describes your total household income in 2011 before taxes—counting everyone living in your house?

1. Less than $40,100, OR [GO TO CONCLUSION]
2. $40,100 or more [GO TO CONCLUSION]
98. (Don't know/refused) [GO TO INTRO BEFORE 0]

DEM10_3. [IF DEM9=3] Which of these categories best describes your total household income in 2011 before taxes—counting everyone living in your house?

1. Less than $50,600, OR **[GO TO CONCLUSION]**
2. $50,600 or more **[GO TO CONCLUSION]**
98. (Don't know/refused) **[GO TO INTRO BEFORE 0]**

DEM10_4. [IF DEM9=4] Which of these categories best describes your total household income in 2011 before taxes—counting everyone living in your house?

1 Less than $60,200 OR **[GO TO CONCLUSION]**
2. $60,200 or more **[GO TO CONCLUSION]**
98. (Don't know/refused) **[GO TO INTRO BEFORE 0]**

DEM10_5. [IF DEM9=5] Which of these categories best describes your total household income in 2011 before taxes—counting everyone living in your house?

1 Less than $69,800, OR **[GO TO CONCLUSION]**
2. $69,800 or more **[GO TO CONCLUSION]**
98. (Don't know/refused) **[GO TO INTRO BEFORE 0]**

DEM10_6. [IF DEM9=6] Which of these categories best describes your total household income in 2011 before taxes— counting everyone living in your house?

1. Less than $79,400, OR **[GO TO CONCLUSION]**
2. $79,400 or more **[GO TO CONCLUSION]**
98. (Don't know/refused) **[GO TO INTRO BEFORE 0]**

DEM10_7. [IF DEM9=7] Which of these categories best describes your total household income in 2011 before taxes— counting everyone living in your house?

1. Less than $81,200, OR **[GO TO CONCLUSION]**
2. $81,200 or more **[GO TO CONCLUSION]**
98. (Don't know/refused) **[GO TO INTRO BEFORE 0]**

DEM10_8. [IF DEM9=8] Which of these categories best describes your total household income in 2011 before taxes— counting everyone living in your house?

1. Less than $83,000, OR **[GO TO CONCLUSION]**
2. $83,000 or more **[GO TO CONCLUSION]**
98. (Don't know/refused) **[GO TO INTRO BEFORE 0]**

**[IF DON'T KNOW/REFUSE TO ANY OF 0 TO 0, OR IF (DEM9=DON'T KNOW/REFUSED), SAY "NOW I'M GOING TO ASK SOME QUESTIONS ABOUT BENEFITS YOU OR SOMEONE IN YOUR HOUSEHOLD MIGHT RECEIVE." RANDOMIZE 0-0. AS SOON AS ANYONE SAYS "YES" TO ANY OF 0 TO 0, SKIP TO CONCLUSION.]**

DEM11_A. Does anyone in your household receive cash assistance from the Massachusetts Department of Housing and Community Development, or DHCD?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_B. Does anyone in the household receive Food stamps from the Massachusetts Department of Housing and Community Development, or DHCD?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_C. Does anyone in the household receive Medicaid from the Massachusetts Department of Housing and Community Development, or DHCD?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_D. Does anyone in the household receive Medicare Part D subsidy?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_E. Does anyone in the household receive energy bill assistance, or help paying energy bills?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_F. Does anyone in the household receive Weatherization Assistance from a Community Action Agency?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_G. Does anyone in the household receive child care assistance from the Massachusetts Department of Housing and Community Development, or DHCD

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_H. Does anyone in the household receive food assistance from WIC [PROUNCED "WICK" AS WITH A CANDLE], or Women, Infants and Children?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM11_I. Does anyone in the household receive free or reduced-cost meals in a school breakfast or lunch program?

1. Yes **(GO TO CONCLUSION)**
2. No
98. (Don't know/refused)

DEM12. **[INTERVIEWER: DO NOT READ.]**

**Sex:**

1. Female
2. Male

**[CONCLUSION]** Thank you very much. **(IF R3=1 or R4 = 1:** As I said, we will be scheduling these visits in the next few weeks and will call you then.) Those are all the questions I have for you today.

Do you have any comments?

**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. |