



**Connecticut Lighting Focus Groups:  
Exploration of Changes in the Lighting  
Market and Reactions to Various  
Efficient Lighting Choices**

**Submitted to:  
Connecticut Energy Efficiency Board**

**Submitted by:  
NMR Group, Inc.**

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## Executive Summary

This report presents the results of six focus groups conducted by NMR Group Inc. (NMR) with Connecticut residents to assess light bulb preferences and perceptions. The focus groups took place between September 19, 2011 and September 21, 2011 in three Connecticut communities, and were funded by the Connecticut Energy Efficiency Fund (CEEF) in cooperation with Connecticut Light and Power (CL&P) and The United Illuminating Company (UI).

The focus group is a qualitative research methodology that is often used to understand how participants respond to new products or messages, among other topics. They are interactive in nature, with the moderator leading a structured discussion in which the attendees have conversations with each other, not just the moderator. In this highly informative approach, focus groups participants are usually not randomly selected and the sample sizes are too small to extrapolate results to the general population. Therefore, in many cases including this one, results from focus groups are paired with more quantitative approaches that allow extrapolation. All results presented in this report should be considered qualitative descriptions of the focus group participants' opinions, which inform, but do not necessarily represent, those of the entire population of Connecticut.<sup>1</sup>

The focus groups were conducted to provide information on the following objectives:

- Assess what consumers know about coming changes in the choices of light bulbs that will be available to them (*i.e.*, the phase out of many incandescent bulbs and the proliferation of bulbs meant to replace them)
- Estimate what actions they expect to take as a result of these changes, and explore their reasons for these choices
- Predict how increased knowledge and exposure might influence lighting choices in order to recommend steps that CL&P and UI could take to help consumers make better lighting choices after the phase out begins

The focus groups examined the following topics in order to meet these objectives:

- Qualities that focus group participants look for when purchasing light bulbs
- Knowledge of various lighting terms
- Initial responses to and understanding of the Energy Independence and Security Act's (EISA) phase out of incandescent bulbs and the new Lighting Facts label
- Reactions to a comparison of various light bulbs meant to replace incandescent bulbs and if and how this comparison alters participants' initial responses to the label and EISA phase out
- What information participants believed they still needed to make better lighting choices

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<sup>1</sup> Throughout the document, "participants" refers to focus group participants, not program participants, unless otherwise noted.

Because we expected that prior experience with compact fluorescent lamps (CFLs) and an inclination towards energy efficient lighting would lead to variation in participants' knowledge of lighting and reaction EISA and different styles of energy-efficient lighting bulbs, we held two focus groups with participants who used zero to five CFLs in their home (low users), two with those who used six to 15 CFLs (moderate users), and two with participants using more than 15 CFLs (high users). The focus groups confirmed that CFL use did have an impact on some, although not all, opinions about different types of light bulbs and EISA. We highlight the important similarities and differences in opinions among the groups as we discuss the findings.

## Key Findings

The focus groups were designed to ascertain participants' knowledge and opinions about lighting and EISA prior to the focus groups, their initial opinions and expected reactions to the phase out upon learning about it, and how increased information and exposure to five different bulb types (two covered CFLs, a spiral CFL, a halogen, and an LED) did or did not alter their opinions and expected reactions.<sup>2</sup> We focus our discussion of the key findings on the change in opinions over the course of the focus groups in order to provide a summary of this main objective. The main body of the report provides more detail on each of these findings, ordering them by objectives rather than "before and after" as described here.

*What participants consider when choosing light bulbs:* At the start of the focus groups, participants reported that they predominantly choose light bulbs based on price and Wattage, with the latter being equated with "brightness" by most participants until the moderator explained the difference between Watts (a measure of energy use) and lumens (a measure of light output or brightness). After being read a description of the incandescent phase out, participants persisted in stating that they would continue to buy bulbs based on price and brightness (now understanding that this was distinct from Watts) after the phase out begins. However, during the lighting display and the discussion that followed, bulb life and annual operating costs joined price and brightness as important characteristics that participants considered when choosing the bulbs in the display that they preferred the most.

*Changing Opinions about CFLs:* Although every participant in the focus groups reporting having at least one CFL installed in their homes, participants in all three CFL use groups raised some concerns about spiral CFLs. Participants who already use moderate to high numbers of CFLs tended to cite concerns related to aesthetics (*e.g.*, not liking the spiral shape in fixtures in which the bulb shows), fit in fixture (*e.g.*, not working with lamp shades that clip onto the bulb), or safety (*i.e.*, mercury). In contrast, those using fewer CFLs tended to complain more frequently about the price of CFLs, lack of brightness, and unflattering or greenish light. After the display, participants continued to voice concerns about spiral CFLs, but they showed strong preferences

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<sup>2</sup> We included two different covered CFLs because, despite identical ratings for brightness and color temperature, the light emitted by the two bulbs appeared different when illuminated.

for covered CFLs, with participants in all three user groups awarding covered CFLs the highest rank across the five bulbs. Importantly, most participants had not been familiar with covered CFLs prior to the focus groups, suggesting that increased exposure to these bulbs would also increase adoption of them. Participants who persisted in their dislike of spiral and covered CFLs after the display believed the light did not flatter their skin tone or was not bright enough.

*Knowledge of EISA and Expected Bulb Purchases after Implementation:* Prior knowledge of EISA was fairly low, and largely dependent on CFL use. Moderate and high CFL users more frequently had heard of the incandescent phase out and demonstrated a greater understanding of its provisions. In contrast, low CFL users remained unaware of the phase out, and those that had heard something about it often showed little actual understanding of the legislation. When asked what bulbs they would use after the incandescent phase out, most participants assumed they would switch to CFLs, which often led to a discussion of their likes and dislikes of this technology (see above). However, some participants also expressed interest in trying covered CFLs, A-shaped LEDs, and A-shaped halogens, even though they had been largely unfamiliar with these bulbs prior to the focus groups. After the lighting display, participants seemed most inclined towards buying covered CFLs after the incandescent phase out begins, although a few would choose the other technologies shown in the display.

*Stockpiling of Incandescent Bulbs:* Participants were split in their opinions on stockpiling or “hoarding” of incandescents prior to the phase out; low users were most likely to say that they already were hoarding or planned to hoard incandescents, while just one moderate user and no high users planned to stockpile the bulbs. After the lighting display, fewer participants were inclined to stockpile incandescent bulbs, as the characteristics of covered CFLs reduced most of their prior concerns about spiral CFLs. However, those participants who said they still would hoard incandescents believed that neither the spiral nor covered CFLs flattered their skin tone, were bright enough, or would be the best bulb for certain applications in their home.

*Information Participants Still Need to make Better Lighting Choices:* Participants found the new federal lighting facts label (see examples in [Appendix B](#)) useful and easy to understand, but with the caveat that this was only because the focus group moderator had provided them with definitions of the key terms used on the label. Participants believed that consumers would need to be educated on the meaning of the terms if the labels were going to be useful to the general public. They also argued that the labels were not sufficient in helping them—and they assumed other consumers—choose the best light bulbs for their lighting needs. Specifically, they desired more information on how the specifications of the newer bulbs compared to incandescent bulbs, what “warm” and “cool” appearances actually look like, translation of the annual operating costs into the average electricity rate for Connecticut, and comparisons of the energy savings among the various bulbs. The participants also expressed frustration at how different the five bulbs looked compared to each other, despite the fact that they were rated for similar levels of brightness and color temperature. Participants believed that consumers should be able to see

bulbs “in action” before buying so that they have a better idea of what the light will actually look like before installing the bulb in the home.

## Conclusions and Recommendations

The focus groups provided a great deal of insight into consumers current knowledge of changes soon coming to the lighting market, their initial reactions to the incandescent phase out, and the degree to which exposure to new information and bulb types changes those opinions and helps consumers select between light bulbs. NMR has drawn the following conclusions and recommendations from the focus group findings. The main report includes more detail on each of these conclusions and recommendations.

**Conclusion 1:** Although many participants had heard *something* about changes in lighting standards and the “banning” of certain light bulbs, their responses made clear that misconceptions abound about the breadth and implications of the changes in lighting efficiency standards that EISA will bring in January 2012.

**Recommendation 1:** The Companies should take part in efforts to educate consumers about the nature of the changes in lighting efficiency standards and what these changes will mean to them. This educational effort should be paired with other efforts described here to inform consumers about the new lighting options available to them, understanding of the terms on the lighting facts label, and how to make better lighting choices in the post-EISA lighting market.

**Conclusion 2:** Participants did not believe that currently available or planned aids such as the lighting facts label would be sufficient to help them choose light bulbs after the incandescent phase out. They particularly wanted more information on lighting terminology, how to pick a bulb most similar to the incandescent it was meant to replace, and what the operating costs and electricity savings would be in Connecticut instead of the national average.

**Recommendation 2a:** The Companies should consider developing point of purchase (POP) materials that complement the lighting facts label. Materials that define the various lighting terms, compare the bulb to its equivalent incandescent, explain how much the bulb would cost to run based on the average Connecticut electricity rate, and display the lifetime operating cost of equivalent bulbs (including the incandescent bulb it is meant to replace) would alleviate these widespread participant concerns.

**Conclusion 3:** The lighting display demonstrated that bulbs rated similarly for lumens and color temperature may appear very different in practice. Participants found the inconsistency frustrating and worried that they would buy a bulb based on the information on the package and label only to dislike the light it emitted once installing it at home.

**Recommendation 3a:** The Companies should work with retailers to design lighting displays in the stores so consumers can see a side-by-side comparison of bulbs.

**Recommendation 3b:** It is our understanding that the Companies have taken part in community festivals and special promotional events in which they display efficient lighting choices. The findings from the focus groups suggest that they should continue these efforts in order to make consumers aware of the range of efficient lighting options available and promote their use.

**Recommendation 3c:** The Companies should continue to distribute energy efficient light bulbs through such direct-install programs as Home Energy Solutions (HES and HES-IE). If the programs do not already do so, the Companies should consider installing bulbs of different lumens, shapes, and color temperatures, ideally after discussing with the occupants how they use the space and the type of light they prefer for it. They may also want to consider guaranteeing the life of the bulb for a specific amount of time.

**Conclusion 4:** Prior to the focus group, many participants did not use spiral CFLs for specific applications because they disliked the spiral shape or found spiral CFLs to be incompatible with certain fixtures and lamp shades. Most participants, moreover, had never seen a covered CFL prior to the focus group. After the lighting demonstration, covered CFLs emerged as the favorite bulbs among all CFL use groups.

**Recommendation 4:** The Companies should more strongly promote covered CFLs in marketing materials and in-store POP materials, lighting displays, and direct install programs. These efforts should emphasize the types of fixtures and shades in which it is appropriate or advisable to use covered CFLs.

**Conclusion 5:** Although they showed an inclination to consider brightness, bulb life, and operating costs during the lighting display, most participants persisted in stating that bulb price would remain one of their primary considerations in choosing a light bulbs even after the incandescent phase out.

**Recommendation 5:** The Companies should continue to support *covered* CFLs, ensuring that the incentives make covered CFLs price-competitive with, even if still somewhat higher than, A-shaped halogens. The Companies may also want to consider supporting spiral CFLs in the early stages of the phase out to capture those consumers that will purchase solely on price, leading them to choose the spiral CFL instead of an A-shaped halogen. The supports for spirals could be discontinued once consumers show a tendency to balance price with operating costs and measure life.

**Conclusion 6:** Most participants found the price of the LED, even when supported at the level it is today, to be too high for consideration when choosing a bulb.

**Recommendation 6:** If the Companies choose to continue supporting LEDs, they should consider targeting early adopters of energy efficient technology or those already predisposed to energy efficiency, such as participants in other CEEF programs. For example, the program could send coupons to prior CEEF participants, inviting them to buy a qualified LED at partner retailers.

**Conclusion 7:** Some focus groups participants argued that lighting represented such a small part of their overall expenses that they would not be willing to take the time to compare operating costs and savings when choosing bulbs in the store. In truth, in most homes not heated with electricity, lighting comprises a large portion of the annual electricity bill.

**Recommendation 7:** In order to help consumers make better lighting choices, the Companies should work to educate consumers through bill stuffers, marketing campaigns, and POP materials on the percentage of annual home electricity use attributable to lighting use.

**Conclusion 8:** Most participants strongly disliked the appearance of the LED used in the lighting demonstration, which relied on a yellow filter to achieve a warm color appearance. However, this bulb is currently being supported by the Companies as well as other program administrators in the Northeast. Furthermore, participants in all user groups voiced complaints that have persistently been raised about CFL quality, such as buzzing, long warm-up time, and dimmable CFLs not dimming correctly, among others.

**Recommendation 8:** When the Companies solicit bids for new agreements or memoranda of understanding with manufacturers and retailers to promote LEDs, they may want to include multiple models of A-shaped LEDs so that consumers can choose between those with yellow filters and those without the filters. Moreover, for LEDs and CFLs, the companies should continue to support only those bulbs that meet stringent requirements for quality testing (e.g., PEARL testing).

# 1 Introduction

This report summarizes the results of six focus groups assessing Connecticut residents' light bulb preferences and perceptions. The NMR Group, Inc. (NMR) conducted focus groups between September 19, 2011 and September 21, 2011 in three Connecticut communities: Farmington, North Haven, and Stamford. The focus groups were funded by the Connecticut Energy Efficiency Fund (CEEF) in cooperation with Connecticut Light and Power (CL&P) and The United Illuminating Company (UI), collectively referred to as the Companies.

The focus group is a qualitative research methodology that is often used to understand how participants respond to new products or messages, among other topics. The groups are interactive in nature—the moderator leads a structured discussion of the topic, with the attendees answering questions through conversations with each other, not just with the moderator. The focus group is often seen as being superior to one-on-one interviews and structured surveys at facilitating discussion on a diversity of issues and opinions related to a topic and at observing the thought-process that goes into formulating these opinions. While a highly informative approach, the focus group has two drawbacks: 1) participants are usually not randomly selected, and 2) sample sizes are often too small to extrapolate results to the general population. For these reasons, researchers often pair focus groups with another approach, such as a survey with randomly selected members of the target population.

With these strengths and weaknesses in mind, the EEB and NMR set forth the following objectives for the focus groups:

- Assess what consumers know about coming changes in the choices of light bulbs that will be available to them (*i.e.*, the phase out of many incandescent bulbs and the proliferation of bulbs meant to replace them)
- Estimate what actions they expect to take as a result of these changes, and explore their reasons for these choices
- Predict how increased knowledge and exposure might influence lighting choices in order to recommend steps that CL&P and UI could take to help consumers make better lighting choices after the phase out begins

The focus groups examined the following topics in order to meet these objectives:

- Qualities that focus group participants look for when purchasing light bulbs<sup>3</sup>
- Knowledge of various lighting terms
- Initial responses to and understanding of the Energy Independence and Security Act's (EISA) phase out of incandescent bulbs and the new Lighting Facts label

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<sup>3</sup> Throughout this document “participants” refers to focus group participants and not program participants unless otherwise noted.

- Reactions to a comparison of various light bulbs meant to replace incandescent bulbs and if and how this comparison alters participants' initial responses to the label and EISA phase out
- What information participants believed they still needed to make better lighting choices

Findings from the focus groups will complement and inform associated quantitative research activities, most likely consumer surveys and a lighting saturation study, to be conducted in 2012.

NMR recruited the focus group participants based on level of CFL familiarity and use as well as some key demographic factors, as described in the following section.

## 1.1 Site and Participant Selection

In order to complete these objectives in a neutral manner that included a range of customer types, six focus groups were held in three Connecticut communities. NMR selected focus group locations based on the following criteria:

- Location amenable to recruitment of both CL&P and UI customers
- Ease of access to the facility
- Professionalism of staff and quality of the available focus group and observation rooms
- Estimated cost of holding the groups at the facility

Ultimately, we held two groups each in Farmington, North Haven, and Stamford.

The participants in each of two groups had similar levels of self-reported compact fluorescent lamp (CFL) use due to the expectation that familiarity and prior use of efficient lighting may influence reactions to EISA, the various bulbs being sold to replace incandescents, and the Lighting Facts label. We selected the levels of CFL use based on the distribution of use identified in a 2009 report in which NMR found that about 36% of households had one to five CFLs installed, 37% had six to fifteen CFLs installed, and 27% had more than fifteen CFLs installed.<sup>4</sup> Taking the demographics and housing characteristics of the surrounding area into account, we assigned each facility two different CFL use groups, as shown in Table 1–1.

**Table 1–1: Focus Group Location and Self-Reported CFL Use**

	Farmington	North Haven	Stamford
Low Use: Zero to Five CFLs	X	X	
Moderate Use: Six to Fifteen CFLs	X		X
High Use: More than Fifteen CFLs		X	X

As discussed in more detail below, it is important to explain at the onset that we expected this study design to yield groups in which participants exhibited different levels of familiarity with

<sup>4</sup> NMR Group, Inc. 2010. *The Market for CFLs in Connecticut*. Delivered to the Energy Conservation Management Board on March 9, 2010.

and acceptance of CFLs. Overall, the design performed as expected, with the moderate- and high-use groups being more knowledgeable about lighting and accepting of CFLs than those in the low-use groups. However, prior CFL familiarity and use was sufficiently high in all groups—including the low-use groups—that we did not observe as many strong differences in pre-existing opinions on CFLs as anticipated. Therefore, the low-use group sometimes displayed as much awareness of CFL-related issues as the moderate- and high-use groups. Still, important differences remained among the groups, and we discuss them as appropriate.

NMR had originally planned to recruit focus group participants from CL&P and UI customer lists, but the Companies could not prepare random samples of customers quickly enough to meet the accelerated timeline of the focus groups.<sup>5</sup> Therefore, the focus group facilities recruited participants from among their potential respondent lists based on the following screening criteria set by NMR and the EEB project manager:

- No focus group participation in the past 12 months (to avoid inclusion of “professional” focus group respondents)
- Awareness and familiarity with CFLs, with those having no prior awareness of CFL assigned to the low-use group
- Number of CFLs reported to be in use in the home
- Mix of demographic characteristics including sex, age, and income

[Appendix A](#) contains the entire screener, including quotas for the number of participants with each demographic characteristic. Although the screener allowed those who do not use CFLs to be assigned to the low-use group, all focus groups participants had at least one CFL installed in their home. This does not mean that participants had embraced CFLs as their preferred lighting choice. Instead, it means that all participants had decided to use at least one CFL in the home. While we would have preferred to have had some participants that did not use CFLs, their lack of representation is not entirely unexpected given that the previously mentioned 2009 study found that 85% of homes in Connecticut had at least one CFL installed.<sup>6</sup> Moreover, the screener did not hide the fact that the focus group would be about lighting, which likely biased the group slightly toward those potential participants with at least some interest in the topic.

We recruited a total of 13 possible participants for each focus group (to guard against “no shows”) but allowed no more than ten to take part so as to ensure that the groups flowed smoothly and finished on time. In most cases, no more than 10 participants had arrived by the time the group started, but for two groups, the moderator had to choose which participants to

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<sup>5</sup> The focus groups needed to be performed as quickly as possible in order to provide information that will establish a pre-EISA baseline and give early feedback on consumer reactions to the Lighting Facts label and EISA so the EEB and the Companies could prepare for these transitions.

<sup>6</sup> NMR. *The Market for CFLs in Connecticut*. See Table 3–7, column labeled “On-sites (weighted)”. The unweighted percentage was 89%.

send home. This was done in a manner that ensured the greatest demographic diversity among the participants.

Table 1–2 summarizes the characteristics of the focus group attendees by location and self-reported CFL use.

**Table 1–2: Characteristics of Focus Group Attendees**

Characteristic	Farmington		North Haven		Stamford	
	Low Use	Moderate Use	Low Use	High Use	Moderate Use	High Use
Gender						
Female	5	5	4	5	5	5
Male	5	5	6	5	5	4
Age						
18-34	2	2	2	2	2	1
35-54	5	4	4	4	4	4
55 or older	3	4	4	4	4	3
Household Income						
Less than \$60,000	4	3	4	2	1	1
\$60,000 to \$89,999	3	3	2	1	3	2
\$90,000 to \$124,999	2	3	3	4	4	4
\$125,000 or more	1	1	1	3	2	2
<i>Number of Participants</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>9</i>

## 2 Findings

This section summarizes the findings from the focus groups, addressing each of the following objectives in turn:

- Assess what consumers know about coming changes in the choices of light bulbs that will be available to them
- Estimate what actions they expect to take as a result of these changes and explore reasons for these choices
- Predict how increased knowledge and exposure might influence lighting choices
- Additional information consumers will need to make better lighting choices after the incandescent phase out begins

Specifically, the focus group guide was designed to understand the evolution of respondents' opinions about the upcoming changes in the lighting market at the start of the focus group, after having the changes explained to them, and after having compared some of the light bulb choices meant to replace incandescent bulbs. The evolution serves as a springboard for recommendations, discussed in Section 3, on how the Companies can help consumers make better lighting choices. We tracked two issues throughout the focus groups, gauging changes as the moderator revealed additional information or displayed light bulbs: 1) what factors they consider (or would consider) when purchasing light bulbs, and 2) preferences for particular types of light bulbs. Additionally, we asked questions that provided supporting information to explain these considerations and preferences.

### 2.1 Knowledge and Understanding of Changes in Lighting Market

The first set of questions during the focus group set about determining participants' pre-group lighting behavior, knowledge, and opinions. These questions provided the baseline from which we could compare changes over the course of the focus group in response to the sharing of additional information or comparing different light bulbs.

#### 2.1.1 What Participants Consider when Shopping for a Bulb

At the beginning of the focus group, participants shared the three most important factors they consider when buying light bulbs. Not surprisingly, most participants across all groups (53 of the 59 participants in total) named price as one of the things they look for when selecting a light bulb (Table 2–1). About one-half of the participants (30 of 59) also mentioned the Wattage of the bulb, and another eleven participants mentioned brightness. At the start of the group, most participants associated Wattage with brightness, so these two responses can, for the most part, be considered the same.<sup>7</sup> Although an infrequent response, two high users noted that they

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<sup>7</sup> Seven of the 59 participants voiced some understanding that Watts and brightness were not the same thing, as shown in Table 2–3

specifically looked for non-fluorescent bulbs. These two participants had numerous light sockets in the home and were willing to use CFLs in many of them; yet, they simply did not like CFLs for certain applications (*e.g.*, in fixtures in which the light bulb is visible) or did not believe CFLs would work with particular fixtures (*e.g.*, in fixtures with harps or shades that clip onto the bulb). Other important characteristics participants considered when buying light bulbs included bulb life, energy efficiency, light output/brightness, bulb shape, bulb size (particularly as it pertained to fitting into relevant sockets), and whether the bulb had a cool or warm color appearance.

**Table 2–1: What Participants Consider when Purchasing a Bulb**

(All participants; multiple response; raw numbers shown)

<b>Bulb Characteristics</b>	<b>Low Users</b>	<b>Moderate Users</b>	<b>High Users</b>	<b>Total</b>
Price	20	18	15	53
Wattage	8	13	9	30
Life of Bulb	3	6	8	17
Energy Efficiency	6	3	6	15
Light Output/Brightness	3	5	3	11
Bulb Size	2	4	4	10
Warm or cool Color	3	4	3	10
Bulb Shape	6	1	2	9
Manufacturer	4	2	0	6
Dependability/Durability	0	2	2	4
Dimmability	0	1	3	4
Quantity (# in pack)	2	0	1	3
Choose a Non-fluorescent Bulb <sup>a</sup>	0	0	2	2
Disposal	1	0	0	1
Hot to the Touch	0	0	1	1
<i>Total</i>	<i>58</i>	<i>59</i>	<i>59</i>	<i>176</i>

<sup>a</sup> For specific applications or fixtures

### 2.1.2 Current Lighting Use

Although the focus group screener provided some idea on the number of CFLs in the home, we also wanted to determine the diversity of bulb types that participants used. To elicit such information, the moderator held up examples of different bulbs and asked participants to raise their hands if they had that type of bulb installed or not.<sup>8</sup> The choices included an incandescent bulb, a spiral CFL, a covered CFL, an A-shaped halogen, and an A-shaped LED. Due to the nature of the focus group and the lack of reliability in responses, we did not ask participants to tell us how *many* bulbs of each type they had, just if they had any of the bulbs or not.

Despite the fact that the screener allowed participants not using any CFLs to take part in the low-use groups, all 59 participants had at least one spiral CFL installed, which is higher than the number of participants (53) that had incandescents installed in their homes (Table 2–2). A few moderate to high use participants explicitly stated that they (four participants)—or a utility program (two participants)—had removed all the incandescent bulbs from their home, with the exception of a few specialty applications for which they could not find appropriate replacement CFLs. Although most participants had never seen a covered CFL prior to the focus group, ten of the participants, concentrated among moderate and high users had covered CFLs installed in their homes. Likewise, most had never seen A-shaped halogen or A-shaped LED bulbs before the group, and use of these bulb types was low. The moderator also inquired about dimmer switches and three-way bulbs, often seen as two of the technologies desired by householders. Most of the participants (53) had at least some dimmer switches in their homes, despite the fact that only four participants typically shopped for dimmability. Just over one-half of participants (36) had three-way bulbs in their homes.

**Table 2–2: Light Bulbs Currently in Use**  
(All participants; multiple response; raw numbers shown)

<b>Bulb Type</b>	<b>Low Users</b>	<b>Moderate Users</b>	<b>High Users</b>	<b>Total</b>
Spiral CFL	20	20	19	59
Standard Incandescent	20	18	15	53
Covered CFL	1	4	5	10
Halogen	1	1	2	4
LED	0	0	2	2
Dimmer Switches	14	19	19	52
Three-Way Bulbs	10	12	14	36
<i>Total</i>	<i>66</i>	<i>74</i>	<i>76</i>	<i>216</i>

### 2.1.3 Current Opinions about CFLs

<sup>8</sup> The moderator specifically instructed participants to think only about regular shaped, non-specialty bulbs but then later questioned the participants about dimmer and three-way switches.

Although every participant had at least one CFL installed in their home, it would be inaccurate to characterize the participants as having embraced CFLs as their preferred lighting technology. Certainly, the six households that had removed all incandescent bulbs had embraced energy efficient lighting, with CFLs being the most common bulb installed in their homes (by their own statement during the groups). Yet, 53 participants still had incandescent bulbs installed in their homes, and many of these participants—even some in the moderate and high use groups—voiced concerns about CFLs. As we discuss more in Section 2.1.6, over the course of the focus groups (particularly after being described the EISA provisions), participants cited many of the common complaints associated with CFLs. Because we discuss these concerns in greater detail below, it is important here to say only that, while participants in each CFL use group mentioned a variety of things they disliked about CFLs, the tendency was for those in the moderate or high use groups to adopt CFLs for many applications but reject them for others on aesthetic, practical (*i.e.*, fit in fixture), or safety (*i.e.*, mercury) grounds. In contrast, those using fewer CFLs tended to complain more frequently about the price, lack of brightness, and unflattering or greenish light of CFLs. We will return to these views at numerous points in the discussion, highlighting changing opinions about CFLs as the participants received new information or exposure to various lighting products, including covered CFLs.

#### 2.1.4 Prior Understanding of Key Lighting Terms

In order to gauge participants' understanding of key lighting terms, the moderator asked participants to define Watt (a unit of electricity), lumen (unit of brightness), color temperature (how warm or cool light appears, measured in Kelvin), and color rendition (how accurately artificial light reproduces colors as they appear in natural light).<sup>9</sup>

Not every respondent provided a definition of these terms, and those that did respond did not always provide a correct answer. Table 2–3 summarizes the number of responses given to define these terms and the number of responses that indicated at least some understanding of the term. For Watts, we also listed the number of responses that suggested a confusion of Watts with “brightness.” Responses indicating some level of understanding for each of the terms are as follows:

- Watts: energy output, unit of energy, power behind it, voltage/ampere
- Lumens: light output, brightness
- Color temperature: Kelvin, soft light, daylight, warm or cool light, *etc.*
- Color rendition: can see colors better

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<sup>9</sup> After asking for definitions of the four terms, the moderator explained each so that all participants had a shared understanding of the terms in order to discuss the upcoming changes in the lighting market.

**Table 2–3: Understanding of Key Lighting Terms**

Term	Category	Low Users	Moderate Users	High Users	Total
Watts	# Responses	3	8	4	15
	# Understanding	2	4	1	7
	# Brightness	0	3	1	4
Lumens	# Responses	4	4	3	11
	# Understanding	2	3	3	8
Color Temperature	# Responses	1	2	3	6
	# Understanding	1	2	3	6
Color Rendition	# Responses	2	0	3	5
	# Understanding	0	0	1	1

Of the fifteen responses given for a “Watt,” seven of them showed a general understanding that it represented the amount of energy something uses. Yet, four of the eight “incorrect” responses explicitly indicated that Watt meant “brightness.” The tendency to define Watt correctly did not differ across use groups. Eleven participants offered a definition of “lumens,” and eight actually captured the correct concept of brightness or light output. Incorrect answers for lumen suggested it captured the “soft or cool white light” or “the color of the light.” Moderate and high users were slightly more likely to provide correct definitions of lumens than low users.

Just six participants provided a definition of color temperature, and those that did were not entirely confident in their responses despite the fact that all of them hit on the correct idea. Responses generally took the form of “Does that mean...?” but the remainder of their responses were relevant to the terminology, asking if color temperature meant “how yellow or white the bulb appears,” “soft or harsh light,” “soft white or bright,” or “warm, cold, daylight or soft white.” One high-use participant simply responded “Kelvin,” indicating a familiarity with the unit of measurement on which color temperature is based. Of all terms, participants struggled most with color rendition. Only five participants offered a definition of color rendition, and just one participant—a high user—understood that it referred to how colors look under the light.

### 2.1.5 Participant Knowledge of EISA

The moderator also asked respondents what, if anything, they had heard about “upcoming changes in lighting standards from the federal government that have to do with incandescent light bulbs?” in order to establish prior awareness and understanding of the new EISA efficiency standards. Only a few participants recalled having heard anything about changes to lighting. One participant in a low user group indicated that the government wants to move to CFLs and potentially eliminate incandescents, while two other participants (one a low user and the other a high user) had heard about the recent shutdown of GE’s last American factory for producing incandescents. A third participant, a low user, had heard that there had been a vote on phasing out incandescent bulbs but it had not passed, which may be a misunderstanding of the failed

attempt to overturn the lighting standards portion of EISA. Among moderate and high CFL users, though, at least two people in each focus group accurately explained the phase out of incandescent bulbs, in several cases giving accurate dates of implementation.

### 2.1.6 Initial Participant Perceptions of EISA

After being given the opportunity to describe what they knew about changes to lighting standards, the moderator read a description of the changes, noting the implementation schedule and which types of bulbs would be affected by the standards and which would not (see the discussion guide in [Appendix B](#) for the actual text). After reading the description, the moderator asked participants what they thought about these changes.

The focus group participants shared a variety of opinions on the legislation with the moderator, but one key finding became apparent—they believed that spiral CFLs would become the new standard light bulb after the ban took place (see Section 2.2 below for more on expected reactions to EISA).<sup>10</sup> Their opinions about CFLs, then, factored heavily into “what they thought” about the incandescent phase out.

As mentioned in Section 2.1.3 above, despite the fact that all participants had at least one CFL installed, individuals in each focus group, regardless of whether the groups was high, moderate, or low use, voiced reservations about CFLs. The majority of these reservations came to light when discussing participants’ reactions to the phase out of incandescent bulbs. Table 2–4 lists the major CFL-related concerns raised by participants.<sup>11</sup> A clear pattern quickly emerged—participants in low user groups were more likely than those in moderate and high groups to voice CFL-related concerns about the incandescent phase out. Not only did more individual low users voice concerns, they also named a greater variety of concerns when compared to moderate and high users. Participants in all three groups noted concerns about the uneven quality of CFLs. Specific issues mentioned included buzzing, flickering, time to warm up, not bright enough, inability to dim regular models, dimmable CFLs not dimming correctly, color of the light, and life shorter than advertised.

At least one participant in each type of group also mentioned concerns about CFL disposal due to mercury. Some voicing this concern (especially low and moderate users) did not want to use CFLs in fixtures that could easily be knocked over, especially by children. Others worried that most people did not know to recycle CFLs and believed the environment would suffer as a

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<sup>10</sup> Many participants had just learned about the existence of covered CFLs and A-shaped halogens and LEDs during the focus group, so they were not able to discuss them in reference to concerns about EISA at this point in the group, which preceded the lighting demonstration.

<sup>11</sup> Note that this list is not exhaustive of the thoughts shared. Some participants fully embraced the new lighting efficiency standards, while others rejected what they saw as the government intervening to remove a choice from consumers. We have not addressed these responses because the legislation is a reality and not within the control of the EEB or the Companies. Instead, we focus this discussion on impressions of CFLs, as participants presumed they would become the new “standard” lighting technology.

consequence. One high user feared that the problem of too little recycling of CFLs would only worsen as the incandescent phase out led more households to adopt CFLs in large numbers.

Six low and moderate users raised an additional concern about spiral CFLs becoming the standard light bulb—they either did not like them at all (low users) or disliked them for or were unable to use them in specific applications (moderate users). Individuals voicing these concerns asserted one or more of the following: 1) CFLs gave their skin a sickly or green hue, 2) they did not like the appearance of spiral CFLs in fixtures in which the bulb shows, and 3) they could not use spirals in some fixtures with harps or with clip-on lamp shades. As we discuss in Section 2.2.1, some of participants (particularly in low use groups) concerned with the appearance of spirals or their fit with certain fixtures or shades showed marked interest in learning more about covered CFLs, which they had only learned about at the focus group.

Finally, five low users and two high users said they worried that some consumers—either themselves or people less fortunate than themselves—would not be able to afford the higher price of CFLs.

**Table 2–4: Concerns Raised about Incandescent Phase Out\***

(All participants; multiple response; raw numbers shown)

<b>EISA Opinion</b>	<b>Low Users</b>	<b>Moderate Users</b>	<b>High Users</b>	<b>Total</b>
Quality of CFLs not as high as desired	4	2	5	11
CFL disposal	3	4	1	8
Dislike, unable to use CFLs in certain applications	3	3	0	6
Higher cost of CFLs	5	0	2	7
<i>Total</i>	<i>15</i>	<i>9</i>	<i>8</i>	<i>32</i>

## 2.2 Expected Actions in Response to Changes

The second objective of the focus groups involved estimating participants expected actions in response to changes in the lighting efficiency standards and labeling. We caution that participants could only base predictions on their future responses to changes that have yet to occur on their prior experiences. Moreover, many had just learned about the changes in the focus group, so they had not had a great deal of time to consider their likely reactions before having to explain what they would be. In truth, we will only know how the focus groups participants and consumers more generally will respond to EISA after the phase out actually begins, suggesting the need for close monitoring of the market, as discussed later. The focus groups, however, provided a glimpse at how the participants thought they would respond to these changes, setting a baseline from which to compare expectations after the participants had been given additional information regarding the changes and the opportunity to view some of the lighting choices.

### 2.2.1 Bulb Choice and Type Likely to Use in Place of Incandescent

The moderator also asked participants which types of light bulb they would likely use once incandescent bulbs were no longer available. Although not every focus group attendee responded to this question, Table 2–5 shows the answers of those who did respond, and the responses point to some clear differences between groups.

Twelve of the 14 moderate CFL users providing an answer said they would most likely use spiral CFLs after the incandescent phase out took place, with the other two choosing LEDs or covered CFLs. Four of the high CFL users expected to use spiral CFLs after the ban; of the remaining four, two said they would move to LEDs (with the caveat that they would do so if the price came down), one to covered CFLs, and the last to the “most energy efficient option.” In other words, participants already using CFLs in moderate to high numbers assumed they would continue to use spiral CFLs, try out covered ones, or would move to even more efficient options.

The low users stood in contrast to the moderate and high users. Only one of the current low CFL users expected to choose CFLs after the incandescent phase out took place. Six of the remaining nine participants, however, expressed interest in trying covered CFLs, showing the importance they placed on the appearance of the bulb and its ability to fit with all fixtures and lamp shades. Two participants said they would likely try the A-shaped halogen, while the last participant would choose the cheapest option.

It is important to keep in mind that, prior to the focus group, all participants had been aware of spiral CFLs, but most only learned about covered CFLs or A-shaped halogen and LED bulbs during the group. Despite this fact, some participants wanted to give these technologies a try, usually because they remained somewhat dissatisfied with spiral CFLs or because they tended to be “early adopters” and wanted to try the latest technology.

The moderator also probed about other choices, such as using a specialty incandescents or jumping Wattage bins (*e.g.*, using a 72 Watt halogen to replace a 75 Watt incandescent), but participants did not believe they would pursue these options after the incandescent phase out took place.

**Table 2–5: Bulb Preferences after Phase Out**

(Participants who volunteered responses; multiple response; raw numbers shown)

Bulb Type	Low Users	Moderate Users	High Users	Total
Spiral CFL	1	12	4	17
Covered CFL	6	1	1	8
LED	0	1	2	3
Halogen	2	0	0	2
Cheapest Option	1	0	0	1
Most Energy Efficient Option	0	0	1	1
<i>Total</i>	<i>10</i>	<i>14</i>	<i>8</i>	<i>32</i>

Focus group participants also weighed in on whether the factors they consider when choosing a light bulb would change after the incandescent phase out. Interestingly, every participant said they would look for the same attributes in bulbs after the phase out as now, suggesting that price and light output (which respondents now understood was not the same as Wattage) would remain the critical factors in choosing bulbs. It is NMR’s opinion, however, that this response does not entirely reflect what will actually happen in the market place after the incandescent phase out. Certainly, consumers will remain concerned with price and light output, but the proliferation of bulb styles of different prices, Wattages, and measure lives will lead many consumers to think about their lighting purchases instead of grabbing the cheapest bulb on the shelf. Instead, they most likely will have to pause and consider the choices available in order to figure out which bulbs are “the cheapest” and which have the desired light output. The focus group participants, however, could only respond to this question based on their prior experiences and the limited amounts of new information they had gained during the focus group.

### 2.2.2 Stockpiling of Incandescents

The focus groups also explored whether participants were or intended to stockpile or “hoard” incandescent bulbs (Table 2–6). As could be expected, moderate to high CFL users who provided an answer to this question revealed that they are not currently hoarding incandescents. Only a single moderate said she was considering hoarding, and she explained it would be for those sockets in which the bulb appearance or fit in the fixture or shade were important. In contrast to moderate and high users, nine of the ten low CFL users who responded to this question said they either were currently hoarding or would consider doing so now that they knew that incandescents would be phased out. Despite these responses, NMR cautions that, as participants return to their homes and identify sockets for which it is difficult to find a CFL replacement, they may alter their opinions on hoarding and follow the lead of the moderate user who was considering hoarding at least for specific applications only.

**Table 2–6: Incandescent Hoarding**

(Participants who volunteered responses; raw numbers shown)

Consider Hoarding?	Low Users	Moderate Users	High Users	Total
No, would not hoard	1	3	9	13
Yes, would consider hoarding	5	1	0	6
Yes, already hoarding	4	0	0	4
<i>Total</i>	<i>10</i>	<i>4</i>	<i>9</i>	<i>23</i>

## 2.3 Influence of Exposure to Lighting Choices on Expected Actions

A substantial portion of the focus groups involved an actual demonstration of five different light bulbs, listed in Table 2–7, meant to replace the 60 Watt incandescent bulb.<sup>12</sup> The lighting demonstration had two related purposes: 1) to find out if exposure to different types of energy efficient bulbs altered prior opinions about those bulbs, and 2) to understand if participants who had been considering hoarding still planned to do so after the demonstration. The display included two covered CFLs in which the light appeared different despite similar color temperature specifications. Both bulbs were included in an effort to provide the Companies with information on how to help consumers choose light bulbs given continued challenges of consistent light quality and color temperature. We also showed a 60 Watt incandescent bulb so participants could compare more efficient choices to the generally accepted “normal” light bulb. We kept the lumen and Kelvin ratings as consistent as possible across bulbs.<sup>13</sup>

**Table 2–7: Bulbs Used in the Lighting Display**

Type	Manufacturer	Wattage	Lumens	Kelvins
Bulb A: Covered CFL	EcoSmart <sup>a</sup>	14	800	2,700
Bulb B: Covered CFL	General Electric	15	800	2,700
Bulb C: Spiral CFL	Sylvania	13	825	2,700
Bulb D: Halogen	Sylvania	43	785 <sup>b</sup>	2,700
Bulb E: LED	Phillips	12.5	800	2,700
Bulb F: Incandescent	Phillips <sup>c</sup>	60	830	2,700

<sup>a</sup> Home Depot store brand, manufactured by TCP.

<sup>b</sup> NMR searched for a 60 Watt-equivalent halogen with more lumens, but the only one we could find had clear glass, giving it a different appearance than all the others bulbs. The frosted bulb was selected as it was the most comparable to the 60 Watt incandescent and other bulbs in the display.

<sup>c</sup> This Phillips LED is currently being supported by the Companies’ lighting program. It has a yellow filter to give it soft white light appearance. Other LED choices lacked this filter but are not widely available nor are they supported by the lighting program.

After the moderator introduced the bulbs in the display, the participants viewed the bulbs for approximately 25 minutes, ranking them (*i.e.*, gave a one to the bulb they liked best and a five to the bulb they liked least) on the following characteristics:

- Brightness
- Yearly cost
- Life
- Ability to read a book (measure of brightness and light quality)

<sup>12</sup> [Appendix B](#) includes the labels we attached to the bulbs during the demonstration to describe them to the participants. These labels are based on the Lighting Facts label discussed in Section 2.4.1.

<sup>13</sup> The moderator also showed the participants a cool appearance CFL, as a 100 Watt equivalent CFL, and a 100 Watt equivalent halogen so they could see the variety of bulbs available. The demonstration focused on 60 Watt equivalents for two reasons: (1) 60 Watts are the most common incandescent in use, and (2) the greatest variety of bulbs available that are meant to replace a warm appearance, 60 Watt incandescents.

- Appearance of colors on fabric (color rendition)
- Appearance of skin tone (color rendition)
- Bulb appearance
- Price
- Overall preference rank based on whichever criteria the participant wanted

We selected these characteristics because they have been named frequently in prior studies and in the media as being among the factors consumers consider when assessing their level of satisfaction with light bulbs.<sup>14</sup> Two characteristics missing from this list were the time it takes bulbs to “warm up” or reach full brightness and the ability to dim bulbs. Unfortunately, the nature of the display did not allow for assessments of warm-up time and dimmability, but some focus group participants mentioned the issues among their concerns about CFLs.

### 2.3.1 Overall Preferences for Bulbs after Demonstration

Table 2–8 lists the post-demonstration preferences for each type of bulb by CFL user group, based on the number of participants giving each bulb a ranking of “number one.” It must be stressed that these rankings are not important in themselves, as the purpose of the group was not to find out what bulbs people liked the best but instead to find out if their opinions about bulbs and hoarding of incandescents had changed after viewing the demonstration. Still, understanding participants’ preferences provides necessary background for discussing the stability and change in opinions about the bulbs and hoarding before and after the demonstration.

For all three CFL user groups, the greatest number of participants selected covered CFL A as their favorite bulb overall. Moreover, covered CFL B received the second highest votes as the preferred bulb from low and high users and tied with other bulb types for second among moderate users. The preferences for covered CFLs were striking, not only because of their consistency across groups, but also because so many of the respondents had only learned about their existence during the focus groups. These findings provide strong evidence that greater exposure to covered CFLs would most likely boost their adoption and perhaps lead consumers wary of CFLs to try covered varieties instead of reaching for the less efficient halogen bulb. In the recommendations section, we offer some ideas on ways the Companies can increase consumer exposure to CFLs.

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<sup>14</sup> NMR Group. 2010. *The Market for CFLs in Connecticut*. See also Green, P. 2011. “Light Bulb Saving Time.” *New York Times* May 25, 2011. Available at <http://www.nytimes.com/2011/05/26/garden/fearing-the-phase-out-of-incandescent-bulbs.html?hpw=&pagewanted=all> (accessed November 2, 2011).

**Table 2–8: Overall Bulb Preferences**

Low Users <sup>a</sup>	Moderate Users	High Users <sup>b</sup>
Covered CFL A	Covered CFL A	Covered CFL A
Covered CFL B	Covered CFL B, Spiral CFL, Halogen (three-way tie)	Covered CFL B
Halogen	LED	LED
Spiral CFL		Spiral CFL and Halogen (tied)
LED		

<sup>a</sup> The number of low users preferring covered CFL A to covered CFL B differed by just one.

<sup>b</sup> No high users selected the spiral CFL or the halogen as their preferred bulb.

In contrast to covered CFLs, the LED bulb garnered the smallest number of number one rankings as the preferred bulb. Although the high price of the LED played a role, most participants explained that, for them, the deciding factors were the “yellowish light” it emitted and its physical appearance (*e.g.*, heavy base, yellow filters, *etc.*). NMR cautions that the yellow filter used on this particular LED to provide a soft white light most likely biased opinion against this bulb, and the use of alternative LEDs that achieve a low color temperature without a visible yellow filter might have produced different reactions.

In general, participants did not select the spiral CFL as their preferred bulb, although, as we discuss below, a few low users did admit to being pleasantly surprised by the brightness and light quality of the CFL used in the display. Still, it cannot be denied that the spiral CFLs ranked below both covered CFLs and halogens among low users and tied with halogens and covered CFL B among moderate users as the second most preferred bulb. Not a single high user choose the spiral CFL as the preferred bulb.

Another important finding revealed by the ranking exercise was that high users differ from moderate and low users in strength of their preferences for certain bulbs. In particular, one-half (50%) of the high users chose covered CFL A as the preferred bulb, compared to 27% of moderate users and 29% of low users. No high users preferred halogens or spiral CFLs even though at least some low and moderate users ranked these bulbs the highest. Unfortunately, the focus group discussions did not offer definitive explanations for why the high user group was more united in its preferences for or against certain bulb types after the demonstration.

Finally, the very short life of the halogen displeased most participants, leading them to prefer other bulbs—particularly covered CFLs—over the halogen. Yet, the few low and moderate use participants who preferred halogens tended to rank them highest for two reasons: 1) participants who had voiced a great deal of concern with the appearance of their skin tone under artificial light perceived the halogen as the most flattering, and 2) the halogen appeared “brighter” to those

who preferred it, despite the fact that the lumens ratings of the halogen was the lowest of all the bulbs in display. We cannot explain why they perceived the halogen to be the brightest bulb.<sup>15</sup>

### **2.3.2 Stability and Change in Lighting Opinions after the Demonstration**

The post-demonstration preferences for the bulbs as well as the discussion that followed the demonstration revealed that exposure to the different types of light bulbs had expanded the types of bulbs that participants would consider using in their homes.

The most obvious response to exposure to the different bulbs involves covered CFLs—participants in all three use groups really liked covered CFLs. Low to moderate users who had voiced dissatisfaction with CFLs over the appearance of the spiral and its fit with particular fixtures or shades typically selected covered CFLs as their favorite bulbs. These individuals often noted how pleased they were that they could choose an energy efficient bulb in a style they felt comfortable using in most applications. It was also the case, however, that committed spiral CFL users also preferred covered CFLs. One high user who had just learned about covered CFLs vowed to move to them over spirals when needing to replace existing bulbs. In fact, participants often asked the moderator who manufactured the covered CFLs and where they could buy them. In short, exposing the focus group participants to covered CFLs convinced quite a few participants, including those currently using many spirals, to try these energy efficient bulbs.

We found less evidence, however, that exposure to the different bulbs had changed existing strong opinions about spiral CFLs. Certainly, a few participants who previously thought they disliked spiral CFLs left feeling more favorably about spirals upon seeing the model used in the display. One of these individuals said, “I was surprised by how much I liked the spiral CFL, the brightness was great.” The more common reaction was for those who had disliked spiral CFLs for specific applications to persist in their dislike of spirals, but to have favorable opinions about covered CFLs. Moreover, the individuals who had strongly believed that spiral CFLs made their skin look sickly or green asserted in the post-demonstration discussion that they still felt that all three CFL bulbs, and the LED as well, did not flatter their skin tone. These individuals preferred halogens to all other bulb types.

In contrast to CFLs, participants’ opinions of LEDs worsened as result of the display, a finding most likely biased by the inclusion of the particular model with its yellow filter. No individuals went into the group with a negative opinion of A-shaped LEDs; most participants had simply never heard of them. Unfortunately, the majority of participants—including on high user who had previously been excited about the technology—left with a negative opinion of LEDs, voicing disappointment in its “yellowish light” and “ugly look.” A few users—those committed to savings energy or who wanted to limit how often they replaced bulbs—did chose the LED as their favorite bulb, but theirs was certainly a minority opinion.

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<sup>15</sup> The length of warm-up time for CFLs can be ruled out as an explanation due to the fact that the CFLs were “warmed up” by the time the participants actually examined the bulbs and filled in their rankings.

Participants were so enthusiastic about discussing the individual bulbs after the display that the conversation rarely returned to stockpiling incandescents. However, when it did, two patterns emerged. The handful of participants who still did not think that covered CFLs would meet all of their lighting needs or who believed the light from CFLs and LEDs did not flatter their skin tone persisted in saying they would hoard incandescent bulbs, at least to some extent and for certain sockets. More frequently, however, participants who had voiced reservations about spiral CFLs for certain fixtures or applications seemed more inclined to give covered CFLs a try than to engage in hoarding.

## **2.4 Information Needed to make Better Lighting Choices**

The moderator also led the focus groups in two discussions of what information they would need to make more informed lighting choices after the incandescent phase out begins. The first discussion focused on the federal “Lighting Facts” label that will be required on lighting packaging after the effective date of EISA. This discussion preceded the bulb demonstration, providing a glimpse of the degree to which the label may or may not help the average consumer make better lighting choices. The second discussion followed the bulb demonstration and sought to understand what the Companies could do to help consumers make better lighting choices after the incandescent phase out.

### **2.4.1 Initial Reactions to the Lighting Facts Label**

The moderator presented the lighting facts label (see [Appendix B](#) for examples of the label) to the focus group participants immediately after defining the key lighting terms discussed in Section 2.1.4. Therefore, it was not surprising that nearly all of the participants in each focus group found the label to be easy to understand. Yet, participants still had several questions and concerns that lighting facts label alone will not address.

Although they found the label easy to understand, participants indicated that this was the case only because the moderator had just defined the key terms used on it. Without the benefit of having the terms defined for them, participants believed that they would not have understood all the information on the label. “I didn’t know what a lumen was or what light appearance was until just now,” was a common sentiment. Likewise, participants also noted that the color appearance bar did not provide an indication of what “warm” or “cool” appearance meant, which they believed would confuse some consumers unfamiliar with that particular terminology.

Several participants further asserted that the label would only be useful as a means to compare the available bulbs against each other. A common sentiment was that “820 lumens does not mean anything to me in and of itself,” and participants stated that they would only find the label useful to compare lumens, life, or energy used in one bulb to another. Others also voiced the concern that, even if they compared, for example, a spiral CFL with 825 lumens and 13 Watts to a halogen with 785 lumens and 43 Watts, they still would have no idea how either bulb compared

to the lumens of the incandescent bulbs they were used to buying. They would not know what lumens would be needed to replace the old incandescent.

Some participants also argued that the average consumer is usually in a rush when purchasing light bulbs and may not have the time to look closely at the various aspects of the label, comparing it across the many bulb choices available on the shelf. They believed that they—and their fellow consumers—would simply grab the cheapest product or the one that looked the most similar to what they were used to without looking at the labels. This, however, is one of the statements that NMR believes reflects the participants' prior experience with purchasing bulbs and not what will actually happen after the incandescent phase out begins. After the phase out, it is likely that the grab and go approach to light bulb purchases will no longer be an option for many consumers, and they will have to take more time and consideration prior to their purchase than in the past. It is more likely that, as other focus group participants noted, the number of new bulbs entering the lighting market will overwhelm consumers, leading to frustration in deciding which bulb to buy, even with the aid of the label.

During their initial review of the label, a few participants independently noted that the use of an electricity rate of 11 cents per kWh and a bulb use of three hours a day did not accurately reflect the rates in Connecticut or the length of use of many bulbs in their homes. It was convenient, therefore, that the next topic of discussion involved asking participants whether they knew the average electricity rate in Connecticut, if they could easily estimate how much money they would pay each year based on their rate, and whether they would know how to figure out whether the bulb saves money over its lifetime.

Very few focus group participants were able to give an accurate estimate of the electricity rate in Connecticut, which stood at about 19 cents per kWh as the time of the groups. When told that the rate on the label was 11 cents, reflecting a national average, many participants knew that the Connecticut rate was higher, but did not know exactly what it was. After being told the actual average rate in Connecticut, a number of participants in all CFL use groups expressed contempt at what they felt was misleading information on the federal label, since 11 cents was not an accurate estimate of their rates. Other participants recognized that it would not be feasible to print utility-specific labels, particularly when rates change frequently.

Participants were split fairly evenly in their belief that they could estimate from the label how much money they would pay to *operate* each bulb, each year if they had access to their actual electricity rate. Most of the participants who believed they could calculate it also indicated that, in all likelihood, they would not actually perform the calculation when buying a bulb. Again, they argued that they, and other consumers, are typically in a hurry when buying bulbs and would not take the time to calculate the operating costs in the store.

When probed about estimating how much money or energy they would *save* from buying one bulb over another, most participants said they would not know how to calculate this and, moreover, they did not feel they needed to do so. Instead, those that provided responses to this question argued that, instead of calculating savings, they would compare the yearly energy cost

and pick the bulb with the lowest yearly energy cost, provided that the initial shelf price of the bulb was not too high. Knowing that one bulb used less energy than another was all the information they needed to select the bulb that would save them the most money and energy.

Finally, the moderator also asked questions about lifetime operating costs and energy savings, but participants in all six groups voiced little concern with considering, let alone calculating, the lifetime operating costs and savings. Most participants believed—whether rightly or wrongly—that a single light bulb—even many light bulbs—represented such a small part of their overall expenses that they would pay little attention to lifetime operating costs or savings. Again, participants expressed they would simply choose the bulb with the lowest annual operating cost, perhaps also paying attention to the life of the bulb (and price). A few participants also expressed doubt that the bulbs lasted as many hours or years as advertised and believed that the yearly cost was the only one they could trust.

#### **2.4.2 Usefulness of the Labels during the Lighting Demonstration**

As mentioned earlier, a mock-up of a lighting facts label had been attached to each bulb used in the lighting demonstration. Participants unanimously found the lighting facts label very useful in helping them compare and rank the bulbs. Many participants indicated that “without the labels I wouldn’t have a clue. I wouldn’t know how long they’re going to last, or how much they cost to run.” Participants frequently mentioned bulb life and estimated yearly energy cost as useful aspects in deciding which bulbs they preferred. Many participants agreed with one individual’s observation that “since the new bulbs are more expensive, things like life-span become much more important. I’m going to go for the one that lasts for 5 years over the one that lasts 0.9 years if the cost is comparable.” Another participant observed, “The life expectancy was nice to see. Knowing that, although the LED costs a lot, it would last 20 years made me think it could be a good option despite its price,” indicating not only a beneficial feeling toward the label, but also a perceptive insight that would not have been possible without it.

#### **2.4.3 Continued Gaps in Information Needed to Choose Bulbs**

The participants clearly appreciated the opportunity to compare bulbs in the lighting display and noted that exposure to the bulbs and their accompanying labels had provided them with extremely useful information that they would use to buy bulbs in the future. However, they noted that, without the benefit of the focus group display and discussion, they—and other consumers—would be left with many needs when trying to choose the right bulb after the incandescent phase out. The moderator also probed the participants to think about what the Companies could do to help them make better choices in the future. This section describes these perceived needs and suggestions to meet them.<sup>16</sup>

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<sup>16</sup> We also include some suggestions made earlier in the focus group discussion about the shortcomings of the lighting facts label but clarify in the text if this is the case. We exclude comments that have to do with changing the

One of the most common participant reactions to the lighting display was a sense of dismay and even anger that the five bulbs with the same 2,700 Kelvin color appearance and similar lumen ratings (between 785 and 830) could all look so different. This was true not only for the two covered CFLs, in which one looked “cooler” than the other (prompting one participant to ask the moderator why a cool bulb was included in the mix), but also of comparisons among spiral, halogen, and LED bulbs. In fact, the NMR agrees with the participants that the perceived color appearance and brightness varied more than we had expected based on the similar ratings. Many participants wondered how they would ever be able to choose a bulb they liked, since the type of information to be included on the lighting facts label and bulb packaging did not seem to go far enough in explaining how the bulb would look once installed in their home. When asked what the Companies could do to overcome this difficulty, many participants suggested lighting displays set up in the lighting aisles of stores. Although a few participants thought that the overhead lights at the store could “pollute” the light from individual bulbs, participants by and large believed a “light bar” would be better than no bulb comparison at all.

Another common concern involved the federal lighting facts label, and echoed a sentiment raised earlier in the focus groups—although the participants found the labels useful to help them compare and rank the bulbs used in the display, this usefulness depended on their understanding the terminology used on the label. In fact, prior to the group, many of the participants would not have known what “lumens” or “color appearance” meant, and they predicted that other consumers would also not be familiar with the terms. Therefore, the participants urged the Companies to educate their customers about the meaning of the new terminology predominantly through point of purchase (POP) materials; a few also mentioned newsletters sent with the bill and information on the website. Importantly, these materials would not just define the terminology but also link the terminology back to what they knew about incandescent bulbs. Specifically, the participants desired a display that explained the following:

- Lumens, not Watts, means light output
- Watts means energy used, and the greater the Watts the more it will cost to run the bulb
- Light output of the most common incandescent bulbs compared to the light output of each type of bulb meant to replace incandescents
- Explanation of color appearance in terms of what color light constitutes “warm” and “cool”

Participants also wanted more direct input from the electric company about which bulbs were the best for particular uses or most comparable to what the participant was used to. For example, participants desired suggestions from the electric company on the ideal use of different kinds of bulbs, a recommendation also made in reference to the lighting facts label, as participants felt they needed guidance on the best uses of particular bulbs (*e.g.*, indoor and outdoor usage,

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federal label, but instead highlight the needs that could potentially be addressed through the Companies via consumer education and outreach or energy efficiency programs.

reading, dining, or cooking, *etc.*). Some light bulb packaging and in-store displays list suggested uses based on light output and color temperature. NMR believes that it would make most sense for the Companies to let the manufacturers and retailers take the lead in developing such materials, as lighting preferences truly are a personal choice, and some consumers may not agree with the suggested use. The Companies most likely wish to avoid finding themselves in a situation in which their suggested use led to dissatisfied customers.

Focus group participants had mixed opinions about whether consumers would find information on how to convert the annual operating costs based on 11 cents per kWh to the average electricity rate in Connecticut. Participants favoring this idea thought the conversion would give consumers a more accurate estimate of what it would take to run the bulb in Connecticut. Others thought that the information on the label was sufficient to show which bulbs cost more or less to operate, which, to these participants, was more important than the exact cost to use the bulb each year.

Finally, prior to the bulb demonstration, participants showed little interest in being able to figure out or be shown the annual and lifetime savings or lifetime costs associated with the various bulbs. After viewing the wide ranges of initial bulb prices, operating costs, and expected measure lives during the demonstration, participants seemed more amenable to this idea, with their rankings and post-demonstration discussion showing that they implicitly—and sometimes explicitly—considered long-term operating costs and savings in their preferences.

### 3 Conclusions and Recommendations

The focus groups provided a great deal of insight into consumers current knowledge of changes soon coming to the lighting market, their initial reactions to the incandescent phase out, and the degree to which exposure to new information and bulb types changes those opinions and helps consumers select between light bulbs. NMR has drawn the following conclusions from the research and developed a series of recommendations on how the Companies may help their customers make better lighting choices after the incandescent phase out begins. We have organized the recommendations in relation to the objectives of the study, starting with the most important recommendations on helping consumers make better lighting choices after the incandescent phase-out begins and then turning to other recommendations resulting from the findings of the focus groups.

**Conclusion 1:** Although many participants had heard at least *something* about changes in lighting standards and the “banning” of certain light bulbs, only a few participants had an in-depth understanding of the legislation. Even fewer participants realized it would be phased in over time or that specialty bulbs would be exempt from the changes in efficiency standards.

**Recommendation 1:** To address misconceptions abound about the breadth and implications of the changes in lighting efficiency standards that EISA will bring in January 2012, the Companies should take part in efforts to educate consumers about the nature of the changes in standards and what these changes will mean to them. This educational effort should be paired with other efforts described here to inform consumers about the new lighting options available to them, understanding of the terms on the lighting facts label, and how to make better lighting choices in the post-EISA lighting market.

**Conclusion 2:** Focus group participants believed they needed more information than currently provided to help them choose light bulbs after the phase out. Although they thought the federal lighting facts label represented a step in the right direction for choosing bulbs maneuvering through the proliferation of alternative light bulbs in the marketplace, they voiced concern that the label was not sufficient for making the best bulb choice for their needs. They argued that most consumers would be unfamiliar with the terminology used on the label, would not take the time to compare bulbs, and would be most interested in knowing which Wattage of incandescent bulb the new bulb was meant to replace. Some participants also wanted information on operating costs and savings based on local electricity rates, not the national average rate.

**Recommendation 2a:** The Companies should consider developing POP materials that complement the lighting facts label. Materials that define the various lighting terms, compare the bulb to its equivalent incandescent, explain how much the bulb would cost to run based on the average Connecticut electricity rate, and display the lifetime operating cost of equivalent bulbs (including the incandescent bulb it is meant to replace) would alleviate these widespread participant concerns.

**Conclusion 3:** The lighting display demonstrated that bulbs rated similarly for lumens and color temperature—even bulbs using the same technology—may appear very different in practice. Participants found the inconsistency in brightness and color appearance frustrating, with many complaining that the federal label provided very little guidance on how the light from the bulb would actually appear when turned on. They worried that they would buy a bulb based on the label and then dislike the light it emitted once installing it in the home.

**Recommendation 3a:** The Companies should work with retailers to design lighting displays in the stores so consumers can see a side-by-side comparison of bulbs.

**Recommendation 3b:** It is our understanding that the Companies have taken part in community festivals and special promotional events in which they display efficient lighting choices. The findings from the focus groups suggest that they should continue these efforts in order to make consumers aware of the range of efficient lighting options available and promote their use.

**Recommendation 3c:** The Companies should continue to distribute energy efficient light bulbs through such direct-install programs as Home Energy Solutions (HES and HES-IE). If the programs do not already do so, the Companies should consider installing bulbs of different lumens, shapes, and color temperatures, ideally after discussing with the occupants how they use the space and the type of light they prefer for it. They may also want to consider guaranteeing the life of the bulb for a specific amount of time.

**Conclusion 4:** Prior to the focus group, many participants, even high CFL users, believed that they still could not use CFLs in all applications. They particularly noted that spiral CFLs do not look attractive in all fixture types and sometimes would not fit in fixtures with harps or lamp shades that clip onto the bulb. Most participants, moreover, had never seen a covered CFL prior to the focus group. After the lighting demonstration, covered CFLs emerged as the favorite bulbs among all CFL use groups, demonstrating that greater exposure to them would likely increase their adoption rate, particularly if the price is competitive with spiral CFLs or A-shaped halogens.

**Recommendation 4:** The Companies should more strongly promote covered CFLs in marketing materials and in-store POP materials, lighting displays, and direct install programs. These efforts should emphasize the types of fixtures and shades in which it is appropriate or advisable to use covered CFLs.

**Conclusion 5:** Nearly all focus group participants named price as one of the top three things they considered when purchasing light bulbs, and they did not believe this tendency would change after the implementation of EISA. However, during the lighting demonstration, participants did pay careful consideration not only to price but also to the annual operating costs and measure life of the bulbs. This suggests that price will remain important to consumers after the incandescent phase out begins, but that consumers will also begin to pay closer attention to how long a bulb lasts and how much it costs to operate in the post-EISA period.

**Recommendation 5:** The Companies should continue to support *covered* CFLs, ensuring that the incentives make covered CFLs price-competitive with, even if still somewhat higher than, A-shaped halogens. The focus groups also provide some justification for continued incentives for spiral CFLs in the early stages of the phase out, when at least some consumers will persist in their habit of automatically choosing the lowest price bulb. However, it is likely that, once consumers become savvier about considering operating costs and measure life as well as price, the Companies can remove their support for spirals and focus exclusively on covered (and possibly specialty) CFLs.

**Conclusion 6:** Most participants found the price of the LED, even when supported at the level it is today, to be too high for consideration when choosing a bulb. While this conclusion is certainly biased by participants' dislike of the particular LED used in the demonstration, the results suggest that the program should expect relatively low LED sales until the price, with or without incentives, drops.

**Recommendation 6:** If the Companies choose to continue supporting LEDs, they should consider targeting early adopters of energy efficient technology or those already predisposed to energy efficiency, such as participants in other CEEF programs. For example, the program could send coupons to prior CEEF participants, inviting them to buy a qualified LED at partner retailers.

**Conclusion 7:** Some focus groups participants argued that lighting represented such a small part of their overall expenses that they would not be willing to take the time to compare operating costs and savings when choosing bulbs in the store. In truth, in most homes not heated with electricity, lighting comprises a large portion of the annual electricity bill.

**Recommendation 7:** In order to help consumers make better lighting choices, the Companies should work to educate consumers through bill stuffers, marketing campaigns, and POP materials on the percentage of annual home electricity use attributable to lighting use.

**Conclusion 8:** Most participants strongly disliked the appearance of the LED used in the lighting demonstration. However, this bulb is currently being supported by the Companies—and other program administrators in the Northeast. It gets fairly good reviews on the website of a large home improvement store, but focus group participants rejected it as being ugly and argued that the light it emitted was too yellow. Importantly, the particular manufacturer uses a yellow filter to achieve a color appearance of 2,700 Kelvin, and this yellow filter likely underlies many of the negative responses to the LED. Furthermore, participants in all user groups voiced complaints that have persistently been raised about CFL quality—buzzing, long warm-up time, and dimmable CFLs not dimming correctly, among others.

**Recommendation 8:** When the Companies solicit bids for new agreements or memoranda of understanding with manufacturers and retailers to promote LEDs, they may want to include multiple models of A-shaped LEDs so that consumers can choose between those

with yellow filters and those without the filters. Moreover, for LEDs and CFLs, the companies should continue to support only those bulbs that meet stringent requirements for quality testing (*e.g.*, PEARL testing).

### **3.1 Concluding Thoughts**

EISA has not yet been implemented and consumers remain largely unaware of it. Right now, any predictions on how consumers and the market will react to EISA are, at best, educated guesses. Only time and careful monitoring of the market will reveal the true implications of EISA. NMR will continue to work with the EEB project manager to design studies that assess the lighting market as the incandescent phase out begins. We believe that monitoring the market over time will provide the best indication of the true impact that EISA has on consumer lighting choices.

## Appendix A: CT Lighting Focus Groups Screener

Hello, my name is \_\_\_\_\_ and I am calling from \_\_\_\_\_ on behalf of the Connecticut Energy Efficiency Fund with the cooperation of Connecticut Light and Power and The United Illuminating Company. We are conducting focus groups in your area about upcoming changes that may influence your household lighting choices. We are offering a \$100 incentive to focus group attendees to compensate them for their time. May I ask you a few short questions to see if you are eligible to participate in the focus groups?

**[IF NECESSARY, READ: THE CONNECTICUT ENERGY EFFICIENCY FUND IS SPONSORING THIS PROGRAM AND STUDY. THE CEEF CONTACT PERSON IS TIM COLE. IF YOU HAVE QUESTIONS, YOU CAN REACH HIM AT (860) 874-5813. IF YOU PREFER EMAIL, [CT\\_EEB@ATT.NET](mailto:CT_EEB@ATT.NET).**

S1. Have you taken part in any focus groups in the past 12 months?

1. Yes [THANK AND TERMINATE]
2. No [CONTINUE TO S2]
96. REFUSED [THANK AND TERMINATE]
97. DON'T KNOW [CONTINUE TO S2]

**AT THIS POINT, THE GUIDE WILL BE TAILORED TO EACH SITE DEPENDING ON WHETHER THEY WILL HOST LOW, MODERATE, OR HIGH USER GROUPS. FOR NOW, OUR PLANS ARE AS FOLLOWS:**

**STAMFORD: MODERATE- AND HIGH-USER GROUPS**  
**NEW HAVEN: LOW- AND HIGH-USER GROUPS**  
**HARTFORD: LOW- AND MODERATE-USER GROUPS**

S2. I'd like to ask you a few questions about your awareness of different types of light bulbs. Before this call today, had you ever heard of compact fluorescent light bulbs, or CFLs?

1. Yes [CONTINUE TO S4]
2. No [CONTINUE TO S3]
96. REFUSED [CONTINUE TO S3]
97. DON'T KNOW [CONTINUE TO S3]

S3. 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. Before today, were you familiar with CFLs?

1. Yes [CONTINUE TO S4]
2. No [QUALIFIES FOR LOW-USER GROUP, CONTINUE TO D1]
96. REFUSED [THANK AND TERMINATE]
97. DON'T KNOW [THANK AND TERMINATE]

- S4. Do you currently have CFLs installed anywhere in the interior or exterior of your home?
1. Yes [**CONTINUE TO S5**]
  2. No [**QUALIFIES FOR LOW-USER GROUP, CONTINUE TO D1**]
96. REFUSED [**THANK AND TERMINATE**]  
97. DON'T KNOW [**THANK AND TERMINATE**]
- S5. About how many CFLs do you currently have installed on the inside or outside of your home?
1. One to five [**QUALIFIES FOR LOW-USER GROUP, CONTINUE TO D1**]
  2. SIX TO 15 [**QUALIFIES FOR MODERATE USER GROUP, CONTINUE TO D1**]
  3. 15 OR MORE [**QUALIFIES FOR HIGH USER GROUP, CONTINUE TO D1**]
96. REFUSED [**THANK AND TERMINATE**]  
97. DON'T KNOW [**FIRST TIME, ENCOURAGE THEM TO GUESS; SECOND TIME THANK AND TERMINATE**]

**IN ADDITION TO MEETING CFL USER CRITERIA, WE ALSO WANT TO HAVE A MIX OF DEMOGRAPHICS. WE WILL CHANGE THESE CRITERIA FOR THE DIFFERENT LOCATIONS AND USER-GROUPS, AS NEEDED.**

- D1. [DO NOT READ] Sex
1. Female [**QUOTA=5-7**]
  2. Male [**QUOTA=5-7**]
- D2. What is your age? Are you . . .
1. Under 18 years of age [**THANK AND TERMINATE, NOT ELIGIBLE**]
  2. 18-35 years old [**QUOTA=2-3**]
  3. 35-54 [**QUOTA=5-7**]
  4. 55 years old or older [**QUOTA=3-4**]
  5. (Refused) [**THANK AND TERMINATE, NOT ELIGIBLE**]
- D3. In which of the following categories was your total household income in the year 2010? Was it . . .
1. Under \$60,000 [**QUOTA=2-4**]
  2. 60 – 89 thousand [**QUOTA=2-4**]
  3. 90-124 thousand [**QUOTA=3-5**]
  4. 125 thousand or more [**QUOTA=3-5**]
  5. (Refused) [**FIRST TIME, REASSURE THEM WE JUST NEED THE CATEGORY; SECOND TIME, THANK AND TERMINATE, NOT ELIGIBLE**]

IF RECRUITED, COLLECT NAME, PHONE NUMBER, ADDRESS; HAVE THEM SHOW UP 20 MINUTES EARLY TO EAT A LIGHT DINNER.

## Appendix B: CT Lighting Focus Groups Discussion Guide

While you wait, please be thinking of what you look for when buying a light bulb.

### Focus Group Introduction – 5 Minutes

#### Thank you for participating

- My name is Lisa and I'll be moderating tonight.
- We're all on a first name basis, and everything you say will be confidential beyond this session.
- Introductions – Name, town, occupation

Tonight's focus group is sponsored by The United Illuminating Company and Connecticut Light and Power (UI and CL&P). **We will discuss what you look for when purchasing light bulbs and changes that may soon affect your lighting choices.**

This focus group will last 90 minutes

- **There will be no breaks**
- **If you need to get up, please do so quietly**
- **[IF THE HOST HASN'T TOLD THEM] Bathroom is...**
- **We are being audio and video recorded**
- **Behind this mirror is an observation room and it includes [FILL IN NUMBER] observers from CL&P and/or UI who are interested in the kind of information you will provide tonight. They're interested in your feedback, and the mirror prevents us from being distracted by movement and noise from any observers.**
- **Feel free to write on the notepads in front of you if you want to use them.**

Let's review the focus group guidelines listed on the first page of your packet:

1. Please stay on topic so we can complete the focus group on time.
2. Please do not have side conversations. It is difficult to record side conversations, and they make it hard to hear the other speaker.
3. Please speak one at a time. Again, I have to write a report on what you all say, and I won't be able to hear if there are multiple voices at the same time. Use the notepads to write down any thoughts that you want to add to someone else's comments after they are finished speaking.
4. Please answer the questions that are asked. If you do not understand a question, just let me know.
5. We are interested in hearing all opinions—there are no right or wrong answers. So (respondent name), if you disagree with (other respondent name), please let us know—just keep it civil!
6. We will not use any names or otherwise identify individuals and their responses in the report.
7. Please turn off all cell phones.

**Please briefly state your name, the town where you live, and your occupation.**

**Current Lighting Use and Knowledge – 10 minutes**

To begin, can you tell me the top three things you look for when buying a light bulb? [GO AROUND THE ROOM]

What types of light bulbs do you currently have in your home? [GO AROUND THE ROOM; HOLDING UP BULBS OF DIFFERENT SHAPES AND GETTING A SHOW OF HANDS. MARK RESPONSES ON SEATING MAP. MAKE SURE NO ONE SEES THE BULBS PRIOR TO THIS SHOWING.]

Before I continue, I want to clear up a few terms. Can anyone tell me what a Watt is? [TAKE TWO OR THREE RESPONSES?] What about a lumen? Color temperature? Color rendition? [TAKE TWO OR THREE RESPONSES, IF ANY]

A Watt is a measure of electricity – how much energy something uses. A 100 Watt bulb uses 100 Watts of electricity. I'll bet lots of us grew up thinking that a Watt was how bright a bulb is – at least I did. But a lumen is a measure of how bright a bulb is. The average 100 Watt incandescent bulb produces 1,600 to 1,700 lumens of brightness. Color temperature refers to the appearance of a light – warm or cool – and is measured in Kelvins. Color rendition refers to how the colors look under the bulb compared to under natural sunlight.

[USE THIS AS A LEAD IN TO...]

**Lighting Facts Label – 15 minutes**

[HAND OUT MOCK LIGHTING FACTS LABEL FACE UP. TELL THEM NOT TO LOOK AT THE OTHER SIDE AT THIS TIME.]

This label, or one similar to it, has started to appear on light bulb packages across the nation [SHOW TWO PACKAGES]. It's meant to help you choose the right light bulb for your needs.

What does the label tell you? [TAKE A FEW RESPONSES WITHOUT PROMPTING, THEN]

Let's walk through the different parts of the label. [LUMENS, COST, LIFE, APPEARANCE, ENERGY USE; POINT OUT HOURS OF USE AND COST].

Do you find the label easy to understand? Do you think it gives you the type of information you need to choose a light bulb? If not, what information is missing from this label that might help you choose the right bulb to meet your needs?

Take a look at the "Estimated Yearly Energy Cost". It's based on an electricity rate of 11 cents per kWh. Do you know the average electricity rate in Connecticut? It's just under 19 cents per Watt. Do you think you could easily estimate how much money you'd pay each year by using this bulb, assuming a rate of 19 cents and using the bulb for three hours a day? [ANSWER IS ~\$12.50]

Do you think you'd know how to figure out whether the bulb saves you money over its lifetime? How would you compare costs and savings of two different kinds of bulbs? [COMPARE HOW MUCH IT COSTS TO RUN PER YEAR

### **Upcoming Changes to the Lighting Market – 15 minutes**

Have you heard or read any information concerning upcoming changes in lighting standards from the federal government that have to do with incandescent light bulbs? [TO THOSE WHO HAVE HEARD] What you have heard?

[The Energy Independence and Security Act establishes higher minimum efficiency levels for screw-in bulbs. These changes will begin on January 1, 2012. While it will take some time for stores to run out of their current stock of bulbs, sometime next year, you will no longer be able to buy 100 Watt incandescent light bulbs and over the next few years 75, 60, and 40 Watt bulbs will be mainly phased out as well. Instead, there will be a wide variety of bulbs available that will be more energy efficient than incandescents. The changes do not apply to specialty bulbs like three-way and spot lights.]

What do you think about this? [GO AROUND THE ROOM]

Based on what you know right now, what kind of light bulbs do you think you will buy after this change occurs? Will the things you consider when choosing which bulbs to buy be any different than those you named at the beginning of this focus group?

[IF NO ONE VOLUNTEERS: Do you think you'll go out and buy a bunch of incandescents now to make sure you have a stockpile to use after they are no longer available? Or do you know what you'd buy instead?]

**Lighting Options - 45 minutes**

Now, let's take a look at some different light bulbs. What I have here are six different light bulbs. Each has a Lighting Facts Label similar to the one we looked at earlier.

[NOTE THAT THE EXACT PROCEDURE HERE WILL DEPEND ON THE LAYOUT OF THE ROOM. HAVE PROPS TO HOLD UP TO THE BULBS – BOOK/NEWSPAPER, FABRIC SWATCHES. OBSERVERS IN BACK ROOM MAKE SURE ALL LIGHTS ARE OFF. MODERATOR: MAKE SURE AT LEAST ONE BULB IS ON AT ALL TIMES.]

This is a 60 Watt incandescent bulb with a warm appearance [TURN IT ON]. Around the room, you'll find bulbs meant to replace the 60 Watt incandescent once it is phased out in a few years. [INTRODUCE EACH BULB, TURNING IT ON AS YOU DO] Now, the 60 Watt bulb is very common but not very good for purposes that need a bright light. I want you to know that there are brighter versions of most of these bulbs meant to replace 75 Watt or 100 Watt incandescents. Here is a CFL and a Halogen bulb meant to replace 100 Watt incandescents. Also light bulbs come in both warm and cool colors. Our display here is all warm colors so that the bulbs are easier to compare. But there is what a cool 60-Watt equivalent CFL looks like – it's supposed to mimic natural daylight. For our purposes today, we're just going to look at the 60-Watt, warm color replacements, as there are more options to choose from [THE 100 WATT EQUIVALENTS AND THE COOL BULB WILL BE TURNED OFF AND STORED. EXPLAIN THAT WE COULD ONLY USE A LIMITED RANGE OF BULBS IN OUR DISPLAY BUT THERE WILL BE OTHERS (BRIGHTER, LESS BRIGHT; SPECIALTY BULBS THAT CAN BE USED IN REGULAR SOCKETS, ETC) THAT THEY COULD CHOOSE AS WELL. BUT WE HAD TO LIMIT OPTIONS FOR THE FOCUS GROUP.]

Please flip over the paper I handed out earlier and look at the form on the other side of the page. I'd like you to take turns looking at the various bulbs. Hold the book up to them, the fabric, your own hands. See how each looks under the different bulbs. Read the labels to learn more about the bulbs. Then, fill out this form and hand it back into me when you're done. [GO OVER THE FORM] We have about 20 minutes for you to do this. Let me know if you have questions.

[ASK THEM TO HAND BACK THE COMPLETED FORM. FOR THE QUESTIONS BELOW, GIVE EVERYONE A CHANCE TO RESPOND THAT WANTS TO, BUT CALL ON INDIVIDUALS TO TRY TO FOCUS THE CONVERSATION AND NOT LET IT DRAG ON TOO LONG]

What did you think about the different types of bulbs? Did these side-by-side comparisons change your opinions about any of the bulbs? How? If you were trying to choose between two bulbs, how would you figure out which one to buy? Did the labels help you understand the differences in the bulbs, or were the labels not helpful? What other information could the label have to help you choose a bulb? Apart from the label, what else would you want to know about

the bulbs to help you choose one? If your electric company was going to do one thing to help you chose bulbs when the lighting standards change, what would that one thing be?

[SPECIFICALLY PROBE ABOUT CFLS] [CALL ON INDIVIDUALS] You mentioned earlier that you didn't like CFLs? Do you still feel that way? Why or why not? How did you rate the spiral CFL on the display? The covered CFL?

[LED PROBING]. [IF ANYONE GAVE TOP PREFERENCE TO LEDS, ASK THEM WHY?, THEN...] LEDs are a newer technology for home lighting; because of this, they are still rather expensive. However, the price is expected to fall over the next few years. How would you decide if an LED was worth the higher upfront cost? Ignoring costs, do you like the light quality and look of an LED? Is this a bulb you would consider buying at the current cost? When the price goes down? Why or why not?

Thank you for sharing your opinions and taking the time to participate; your input is greatly appreciated. And don't forget to pick up your check on your way out! Maybe you can use it to buy some new light bulbs.

**DO NOT TURN THE PAGE OVER UNTIL INSTRUCTED**

**Example of a Lighting Facts Label**

<b>Lighting Facts</b> Per Bulb	
<b>Brightness</b>	<b>820 lumens</b>
<b>Estimated Yearly Energy Cost \$7.23</b> Based on 3 hrs/day, 11¢/kWh Cost depends on rates and use	
<b>Life</b>	<b>1.4 years</b>
<b>Light Appearance</b>	
Warm  Cool	
2700 K	
<b>Energy Used</b>	<b>60 watts</b>

Source: <http://www.ftc.gov/opa/2010/06/lightbulbs.shtm>

**Lighting Options Form**

For each characteristic, rank the **replacement bulbs** (not the incandescent – Bulb E) from one to four, with one being the best and five being the worst. Use each number once and only once in each row. The first row gives an example. For the overall preference, rank the bulbs on **whichever reasons you choose, even if they are not listed in this form.** Use the space below the form to explain your overall preference and to make any notes.

<b>Characteristic</b>	<i>A Covered CFL</i>	<i>B Covered CFL</i>	<i>C Spiral CFL</i>	<i>D Halogen</i>	<i>E LED</i>
<i>Example</i>	2	4	5	3	1
Brightness					
Yearly Cost					
Life					
Ability to read book					
Appearance of colors on fabric					
Appearance of skin tone					
Bulb Appearance					
Price					
Overall Preference Rank					

**REASONS FOR YOUR OVERALL CHOICE AND NOTES**

### Bulb A – Covered CFL

Price: \$1.50 to \$8.00 per bulb

<b>Lighting Facts</b> Per Bulb	
<b>Brightness</b>	<b>800 lumens</b>
<b>Estimated Yearly Energy Cost \$1.69</b> Based on 3 hrs/day, 11 c/kWh Cost depends on rates and use	
<b>Life</b>	<b>7.0 years</b> Based on 3 hrs/day
<b>Light Appearance</b>	
Warm	Cool
 2700 K	
<b>Energy Used</b>	<b>14 Watts</b>

### Bulb B – Covered CFL

Price: \$1.50 to \$8.00 per bulb

<b>Lighting Facts</b> Per Bulb	
<b>Brightness</b>	<b>800 lumens</b>
<b>Estimated Yearly Energy Cost \$1.85</b> Based on 3 hrs/day, 11 c/kWh Cost depends on rates and use	
<b>Life</b>	<b>7.3 years</b> Based on 3 hrs/day
<b>Light Appearance</b>	
Warm	Cool
 2700 K	
<b>Energy Used</b>	<b>15 Watts</b>

### Bulb C – Spiral CFL

Price: \$1.50 to \$3.00 per bulb

<b>Lighting Facts</b> Per Bulb	
<b>Brightness</b>	<b>825 lumens</b>
<b>Estimated Yearly Energy Cost \$1.57</b> Based on 3 hrs/day, 11 c/kWh Cost depends on rates and use	
<b>Life</b>	<b>11.0 years</b>
Based on 3 hrs/day	
<b>Light Appearance</b>	
Warm	Cool
2700 K	
<b>Energy Used</b>	<b>13 Watts</b>

### Bulb D – Halogen

Price: \$1.50 to \$3.00 per bulb

<b>Lighting Facts</b> Per Bulb	
<b>Brightness</b>	<b>785 lumens</b>
<b>Estimated Yearly Energy Cost \$5.18</b> Based on 3 hrs/day, 11 c/kWh Cost depends on rates and use	
<b>Life</b>	<b>0.9 years</b>
Based on 3 hrs/day	
<b>Light Appearance</b>	
Warm	Cool
2700 K	
<b>Energy Used</b>	<b>43 Watts</b>

### Bulb E – Light Emitting Diode (LED)

Price: \$20.00 to \$40.00 per bulb

<b>Lighting Facts</b> Per Bulb	
<b>Brightness</b>	<b>800 lumens</b>
<b>Estimated Yearly Energy Cost \$1.51</b> Based on 3 hrs/day, 11 c/kWh Cost depends on rates and use	
<b>Life</b>	<b>22.8 years</b>
Based on 3 hrs/day	
<b>Light Appearance</b>	
Warm	Cool
2700 K	
<b>Energy Used</b>	<b>12.5 Watts</b>

### Bulb F – Incandescent

Price: \$0.50 to \$1.50 per bulb

<b>Lighting Facts</b> Per Bulb	
<b>Brightness</b>	<b>830 lumens</b>
<b>Estimated Yearly Energy Cost \$7.23</b> Based on 3 hrs/day, 11 c/kWh Cost depends on rates and use	
<b>Life</b>	<b>1.4 years</b>
Based on 3 hrs/day	
<b>Light Appearance</b>	
Warm	Cool
2700 K	
<b>Energy Used</b>	<b>60 Watts</b>