
# Massachusetts Upstream Lighting Program Net-to-Gross Ratio Estimates Using Supplier Self-Report Methodology

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**Prepared for:**

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Part of the Residential Evaluation Program Area

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# Executive Summary

This report presents our estimates of net-to-gross (NTG) ratios for CFL and LED bulbs sold through the Massachusetts ENERGY STAR upstream lighting program in 2013 using the supplier self-report methodology. The first of several NTG estimates, these rely on different and complementary methodologies the Residential Evaluation Team is developing on behalf of the Massachusetts Program Administrators (PAs) and Energy Efficiency Advisory Council (EEAC) consultants. The other three approaches include a demand elasticity model, point-of-sale data analysis, and purchase estimates from comparison areas. Our evaluation team will develop an aggregated NTG ratio estimate that will be informed by these four methodologies.

We derived the NTG ratios in this report from responses to in-depth interviews and computer-aided telephone interview (CATI) surveys with various market actors participating in the 2013 program. We collected and synthesized NTG estimates from the following:

- 14 lighting manufacturers (which accounted for 86% of 2013 program bulb sales);
- Four buyers of lighting products for large national or regional retailers participating in the program; and
- 224 managers of stores selling lighting products through the program.

The NTG estimates we collected from lighting manufacturers together accounted for 71% of program sales (in some cases respondents did not provide or were not asked to provide estimates for all of their bulb sales).[1] Store managers had a higher number of NTG estimators (*i.e.*, respondents providing an estimate) than the other market actors, but the cumulative amount of program sales represented by these estimators ranged from 11% to 19%, depending on bulb types. The four retail buyers from which we could collect NTG estimates accounted for 3% to 34% of program sales, again depending on bulb types.

Table 1 shows NTG ratios estimated for each bulb type sold through the program. We calculated separate NTG estimates for bulbs sold through stores characterized as hard-to-reach (HTR) and through stores not characterized as such. HTR-designated stores included the vast majority of stores making up the “discount” channel (such as dollar stores), ethnic grocery stores, and a few home improvement stores targeting low-income citizens.

While we aggregated to the bulb level and store type, this report also shows bulb-type NTG ratios broken down by retail channel.

[1] For example, if a lighting manufacturer supplied program-discounted bulbs through multiple retail channels, to reduce respondent fatigue, the interviewers were instructed to collect NTG estimates only for those retail channels had the highest volume of program-discounted bulbs.

**Table 1. NTG Ratios for Each Bulb Type Sold Through 2013 Program***

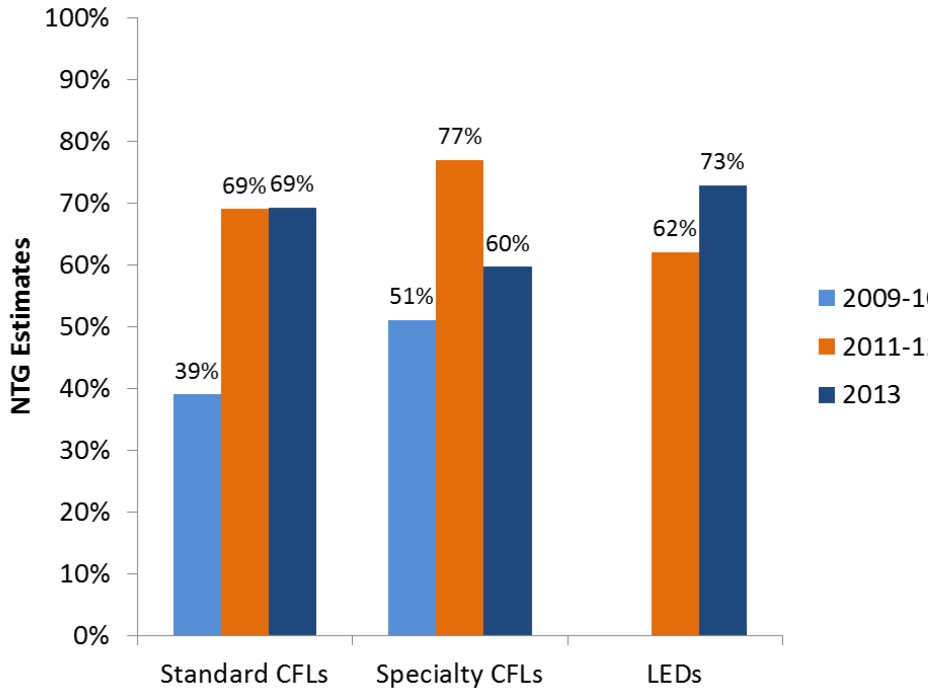
| Bulb Type | Total Bulbs Sold | NTG Ratio |
|---|---|---|
| **Standard CFLs** | | |
| Non-HTR | 1,851,587 | 58% |
| HTR | 918,409 | 95% |
| **Total** | **2,769,996** | **70%** |
| **Specialty CFLs** | | |
| Non-HTR | 1,303,795 | 58% |
| HTR | 361,320 | 99% |
| **Total** | **1,665,115** | **67%** |
| **LEDs** | | |
| All LEDs | 508,085 | 75% |

The bulb counts here differ from those reported by the PAs for reasons discussed in Appendix A. The biggest reason for the discrepancy was that there were a large number of shipments in the program tracking data (~1.5 million bulbs) that did not identify the retailer. We dropped these observations because we need a retailer name to be able to assign the bulbs to a retail channel for use in the sales weights.

Figure 1 compares NTG ratios we calculated for 2013 program participants (with HTR and non-HTR bulbs combined) with those we calculated for previous program years, using the same supplier self-report methodology. While the 2009–2010 and 2013 estimates included NTG estimates from all three market actor levels (*e.g.*, manufacturers, retail buyers, and store managers), the 2011–2012 estimates only included estimates from store managers.[2]

[2] To allow consistent comparability across the years in this graphic, the 2013 NTG ratios here do not include the "other" category of program lighting sales (which included handouts of light bulbs at community events, schools, office buildings, malls, etc.).

**Figure 1. Supplier Self-Report Methodology: NTG Estimates for Each Bulb Type, by Participation Year**




Note: The 2013 NTG ratios in this figure are different than the ones in Table 1 because we excluded the "other" channel to allow a more consistent comparison across program years.

The chart shows much higher NTG ratios for the 2013 program year than those in the 2009–2010 program year — the last program year when NTG ratios were based on estimates from all three market actors levels of the lighting supply chain. Considering Massachusetts energy-efficiency programs have promoted CFLs since the late 1990s, it may appear surprising that market actors still estimate CFL sales would decline by 60-70% in the program's absence.

Two explanations most likely address the higher NTG ratios over time:

- First, as DNV GL discussed in evaluating the 2011–2012 program, EISA-compliant halogens entered the market in recent years. These bulbs present a lower-cost competitor to CFLs that closely resembles the incandescent bulbs many consumers remain comfortable with, but were marketed as energy-efficient bulbs (in comparison to incandescents).

  Some manufacturers selling CFLs in the Massachusetts and California residential lighting markets have recently pointed to California as a "cautionary tale" for what would happen in the Massachusetts lighting market if the Massachusetts program eliminated or significantly reduced CFL discounts. After California mostly eliminated discounts for standard CFLs, some major suppliers to the California market have reported that EISA-compliant halogens gained a significant market share at the expense of the CFLs, which rose to a higher price point in the absence of program discounts. DNV GL is currently conducting a new round of lighting shelf surveys in California to try to verify these claims. [3]

- Second, over time, the Massachusetts program has shifted greater volumes of bulb shipments from "big box" retail channels—such as large home improvement stores (*e.g.*, Home Depot), mass merchandise (*e.g.,* Walmart), and membership clubs (*e.g.*, Costco)—to HTR lighting markets, such as discount and ethnic grocery retail markets.[4] As the supplier self-report method weighted the program's overall NTG ratio based on program sales, the higher volume of bulbs sold through the HTR channels effectively increased the program's overall NTG ratio. Within the discount channel itself, the Massachusetts program also experienced shifts in volumes towards more dollar/99 cent stores and charity store chains (*e.g.*, Goodwill, Salvation Army), which have further increased NTG ratios within this channel.

Table 2 and Table 3 show the major shifts in program shares for standard and specialty CFLs between the 2009–2010 and 2013 program years. Standard CFLs more than tripled their program shares in the discount channel over this period, while specialty CFLs about doubled their program shares in this channel. The tables also show large differences in NTG ratios between discount channels and big box channels.

[3] The Massachusetts Point-of-Sale (POS) Modeling Research study has collected some POS data indicating that the market share of halogen bulbs in California has increased sharply while the market share of CFLs has declined. More details on this can be found in POS Modeling Research report.

[4] While the 2013 program shipped most bulbs it designated as "HTR bulbs" through the discount channel, it also sold these bulbs through other channels. For example, the 2013 program sold the following percentages for HTR standard CFLs: 72% through the discount channel; 21% through the "other" channel (including distribution of bulbs through cultural advocacy organizations and cultural events); 7% through the grocery channel; and a very small quantity (less than 1%) through the mass merchandise channel. Stores in the grocery and mass merchandise channels may be designated as selling HTR bulbs if they predominantly serve particular ethnic or low-income communities. Comments from the PAs on the draft version of this report also indicated that the lower percentage of program sales through Big Box stores in 2013 was also an effect of the program reducing program sales to some of its big box retail partners in order for them to participate in the market lift pilot program.

**Table 2. Program Share of Standard CFLs in Discount and Big Box Channels, 2009–2010 vs. 2013**

| Retail Channel | 2009–2010 | | 2013 | |
|---|---|---|---|---|
| | Percent of Program Sales | NTG Estimate | Percent of Program Sales | NTG Estimate |
| Discount | 9% | 72% | 30% | 93% |
| Big Box (Home Improvement, Mass Merchandise, Membership Club) | 61% | 33% | 52% | 56% |

Note: The "percent of program sales" estimates exclude the "other" retail channel.

**Table 3. Program Share of Specialty CFLs in Discount and Big Box Channels, 2009–2010 vs. 2013**

| Retail Channel | 2009–2010 | | 2013 | |
|---|---|---|---|---|
| | Percent of Program Sales | NTG Estimate | Percent of Program Sales | NTG Estimate |
| Discount | 14% | 79% | 27% | 99% |
| Big Box (Home Improvement, Mass Merchandise, Membership Club) | 75% | 47% | 62% | 41% |

Note: The "percent of program sales" estimates exclude the "other" retail channel.

The 2009–2010 NTG estimate did not include LED sales to compare to the 2013 NTG estimate for LED sales (and only store managers provided the 2011–2012 estimate). Comments from market actors, however, indicated that while LED prices fell somewhat, they remained high in comparison to other bulb types; therefore, program discounts remain important.

In reviewing a draft version of this report, one commenter expressed surprise that the NTG ratios for specialty CFLs in 2013 were slightly lower than those for standard CFLs. However, there are a few factors that might explain this including:

1) *Standard CFLs facing competition from EISA-compliant halogens.* As mentioned above, some lighting suppliers view the program discounts as important for keeping CFLs cost competitive with EISA-compliant halogen bulbs. Because most of the EISA-compliant halogens being sold offer no special functionality, they are less likely to compete with specialty CFLs that offer enhanced performance features such as dimmability, three-way capability, etc. However, they are direct competitors with standards CFLs as well as some specialty A-lamps.
2) *Demand for specialty CFLs has been shown to be more inelastic than demand for standard CFLs.* A 2011 study of the 2010 Massachusetts ENERGY STAR lighting program found that consumer demand for specialty CFLs was more inelastic than it was for standard CFLs. Such inelastic demand would at least partially explain a lower NTG ratio for specialty CFLs compared to

standard CFLs since specialty CFLs customers would be less likely to change their purchasing behavior if the program discounts went away.[5]

3) *Specialty CFLs are becoming a more familiar technology.* While specialty CFLs are certainly newer than standard CFLs, they have been commonly available in retail stores long enough where most customer unfamiliarity barriers have likely been overcome.

4) *The Massachusetts program sold a higher percentage of specialty CFLs through big box stores.* As shown above, a higher percentage (62%) of the specialty CFLs in the 2013 Massachusetts program were sold through big box retailers compared to standard CFLs (52%). Home improvement stores account for a large percentage of these lighting sales through big box stores. One explanation for the lower NTG ratios for specialty CFLs in the home improvement channel is that home improvement stores traditionally serve as "destination stores" for lighting purchases. For example, if a customer makes a special trip to a home improvement store with the intention of buying a specialty bulb, they are unlikely to walk away from these bulbs simply due to prices being higher than they would prefer. However, higher prices would more likely deter them in other shopping environments (e.g., discount or grocery stores), where lighting purchase decisions tend to be more of an "impulse buy."

In addition to providing NTG ratios for each bulb type at the program level, we calculated NTG ratios for each program at the retail channel level. Figure 2 through Figure 6 show great variability for NTG ratios by channel for non-HTR CFLs and LEDs, with consistently high NTG ratios among channels for HTR CFLs. This report's detailed findings section provides more information regarding how we calculated these channel-specific NTG ratios.

[5] "One of the more unexpected conclusions from this evaluation is the fairly consistent finding that consumers are more sensitive to the price of spiral CFLs than they are to the price of specialty CFLs. Price elasticity, realization rates, and NTG ratios are all lower for specialty CFLs than they are for spiral CFLs. Put another way, consumers appear willing to buy specialty CFLs at a fairly high price point. This situation is likely due to the early stage of the specialty CFL adoption/diffusion cycle, lack of consumer familiarity with what constitutes a —fair price for specialty CFLs, and the overall higher prices of specialties compared to spirals. Earlier, we suggested that lower realization rates for specialty products may reflect retailers and manufacturers noticing the inelastic prices of specialty CFLs and retaining more of the incentive for themselves than they do for spiral CFLs." (Massachusetts ENERGY STAR® Lighting Program: 2010 Annual Report, Volume 1; Submitted by: NMR Group, Inc., KEMA, Cadmus Group, Inc., Tetra Tech; Submitted to Energy Efficiency Advisory Council Consultants, Cape Light Compact, NSTAR, National Grid, Unitil, Western Massachusetts Electric; June 13, 2011; p. 72).

**Figure 2. NTG Ratios from Supplier Interviews for Non-HTR Standard CFLs by Channel**

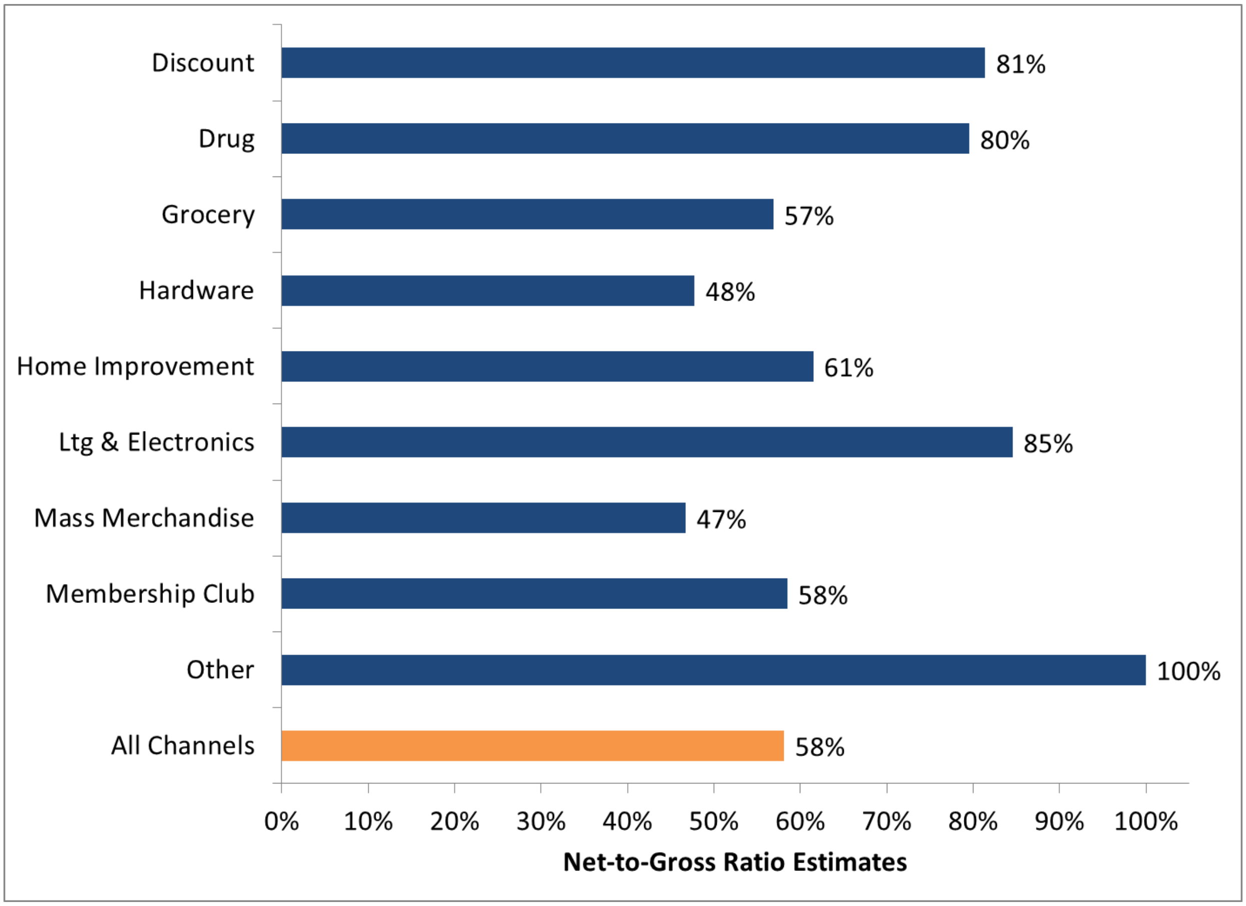


**Figure 3. NTG Ratios from Supplier Interviews for HTR Standard CFLs by Channel**

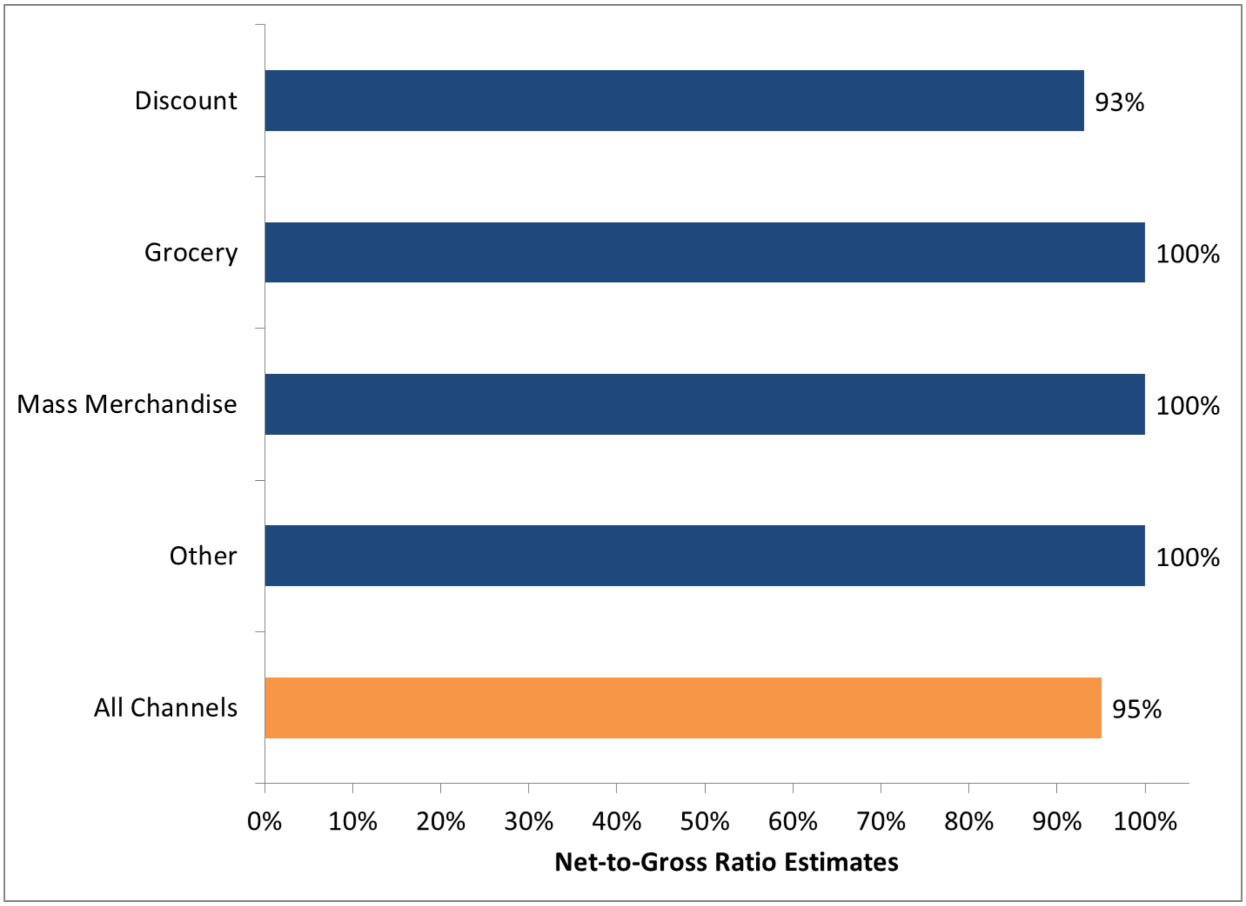


Figure 4. NTG Ratios from Supplier Interviews for Non-HTR Specialty CFLs by Channel

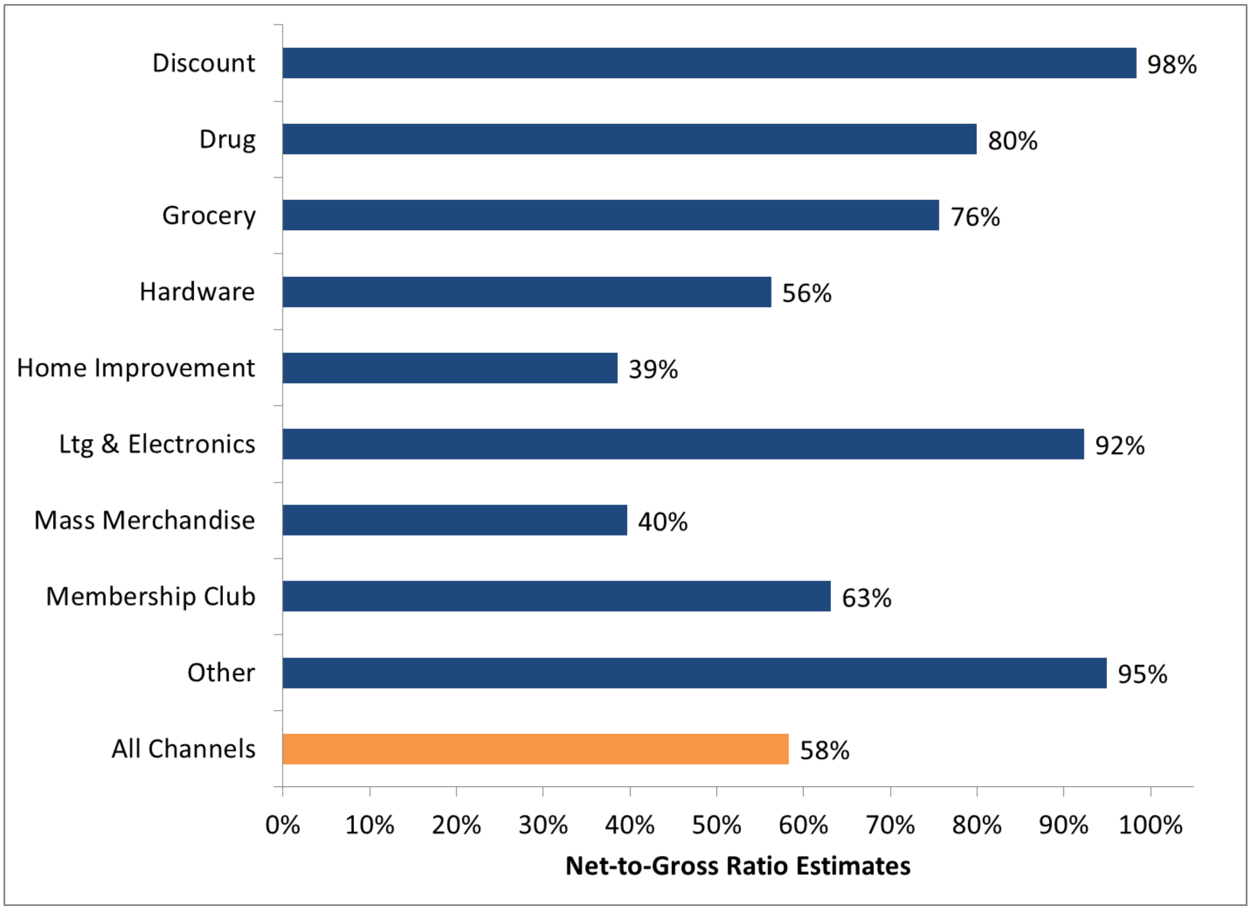


**Figure 5. NTG Ratios from Supplier Interviews for HTR Specialty CFLs by Channel**

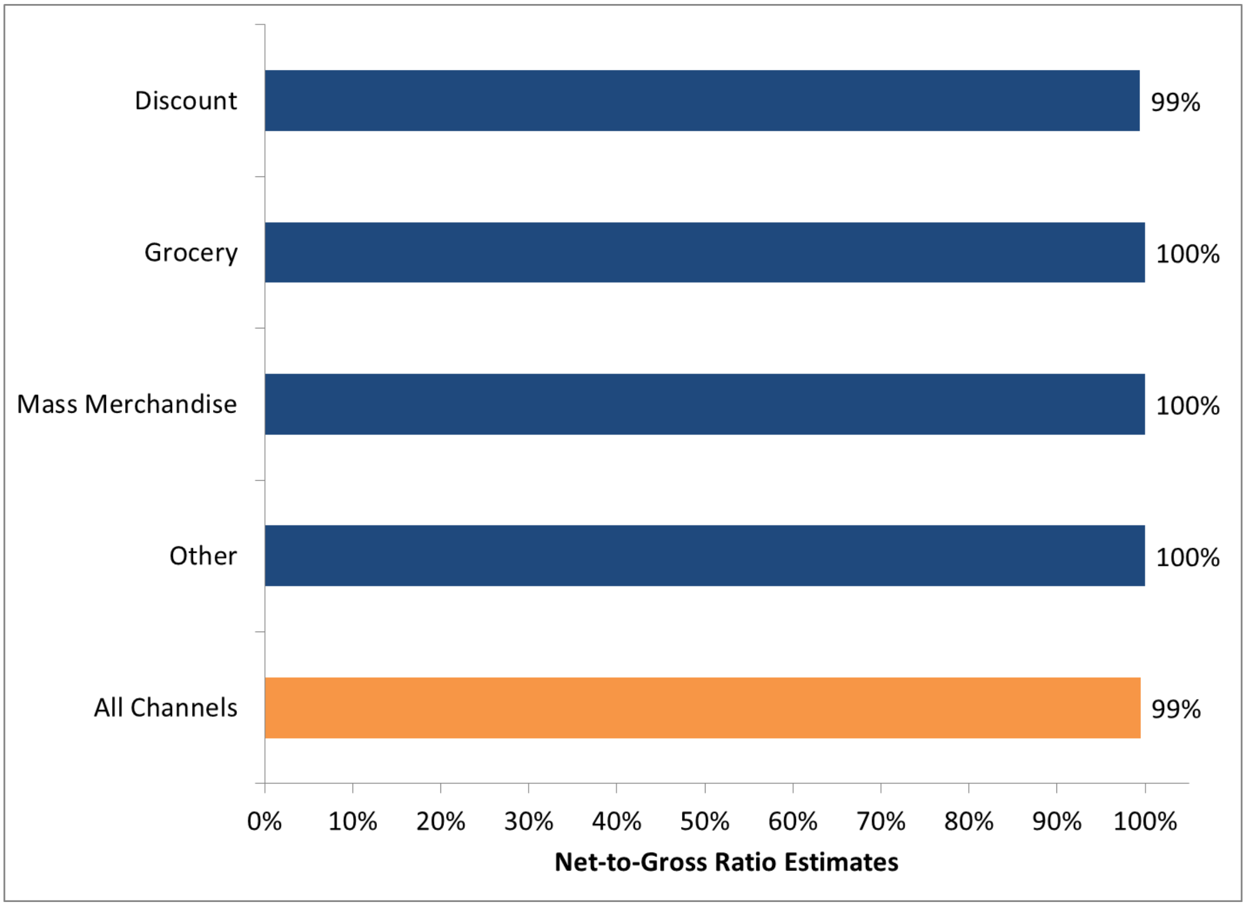
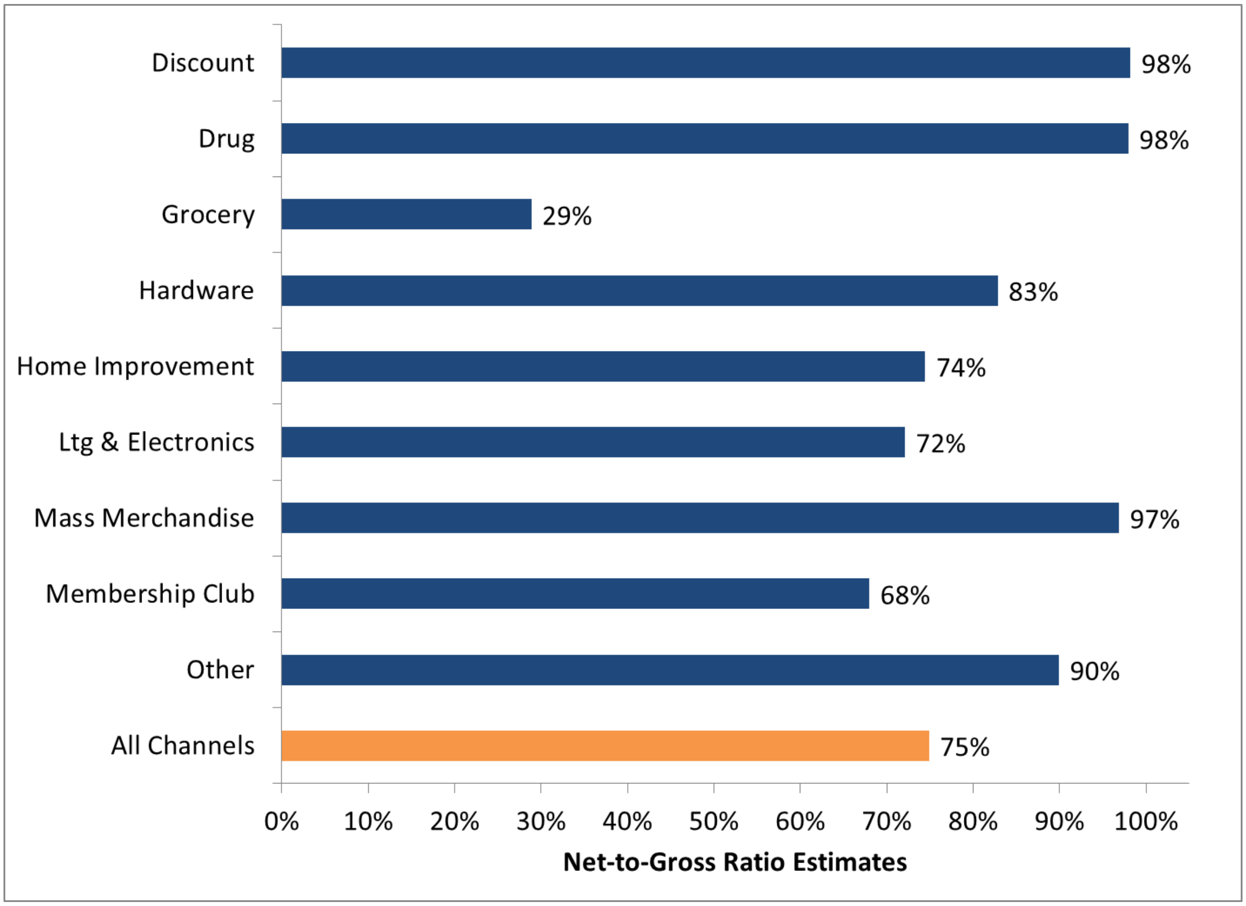


**Figure 6. NTG Ratios from Supplier Interviews for LEDs by Channel**




In March 2015 some of the PA representatives requested that the evaluation team add some NTG ratios to the report which were calculated at the retail channel grouping level. They requested these new NTG ratio calculations to assist them in future program planning efforts. The idea was to have NTG ratios that were more granular than the program level NTG ratios but less granular than the retail channel where the sample of NTG estimates is very small for some channels. The channel groupings were as follows:

- *Home Improvement:* This grouping included all non-HTR standard CFLs sold in the home improvement channel
- *HTR:* This grouping included all HTR standard CFLs plus non-HTR standard CFLs sold through the discount channel
- *All Other:* This grouping included all non-HTR standard CFLs except those sold in the home improvement or discount channels

Table 4 shows the NTG ratio estimates at the channel grouping level for standard CFLs (similar tables for specialty CFLs and LEDs can be found in the main body of the report). [6]

**Table 4. Channel Grouping NTG Ratio Estimates for Standard CFLs Sold through the 2013 Program**

| Lighting Retail Channel Grouping | Bulb Sales in Channel Grouping | Number of Unique Estimates | Recommended NTG |
|---|---|---|---|
| Home Improvement | 468,301 | 12 | 61% |
| HTR | 942,473 | 13 | 93% |
| All Other | 1,359,222 | 101 | 53% |
| **All Channel Groupings** | **2,769,996** | **126** | **68%** |

As with all NTG-estimation methodologies, the market actor self-report methodology presents limitations, some of which concern possible biases that lighting market actors might have and which may cause them to provide NTG estimates higher or lower than what would be the case without these biases. Other limitations concern certain market actors' possible knowledge gaps regarding the market. These threats to validity are discussed in detail below in the methodology section.

[6] The NTG estimates labeled "All Channel Groupings" for standard CFLs, specialty CFLs, and LEDs are slightly different than those presented in Table 1. This is because, using the supplier self-report methodology, aggregated NTG estimates vary based on the way that different channels (and thus individual estimates) are grouped together.

# Introduction

This report presents the Residential Evaluation Team's estimates of net-to-gross (NTG) ratios for CFL and LED bulbs sold through the Massachusetts ENERGY STAR upstream lighting program in 2013 using the supplier self-report methodology. We calculated these NTG ratios using responses to in-depth interviews and computer-aided telephone interview (CATI) surveys, which DNV GL and its subcontractors conducted with market actors that participated in the Massachusetts program. These market actors included the following:

- 14 lighting manufacturers and suppliers, which accounted for over 86% of sales by manufacturers identified in the program tracking databases;
- Four high-level lighting buyers, representing large national or regional retailers in the program, accounting for over 26% of the program sales; and
- 224 managers of stores selling lighting products through the program, 79 from HTR-designated stores (explained in the next section).

We completed the in-depth interviews with lighting manufacturers and high-level retailer buyers from May to July 2014 and the store manager CATI surveys from June to July 2014.

Note that this supplier self-report methodology is only one of a number of methodologies that will be used to calculate NTG ratios for the Massachusetts ENERGY STAR upstream lighting program. The other three approaches include a demand elasticity model, point-of-sale data analysis, and purchase estimates from comparison areas.

# Program Attribution

This report discusses the findings from the lighting manufacturer/retailer interviews and store manager surveys concerning program attribution (NTG ratios) for standard CFLs, specialty CFLs, and LEDs in Massachusetts.

The interviews and surveys defined standard CFLs as: “Bulbs that have spiral shapes, are not covered, and which do not have any special features such as dimmability or three-way capability.” We defined specialty CFLs as those: “…that do not have a spiral shape, like A-shape or globe-shape lamps, or CFLs with special features, such as dimmable, three-way, or reflector CFLs.”

We calculated separate attribution estimates for bulbs sold through stores characterized as selling to a hard-to-reach (HTR) market and stores not characterized as such. HTR-designated stores included the majority of stores characterized as “discount” retailers (such as dollar stores and other discount stores), ethnic grocery stores, charity/thrift stores, bulbs sold at food banks and ethic/immigrant/low-income advocacy community centers, and a few other stores targeting low-income citizens or certain ethnic communities.[7]

## Methodology

This section describes our approach for collecting the data and for calculating and weighting the NTG ratios from supplier self-reports—a methodology similar to that used for the program in 2011 and 2013.

### Collecting Data

We calculated our NTG ratio estimates based on responses to NTG questions that we collected from lighting manufacturers, retail lighting buyers, and store managers.[8] For lighting manufacturers and retail buyers, we attempted to complete in-depth interviews with a census of program participants. For store

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7 When designing this study, the PAs indicated to the Team that the definition of HTR stores was simply that they sold bulbs designated as HTR in the program data tracking system. The implementer decided which stores and bulbs were HTR. A review of the 2013 data tracking system revealed that the stores described in the text above are the only ones designated as selling HTR bulbs for that year.

8 To ensure we were reaching knowledgeable respondents among the store managers, we used retailer contact names provided by the program implementer Lockheed Martin and also used a number of screening questions in the survey including: “I3B Who would be familiar with sales and stocking trends for lighting products in your store?”, “I4. Hello I am from Tetra Tech. I am calling on behalf of [PA Name and] the Massachusetts ENERGY STAR lighting program. According to our records, your store recently participated in this program by selling discounted CFLs or LED bulbs from <SUPPLIER>. Are you familiar with this program?”, “I5. [IF “NO” TO I4] Who would be familiar with this program?” “I6AB. About how many months or years have you been working with the sale of lighting products?”, “I7. Now I’m going to use the abbreviation “CFL” to refer to compact fluorescent lamps. Are you the primary person who decides how many discounted CFLs your store(s) receives in shipments from <SUPPLIER> as part of this Massachusetts ENERGY STAR lighting program?“ , “I8. [IF “NO” TO I7]Who is the primary decision-maker?”

managers, we used a sample design similar to that used in past years, allowing comparability across years. We stratified the sample frame by retail channel.

The number of target completed surveys for each channel drew upon on three criteria:

1. The percentage of total bulb sales accounted for by that channel.
2. The number of unique store locations in the sample frame for that channel.
3. Whether the retail channel served HTR customers (this included an oversample as these stores proved of particular interest to the Energy Efficiency Advisory Council and Program Administrators).

The retail channels' in-store manager sample frame included the following:

1. *Discount stores* typically selling products at prices lower than those of traditional retail outlets.
2. *Drug stores* selling over-the-counter medications (and perhaps selling paper products, beverages, and a selection of grocery items).
3. *Grocery stores* typically selling perishable and non-perishable food items and stocking a small selection of household goods.
4. *Large Home Improvement* stores, a class of hardware stores typically occupying warehouse-style spaces (with many including dedicated outdoor garden centers).
5. *The Lighting and Electronics* channel group lighting retailers with electronics retailers. The former typically stock light fixtures, ceiling fans, and replacement lamps, while the latter sell home electronics and appliances.
6. *Mass Merchandise* stores typically stocking a large assortment of goods (including clothing, housewares, and sometimes food products and medications) at competitive prices.
7. *Membership Clubs*, typically warehouse-style stores stocking a wide variety of grocery and household items at lower prices. Consumers typically pay an annual membership fee to access these lower prices.
8. *Small Hardware* stores selling a variety of home repair, maintenance, and improvement products.

Table 5 shows the original sample frame began with 763 stores, an amount adjusted downward to 623 for reasons shown in the table. Despite the reduced sample frame, we hit all targets and completed more surveys (224) than originally targeted (221). The table shows overall response rates of 29%, ranging from a 20% response rate for the mass merchandise channel to a 42% response rate for the hardware channel.

**Table 5. Sampling Disposition for Store Manager CATI Surveys**

| Channel | Discount | Drug | Grocery | Hardware | Home Improvement | Lighting and Electronics | Mass Merchandise | Membership Club | Total |
|---|---|---|---|---|---|---|---|---|---|
| *Sample Size* | 292 | 30 | 192 | 72 | 60 | 25 | 60 | 32 | 763 |
| Fax/data line | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 5 |
| Bad number | 10 | 0 | 7 | 1 | 0 | 0 | 1 | 0 | 19 |
| Does not recall participation | 9 | 3 | 7 | 0 | 0 | 0 | 2 | 0 | 21 |
| Ineligible, no respondent | 41 | 10 | 33 | 1 | 2 | 0 | 8 | 0 | 95 |
| *Adjusted Sample Size* | 229 | 16 | 144 | 70 | 58 | 25 | 49 | 32 | 623 |
| Hard Refusal | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 3 |
| Soft Refusal[1] | 14 | 1 | 8 | 14 | 7 | 2 | 1 | 3 | 50 |
| Incompletes (partial interviews) | 9 | 0 | 9 | 5 | 6 | 0 | 7 | 2 | 38 |
| Immediate hang-up | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Language barrier/non-English | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| Referred to corporate | 92 | 3 | 35 | 3 | 5 | 0 | 17 | 8 | 163 |
| Active[2] | 36 | 4 | 40 | 17 | 16 | 13 | 12 | 4 | 142 |
| *Completed Surveys* | 77 | 8 | 48 | 30 | 24 | 10 | 12 | 15 | 224 |
| *Target Completes* | 77 | 6 | 48 | 29 | 24 | 10 | 12 | 15 | 221 |
| *Completes Needed* | 0 | -2 | 0 | -1 | 0 | 0 | 0 | 0 | 0 |
| *Percent to Target* | 100% | 133% | 100% | 103% | 100% | 100% | 100% | 100% | 101% |
| *Cooperation Rate*[3] | 33.6% | 50.0% | 33.3% | 42.9% | 41.4% | 40.0% | 24.5% | 46.9% | 36.0% |
| *Response Rate*[4] | 26.4% | 26.7% | 25.0% | 41.7% | 40.0% | 40.0% | 20.0% | 46.9% | 29.4% |

[1] Attempts were made to convert all soft refusals.

[2] An average of 4.35 contacts per active case were made.

[3] Number of completed surveys divided by Adjusted Sample Size

[4] Number of completed surveys divided by Sample Size

Source: Tetra Tech

## Calculating NTG Ratios from Supplier Interviews

To estimate NTG ratios, we asked manufacturers, retail lighting buyers, and store managers a series of questions about their sales of each bulb type in the program's absence. The store manager survey included the following relevant questions (the lighting manufacturers and retail buyers interview guides used similar questions):

*A3. During 2013 the Massachusetts ENERGY STAR program provided average buydown discounts of about [DISCOUNT AMOUNT] for every [BULB TYPE] bulb sold through the program. If these discounts had not been available, do you think your store(s) would have sold any of these types of [BULB TYPE] in the 2013 period?*

*A4. If these average buydown discounts offered by the program of [DISCOUNT AMOUNT] per [BULB TYPE] bulb were not available, do you think your sales of these bulbs would be about the same, lower, or higher?*

*A5. By what percentage do you estimate your store's sales of these [BULB TYPE] bulb would be lower during this 2013 period if the Massachusetts ENERGY STAR program discounts averaging [DISCOUNT AMOUNT] per [BULB TYPE] bulb were not available?*

*A6. I want to make sure I understand you correctly when you say your store's sales of [BULB TYPE] bulbs would be [% FROM QUESTION A5] lower without the program buydown discounts. So you're saying that if you sold 100 CFLs in a given week with the program discounts, you would have only sold [100 - (% FROM QUESTION A5 * 100)] that week without the program discounts. Is this correct?*

If respondents responded "no" to question A3 (*e.g*., they would not have sold any of that bulb type in the program's absence), they received an assigned NTG ratio of 100%, and the surveys skipped questions A4 through A6.

If, in responding to A4, they said their sales would have been *higher* without the program, we asked follow-up questions similar to A5 and A6, but probed regarding the size of *increased* sales absent the program. Only three of 224 store managers (1%) said their sales would have increased without the program. When asked why they believed the existence of the program lowered their sales, their responses indicated they thought the program had little effect on sales. We assigned these respondents NTG ratios of 0%.

Ratio assignments follow for each combination of responses to the questions above:

- If A3 = "no": NTG ratio = 100%
- If A3 = "yes" and A4 = "same": NTG ratio = 0%
- If A3 = "yes" and A4 = "lower": NTG ratio = % from A5
- If A3 = "yes" and A4 = "higher": NTG ratio = 0%
- If A3 = "don't know," respondents were still asked A4. If they said "don't know" to A4 or A5, they were marked as not being able to provide a NTG ratio.

If a given market actor sold multiple types of bulbs through the program, we asked this battery of NTG questions separately for each bulb type. Because lighting manufacturers sold bulbs through multiple retail channels, we asked the NTG questions separately for the retail channels they participated in. To limit the survey's length, however, not all manufacturers were asked to provide an estimate for each bulb type-channel combination they participated in. For manufacturers supplying many different retail channels, we prioritized obtaining NTG estimates from retail channels with the greatest program sales volumes.

### Weighting NTG Ratios from Supplier Interviews

To weight NTG ratios provided by individual respondents (within a given type of market actor) up to a retail channel level, we used the quantity of bulbs each respondent sold through the program. We then used a variety of methods to weigh the sales-weighted NTG ratios from the market actor category level to the channel-wide level.

In most cases, we used sales through the program that the estimates represented to weight each market actor category relative to each other. For example, if the sales-weighted NTG estimate from manufacturers accounted for 100,000 standard CFL sales and the sales-weighted NTG estimate from store managers accounted for 50,000 standard CFL sales, the manufacturer estimate would carry twice the weight of the store manager estimate.

In a few cases, we selected NTG ratio estimates that we thought originated from the respondents most knowledgeable about the program's effect on that retail channel. For example, we only used manufacturer and retail buyer NTG estimates for specialty CFLs sold through discount/HTR stores. Our rationale for doing this is based on interview responses from lighting manufacturers and retail buyers who reported that they would not be selling bulbs in these discount stores without the program discounts. In the case of the dollar stores, the dollar price limit precludes the sales of even the standard CFLs without program discounts. In past interviews we have conducted with lighting manufacturers, the lowest reported production costs for standard Energy Star CFLs have been in the $1.20-$1.25 per bulb range. In addition, our in-depth interviews with retail buyers of charity stores have revealed that they would also not sell these energy-efficient bulbs in absence of the program discounts. Finally, the manufacturer who supplied the largest retailer in the discount channel that was neither a dollar store nor a charity shop also reported that all their sales through this retailer would disappear in the absence of the program.[9] As we discuss in the following sections, the store managers may lack this market knowledge and still estimate that they would have sold some of these bulbs even though their suppliers and buyers indicated that these bulbs would have never arrived in the stores.

It should be noted that our decision to exclude the store manager NTG estimates for the discount channel does not mean that we should be equally skeptical about store managers NTG estimates in other retail channels. As noted, we take great effort to identify knowledgeable respondents and we assume that the store managers we survey are reasonably good observers of what their bulb sales are like when the program is in effect and when it is not, which is the foundation of this particular NTG methodology. The problem with the store manager NTG estimates in the discount channel is that the estimators likely lack the market knowledge, for example, that it cost $1.25 to manufacture a standard CFL.

Now one could argue that the discount store managers should have noticed that the bulbs disappeared when the program was not available and therefore should have provided NTG estimates close to 100%.

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[9] One of the commenters on the draft report was interested in knowing how many retailers in the discount channel were dollar stores or charity stores. The retailers that had "dollar" or "99 cents" or "98 cents" in their names accounted for 60% of the stores and 38% of the program CFL sales (both standard and specialty bulbs) in the discount channel. The charity stores made up 13% of the stores and 10% of the program CFL sales in the discount channel. For the remaining 27% of stores in the discount channel we could not tell from the store names whether or not they had some kind of dollar limit. However, one might reasonably assume that competitive pressures from the dollar stores and charity stores would constrain their price levels.

First the discount store manager NTG estimates were reasonably close to 100% (83%-98% depending on bulb type). In addition, our interviews over the years with discount store suppliers, retailers, and store managers have revealed that their general product offerings (not just light bulbs) are very changeable depending on what is cheaply available at the time from manufacturers and wholesalers. Therefore some store managers who noticed CFLs disappearing from their shelves when the program was in dormancy might think this is just a normal fluctuation in product offerings and not due to inherent economic barriers.

The final weighting approach used (although infrequently) was the simple average NTG estimate, computed by weighing each market actor category equally. We used this method when an outlying NTG estimate from one manufacturer would have heavily outweighed the more moderate estimates from several store managers under a sales-weighted approach. Throughout this report, we present recommended NTG ratios and NTG ratios resulting from a straight average of NTG ratios from the manufacturers, store managers, and retail buyers (if available).

### Threats to Validity

As with all NTG-estimation methodologies, the market actor self-report methodology presents limitations, some of which concern possible biases that lighting market actors might have and which may cause them to provide NTG estimates higher or lower than what would be the case without these biases. Other limitations concerned certain market actors' possible knowledge gaps regarding the market.

Two types of potential bias could affect the self-report NTG methodology used:

- *The gaming or "don't kill the golden goose" bias*: This potential bias occurs when market actors purposely exaggerate how much their lighting product sales would decrease in the program's absence, given their desire to continue receiving program discounts/rebates.
- *The green retailer bias*: This potential bias occurs when market actors underestimate how much their sales would drop in the program's absence. This may result from inflated confidence in their company's ability to market environmentally friendly products. This bias might be considered a variation of the "social desirability bias"—a well-known concept in program evaluation literature.

In theory, the gaming bias and green retailer bias work in opposite directions. However, the relative strengths of these biases and the degree that they offset each other remain unclear.

In the Massachusetts program, market actors with the strongest motives to engage in the gaming bias receive the greatest direct benefits of program discounts. For program bulbs receiving buydown discounts, this would be the manufacturer.[10]

The degree that gaming bias plays a role in the NTG estimate from supplier self-reporting depends on market actors knowing what that "game" is (*i.e*., that overestimating the decline in lighting product sales in the program's absence would increase the likelihood that the product continues to receive program rebates/discounts). Because nearly all lighting manufacturers and high-level retail buyers interviewed participated in multiple rebate/discount programs across the country, they likely know what the "game" is, whether or not they choose to play it. Most store managers, however, likely do not know what the "game" is.

By definition, retailers would be the most likely market actors to engage in the green retailer bias. Of the two types of retailers interviewed for this evaluation (*e.g.,* retail buyers and store managers), we considered retail buyers more likely to engage in the green retailer bias, partly due to retail buyers' greater knowledge (in comparison to store managers) regarding corporate environmental policies or campaigns. Additionally, some store managers represented independent stores or small chains that did not have corporate green policies.

Another potential threat to validity arose from some market actors simply lacking the broader market knowledge to competently assess what would happen to product sales in the program's absence. We reasoned lighting manufacturers had the greatest potential to accurately predict what would happen to sales without the lighting discount program, given (as explored in more detail through multiple, similar evaluations we have conducted) manufacturers have practical reasons for making such predictions accurately.

Every year (and in some cases, even more often), lighting manufacturers submit proposals to the Upstream Lighting Program managers, indicating how many of each product they think they can sell through each retail channel. Overestimating these sales means dealing with unhappy retail partners and program managers, neither of whom like overstocks. Of course, just because lighting manufacturers can more accurately predict what their sales would be without the program does not mean they will do so (per the previous discussion of the gaming bias).

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[10] While we cannot know if respondents game their responses, we did conduct a sensitivity analysis where we examined how overall NTG ratios would change if we eliminated the NTG estimates of manufacturers that estimated 100% NTG for all retail channels they served, including non-HTR channels. Removing these estimates caused the overall (HTR and non-HTR combined) NTG ratio for standard CFLs to move from 70% to 62%, the overall NTG ratio for specialty CFLs to move from 67% to 65%, and the overall NTG ratio for LEDs to move from 78% to 63%.

As discussed, for the CFL supply stream going to stores with a $1.00 price limit, charity shops, and other discount stores, lighting manufacturers and high-level retail buyers for this stream said those sales would have completely ceased without the program discounts. Yet some store managers thought they would continue to sell some of those bulbs, and, in some cases, thought the program had no or virtually no effect on their sales.

To the degree possible, we tried to mitigate these threats to validity. For example, regarding discount channel NTG ratios for HTR sales, we did not use store manager estimates in the final calculations, given the market knowledge barriers cited above.

In general, however, as manufacturers' and retailers' biases theoretically work in opposite directions, we developed channel-specific NTG estimates that incorporated estimates from both manufacturers and retailers. In determining recommended NTG ratios for each bulb type and channel, we also carefully paid attention to situations where a NTG estimate for a given market actor category would be heavily influenced by a few estimators producing NTG estimates very different from their fellow market actors. This especially proved true when outlier estimators represented large weights due to their high volumes of bulb sales. In such cases, we chose a different averaging method (*e.g.*, a straight average of all NTG estimates instead of a sales-weighted average) to mitigate these outlier effects.

## *NTG Ratio Estimates from Supplier Interviews*

This section presents NTG estimates for the various lighting technologies sold through the program, including ratios for all retail lighting channels. The discussion, however, addresses only the highest-selling channels for each bulb type.

### Standard CFLs

This subsection shows our calculated NTG ratios for standard CFL bulbs, both for HTR-designated stores and non-HTR stores. In 2013, the program focused slightly less on standard CFLs, with program-supported sales decreasing by 20% (from over 3.5 million to roughly 2.8 million bulbs) since the 2011 evaluation.

#### *Non-HTR Standard CFLs*

Table 6 shows channel-specific and program-wide NTG estimates from supplier interviews for standard CFLs sold through non-HTR stores. Sales exhibited fairly even distribution across the major retail channels, with five of the nine channels each accounting for 10% to 25% of total sales. Manufacturers, retail buyers, and store managers willing to provide NTG estimates for this bulb type accounted for, respectively, 73%, 11%, and 19% of total sales of these bulbs through the program. Table 6 presents the channel-specific "recommended NTG" ratios, all of which were calculated using a sales-weighted approach.

**Table 6. Channel-Specific and Program-Wide NTG Ratio Estimates for Non-HTR Standard CFLs Sold through the 2013 Program**

| Lighting Retail Channel | Bulb Sales in Channel | Number of Unique Estimates | NTG Ratio Estimates from Supplier Interviews (Weighted by Program Sales) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Manufacturers | Retail Buyers | Store Managers | Simple Avg. NTG | Recommended NTG |
| Discount | 24,064 | 4 | 100% | None | 77% | 88% | 81% |
| Drug | 21,200 | 5 | 80% | None | 54% | 67% | 80% |
| Grocery | 177,082 | 36 | 56% | None | 62% | 59% | 57% |
| Hardware | 222,700 | 27 | 62% | 18% | 32% | 37% | 48% |
| Home Improvement | 468,301 | 12 | 65% | None | 39% | 52% | 61% |
| Lighting and Electronics | 14,437 | 7 | 93% | None | 57% | 75% | 85% |
| Mass Merchandise | 417,745 | 10 | 45% | None | 71% | 58% | 47% |
| Membership Club | 406,244 | 15 | 66% | 60% | 44% | 57% | 58% |
| Other | 99,814 | 1 | 100% | None | None | 100% | 100% |
| **All Channels** | **1,851,587** | **117** | | | | | **58%** |

As with other bulb types, the smallest channels in terms of total sales (generally those with 25,000 or fewer bulbs sold) had the highest overall “recommended” estimates for program attribution. Generally, using this NTG estimation methodology, manufacturers produced higher estimates than store managers, possibly due to the potential biases previously discussed. However, manufacturers produced lower estimate for the grocery and mass merchandise channels than did their store manager counterparts. Overall, a program-wide recommended NTG estimate for non-HTR standard CFLs of 58% resulted.

For the channel with the largest volume of sales, the home improvement channel, store managers produced remarkably consistent estimates, with six of 10 estimating a NTG ratio between 20% and 40%. This range, however, proved significantly lower than the 65% estimate from two manufacturers, where a single large manufacturer dominated. This resulted in a channel-wide recommended NTG ratio of 61%.

Among channels selling the largest volume of bulbs, the mass merchandise channel produced the lowest recommended NTG estimate (45%). While the two manufacturers providing estimates remained fairly consistent, store managers presented polarized opinions, with two of eight managers providing an estimate attributing all of their sales to the program, and five of eight providing NTG estimates of 30% and lower.

In terms of the hardware channel, one of the 22 store managers accounted for the great majority of sales and provided a relatively low NTG estimate, heavy influencing the sales-weighted store manager estimate. Store managers in the hardware channel produced a straight average of 50%. Using this straight average estimate for store managers would have increased the recommended NTG ratio to 53% for the channel as a whole.

Grocery stores typically allocate little shelving space for lighting products; so, while many grocery stores participated in the MA lighting program (aggregate sales were the highest among all channels), average sales per store were relatively low. Market actors in general did not view the grocery channel as a "destination" for lighting purchases, but rather as a place where shoppers purchased light bulbs on impulse or in reaction to sales. Qualitative responses from many store managers were consistent with this view, and store managers overall produced relatively high NTG estimates compared to higher-sales channels. More than half (17 of 33) of store managers providing a NTG estimate said they would not have sold standard CFLs without the program. An overall recommended NTG ratio of 57% resulted for the grocery channel.

As with other bulb types, standard CFLs sold through the "other" retail channel received a very high NTG estimate. Although this estimate derived from a single manufacturer, we feel comfortable using the result as this channel's sales predominantly came from schools, malls, office buildings, fairs, and other events. These bulb distributions likely would not have been coordinated in the program's absence.

### *HTR Standard CFLs*

Table 7 shows channel-specific and program-wide NTG estimates for standard CFLs sold through HTR stores, with more than two-thirds of those bulbs sold through the discount channel. The "other" channel (primarily consisting of cultural advocacy organizations and cultural events such as festivals) and the grocery channel (largely ethnic grocery stores) sold most of the remaining bulbs.

**Table 7. Channel-Specific and Program-Wide NTG Ratio Estimates for HTR Standard CFLs Sold through the 2013 Program**

| Lighting Retail Channel | Bulb Sales in Channel | Number of Unique Estimates | NTG Ratio Estimates from Supplier Interviews (Weighted by Program Sales) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Manufacturers | Retail Buyers | Store Managers | Simple Avg. NTG | Recommended NTG |
| Discount | 659,055 | 6 | 93% | 100% | None | 96% | 93% |
| Grocery | 59,804 | 1 | 100% | None | None | 100% | 100% |
| Mass Merchandise | 2,668 | 1 | 100% | None | None | 100% | 100% |
| Other | 196,882 | 1 | 100% | None | None | 100% | 100% |
| **All Channels** | **918,409** | **9** | | | | | **95%** |

Manufacturers and retail buyers represented all attribution estimates for these standard CFLs (accounting for 74% and 5% of program sales, respectively), as we did not obtain estimates from store managers for these bulbs.[11]

As discussed previously, in the Massachusetts lighting program, dollar stores and charity retailers (*e.g*., Goodwill Industries, Salvation Army Pantry) made up roughly half of the HTR discount channel, which accounted for most HTR standard CFL sales. Many years of in-depth interviews with lighting manufacturers and retail buyers supplying dollar stores and charity retailers have found most of these stores will not stock such bulbs unless they receive them free (after program discounts). At most, the stores might be willing to pay $0.50 per bulb, which, for a dollar store would allow "keystone pricing" (*i.e*., a 100% markup over the wholesale price). As lighting manufacturers reported minimum production cost for a standard CFL of about $1.25 per bulb, these HTR stores clearly could not stock these CFLs without program discounts. Additionally, as discussed, one might reasonably assume that competitive pressures from the dollar stores and charity stores would constrain the price levels of the remainder of the discount stores selling HTR bulbs.

Yet as discussed in this report's Methodology section, a few HTR store managers remained unaware of this economic reality and still estimated they would have sold some CFLs in the program's absence. For this reason, our recent (2014) evaluation of the California Upstream lighting program did not include store manager NTG estimates in our recommended NTG ratio for the discount channel. We followed the same path for the Massachusetts HTR standard bulbs, although, in this case, did so out of necessity as well as choice.

All channel-specific "recommended NTG" ratios in the table are directly derived from manufacturer estimates. At 95%, HTR stores produced a much higher overall NTG estimate than non-HTR stores.

### *Aggregated Standard CFLs*

As mentioned previously, in March 2015 some of the PA representatives requested that the evaluation team add some NTG ratios to the report which were calculated at the retail channel grouping level. These channel groupings are as follows:

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11 We obtained the store manager NTG ratio for HTR standard CFLs in the 2013 Massachusetts store manager survey (covering program years 2011–2012), resulting in 88% for the discount/HTR channel. The 2011 Massachusetts store manager survey (covering program years 2009–2010) resulted in 83%. In 2013, the program renamed tracking data for these standard CFLs sold through HTR channels as "HTR bulbs"; unfortunately, we did not change our CATI programming instructions to account for this name change. Consequently, the standard CFL NTG question battery skipped HTR store managers. We did obtain 2013 NTG ratios for specialty bulbs in the HTR channels (where the bulb name did not change). As discussed, we obtained 2013 NTG estimates for standard CFLs in non-HTR channels.

- *Home Improvement:* This grouping includes all non-HTR standard CFLs sold in the home improvement channel
- *HTR:* This grouping includes all HTR standard CFLs plus non-HTR standard CFLs sold through the discount channel
- *All Other:* This grouping includes all non-HTR standard CFLs except those sold in the home improvement or discount channels

Table 8 shows the NTG ratio estimates at the channel grouping level for standard CFLs. As the table shows, twice as many bulbs were sold through the HTR channel grouping than through home improvement stores, and the NTG ratio for these bulbs was considerably higher (93% vs. 61%). The "All Other" channel grouping consisted largely of bulbs sold through the mass merchandise and membership club channels, which had lower NTG estimates in general.

**Table 8. Channel Grouping NTG Ratio Estimates for Standard CFLs Sold through the 2013 Program**

| Lighting Retail Channel Grouping | Bulb Sales in Channel Grouping | Number of Unique Estimates | Recommended NTG |
|---|---|---|---|
| Home Improvement | 468,301 | 12 | 61% |
| HTR | 942,473 | 13 | 93% |
| All Other | 1,359,222 | 101 | 53% |
| **All Channel Groupings** | **2,769,996** | **126** | **68%** |

## Specialty CFLs

This subsection shows calculated NTG ratios for specialty CFL bulbs, derived through HTR-designated stores and non-HTR stores. Specialty CFLs presented a greater program focus in 2013 than in the past, with sales increasing by 90% since the 2011 evaluation (from less than 900,000 to more than 1.6 million bulbs).

### *Non-HTR Specialty CFLs*

Table 9 shows channel-specific and program-wide NTG estimates from supplier interviews for specialty CFLs sold through non-HTR stores. Sales of specialty CFLs distributed less evenly than standard CFLs across channels, with the home improvement and "other" channels accounting for 78% of sales.

**Table 9. Channel-Specific and Program-Wide NTG Ratio Estimates for Non-HTR Specialty CFLs Sold through the 2013 Program**

| Lighting Retail Channel | Bulb Sales in Channel | Number of Unique Estimates | NTG Ratio Estimates from Supplier Interviews (Weighted by Program Sales) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Manufacturers | Retail Buyers | Store Managers | Simple Avg. NTG | Recommended NTG |
| Discount | 4,109 | 6 | 100% | None | 97% | 98% | 98% |
| Drug | 1,368 | 1 | 80% | None | None | 80% | 80% |
| Grocery | 40,028 | 25 | 73% | None | 89% | 81% | 76% |
| Hardware | 88,836 | 24 | 94% | 30% | 45% | 56% | 56% |
| Home Improvement | 655,752 | 16 | 41% | None | 29% | 35% | 39% |
| Lighting and Electronics | 7,635 | 10 | 94% | None | 86% | 90% | 92% |
| Mass Merchandise | 78,521 | 8 | 38% | None | 66% | 52% | 40% |
| Membership Club | 69,447 | 14 | 66% | 67% | 53% | 62% | 63% |
| Other | 358,099 | 4 | 95% | None | 100% | 97% | 95% |
| **All Channels** | **1,303,795** | **108** | | | | | **58%** |

As with other bulb types, the smallest channels in terms of total sales (generally with 25,000 or fewer bulbs sold) had some of the highest overall "recommended" estimates for program attribution. As with standard CFLs, the manufacturers produced lower estimates for the grocery and mass merchandise channels than did their store manager counterparts. The manufacturer, retail buyer, and store manager NTG estimates accounted, respectively, for 62%, 5%, and 11% of total sales for these bulbs.

A sales-weighted approach served as the default method used for each "recommended NTG" ratio in Table 9, with one noted exception (we used a simple average for the hardware retail channel). Overall, a program-wide recommended NTG estimate for non-HTR specialty CFLs of 58% resulted, the same as for non-HTR standard CFLs.

The highest-selling channel for specialty CFLs, the home improvement channel, saw the second-lowest attribution estimates among all channels, especially from the 13 store managers, who attributed less than one-third of their collective sales of specialty CFLs to the program. Home improvement store managers also reported the highest average sales per store surveyed among all the store types.

One explanation for the lower NTG ratios for specialty CFLs in the home improvement channel is that home improvement stores traditionally serving as "destination stores" for lighting purchases. For example, if a customer makes a special trip to a home improvement store with the intention of buying a specialty bulb, they are unlikely to walk away from these bulbs simply due to prices being higher than they would prefer. However, higher prices would more likely deter them in other shopping environments (*e.g.*, discount or grocery stores), where lighting purchase decisions tend to be more of an “impulse buy.” Shopper intercept research we have conducted in California has found lighting purchasers in home improvement stores to be less price sensitive than purchasers in other retail channels.

Due to their higher sales volumes, they may have believed they would continue to sell those bulbs without the program (whether or not true). The home improvement channel produced significantly higher sales of specialty CFLs than standard CFLs (655,000 vs. 486,000), the only channel besides “other” in which this was the case.

Another relatively high-volume channel, hardware, produced the least consistent estimates across different market actors. Opinions were split within the store manager estimates, with the smaller stores in terms of sales giving higher estimates (generally 60% and above) and the larger stores giving lower estimates (generally 50% and lower). Additionally, the sales-weighted manufacturer estimate proved much larger than the retail buyer or store manager ratios—a disparity primarily caused by one relatively large manufacturer providing a 100% NTG ratio estimate. To diminish the effect of this anomalous number, we used the simple average estimate and not the sales-weighted methodology when determining an estimate for the channel as a whole.

Among the major sellers, the grocery channel reported relatively high NTG estimates, especially from store managers. Managers from the three largest stores in terms of sales (accounting for 76% of sales from those surveyed in the grocery channel) reported 100% NTG ratios. At the same time, seven of the other 19 store managers provided NTG estimates of 25% or less. The straight average NTG ratio among store managers produced a 62% estimate, considerably lower than the sales-weighted 89%.

Such variability in the grocery sector is not unusual as this channel contains a greater variety of store chains compared to other retail channels (in terms of store sizes and target customers). The limited shelf space for grocery stores, as noted, means store managers often prefer to sell higher-volume sales products, such as standard CFLs rather than specialty CFLs, as reflected in the Massachusetts program’s sales volume.

As with other bulb types, specialty CFLs sold through the “other” retail channel received a very high NTG estimate. Although this estimate derived from relatively few sources (three manufacturers and one store manager), we feel comfortable using it, as the “other” channel’s sales predominantly came from schools, malls, office buildings, fairs, and other events, which would be very unlikely to distribute these bulbs in the program’s absence.

### *HTR Specialty CFLs*

Table 10 shows channel-specific and program-wide NTG estimates for specialty CFLs sold through HTR stores. The discount channel sold roughly 90% of those bulbs. The grocery channel (mostly ethnic grocery stores) sold most of the remaining bulbs.

**Table 10. Channel-Specific and Program-Wide NTG Ratio Estimates for HTR Specialty CFLs Sold through the 2013 Program**

| Lighting Retail Channel | Bulb Sales in Channel | Number of Unique Estimates | NTG Ratio Estimates from Supplier Interviews (Weighted by Program Sales) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Manufacturers | Retail Buyers | Store Managers | Simple Avg. NTG | Recommended NTG |
| Discount | 324,906 | 52 | 99% | 100% | 83% | 94% | 99% |
| Grocery | 22,100 | 5 | 100% | None | 67% | 84% | 100% |
| Mass Merchandise | 2,750 | 1 | 100% | None | None | 100% | 100% |
| Other | 11,564 | 3 | 100% | None | 100% | 100% | 100% |
| **All Channels** | **361,320** | **61** | | | | | **99%** |

The manufacturer, retail buyer, and store manager estimates accounted, respectively, for 99%, 3%, and 19% of these bulbs' total sales. We did not, however, use store manager input to calculate our recommended NTG estimates. As discussed, store managers may not have information on their CFL wholesale costs, and therefore may not realize ENERGY STAR CFLs likely could not be supplied to them at a sufficiently low cost to resell the bulbs without program discounts.

For the "recommended NTG" ratio for the discount channel, we used a sales-weighted average between manufacturer and retail buyer estimates. For the other channels, we simply used the manufacturer estimates. This resulted in a much higher overall NTG estimate than for non-HTR stores: at over 99%.

### *Aggregated Specialty CFLs*

As with standard CFLs, we aggregated channels into "channel groupings" and recalculated the "recommended NTG" estimates based on these groupings. These channel groupings for specialty CFLs are the same as those for standard CFLs. As Table 11 shows, nearly twice as many bulbs were sold through the home improvement channel grouping than through HTR stores. The NTG ratio for these home improvement bulbs was much lower than for HTR (39% vs. 98%), and also considerably lower than for standard CFLs sold through home improvement stores (61%). A majority of the "All Other" channel grouping came from the "other" channel (schools, malls, office buildings, etc.), which had very high NTG estimates. This may explain why the "All Other" channel grouping for specialty CFLs was higher than for standard CFLs, which consisted primarily of bulbs sold through the mass merchandise and membership club channels.

**Table 11. Channel Grouping NTG Ratio Estimates for All Specialty CFLs Sold through the 2013 Program**

| Lighting Retail Channel Grouping | Bulb Sales in Channel Grouping | Number of Unique Estimates | Recommended NTG |
|---|---|---|---|
| Home Improvement | 655,752 | 16 | 39% |
| HTR | 365,429 | 67 | 98% |
| All Other | 643,934 | 86 | 70% |
| **All Channel Groupings** | **1,665,115** | **169** | **64%** |

### LEDs

This subsection addresses calculated NTG ratios for LED bulbs, all of which the program sold through stores classified as non-HTR. Relatively new to the program, LEDs equal about one-fifth of the sales of standard CFLs and one-third of the sales of specialty CFLs (combining HTR and Non-HTR for each bulb type).

Table 12 shows the channel-specific and program-wide NTG estimates for LED lamps sold through the program. LED sales mostly concentrated in two retail channels—home improvement and membership club, which accounted for nearly two-thirds of all sales. As with other bulb types, manufacturer NTG estimates for the grocery store channel proved lower than their store manager counterparts. Manufacturer, retail buyer, and store manager estimates accounted for 62%, 34%, and 18% of total program LED sales.

**Table 12. Channel-Specific and Program-Wide NTG Ratio Estimates for LEDs Sold through the 2013 Program**

| Lighting Retail Channel | Bulb Sales in Channel | Number of Unique Estimates | NTG Ratio Estimates from Supplier Interviews (Weighted by Program Sales) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Manufacturers | Retail Buyers | Store Managers | Simple Avg. NTG | Recommended NTG |
| Discount | 124 | 3 | 100% | None | 85% | 93% | 98% |
| Drug | 7,776 | 3 | 100% | None | 43% | 72% | 98% |
| Grocery | 10,394 | 9 | 10% | None | 48% | 29% | 29% |
| Hardware | 74,174 | 27 | 98% | 40% | 76% | 71% | 83% |
| Home Improvement | 163,665 | 12 | 100% | None | 49% | 74% | 74% |
| Lighting and Electronics | 26,398 | 11 | 82% | None | 48% | 65% | 72% |
| Mass Merchandise | 2,389 | 6 | 100% | None | 96% | 98% | 97% |
| Membership Club | 162,049 | 14 | 74% | 67% | 52% | 64% | 68% |
| Other | 61,116 | 4 | 91% | None | 40% | 65% | 90% |
| **All Channels** | **508,085** | **89** | | | | | **75%** |

In the table, the sales-weighted approach served as the default method used for each "recommended NTG" ratio, but for two noted exceptions (where we used a simple average for the home improvement and grocery channels). Overall, a 75% program-wide recommended NTG estimate resulted—the highest of the three bulb types. LEDs also produced the highest gap between manufacturers and store managers, with manufacturers averaging 84% and store managers averaging 57% (both weighted by sales).

The home improvement channel served as the highest-selling retail channel for LEDs in Massachusetts. The high (100%) manufacturer estimate shown in the table came from a single manufacturer that accounted for a relatively small proportion of sales through the channel. Due to this outlier, we used a straight average estimate between the manufacturer and the 12 store managers that gave estimates. Store managers somewhat balanced out the high manufacturer-assigned ratio, resulting in a recommended NTG ratio of 74% for the channel.

The hardware channel also saw a very high manufacturer estimate, derived from three separate manufacturers. A much lower estimate from the large retail buyer counteracted these high estimates, with the estimates of 23 store managers coming closest to the recommended average NTG.

The second-largest channel for LEDs—membership club—saw the most balanced estimates from the three types of market actors, in the order that one would expect: manufacturers reported the highest program attribution estimates (74%), followed by retail buyers (67%) and store managers (52%).

Notably, in the grocery channel, only one manufacturer provided a NTG estimate (which was a noticeable outlier relative to manufacturer estimates for other retail channels, and lower than the single manufacturer's estimates for either type of CFL). To reduce the impact of this outlier, we used the simple average NTG rather than the sales-weighted one. A NTG ratio estimate of 29% resulted, which was still relatively low, but closer to the estimates from other channels.

As with other bulb types, LEDs sold through the "other" retail channel received a very high NTG estimate. Although this estimate came from relatively few sources (two manufacturers), we feel comfortable using it as this channel's sales predominantly came from schools, malls, office buildings, fairs, and other events, which likely would not have happened in the program's absence.

### Aggregated LEDs

Here again, we aggregated channels into "channel groupings" and recalculated the "recommended NTG" estimates. These channel groupings for LEDs are the same as those for standard and specialty CFLs. As Table 13 shows, there were virtually no LED bulbs sold through HTR or discount stores. Roughly one-third of all LEDs were sold through the home improvement channel grouping, resulting in a NTG ratio estimate of 74%. The "All Other" channel grouping, roughly half of which was through the membership club channel, had a very similar estimate.

**Table 13. Channel Grouping NTG Ratio Estimates for LEDs Sold through the 2013 Program**

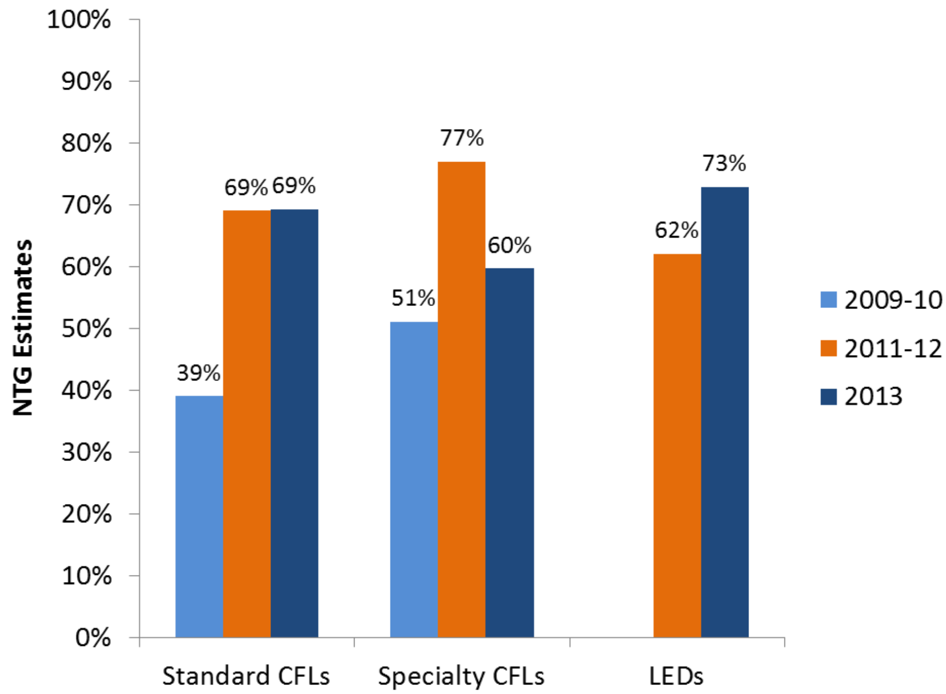
| Lighting Retail Channel Grouping | Bulb Sales in Channel Grouping | Number of Unique Estimates | Recommended NTG |
|---|---|---|---|
| Home Improvement | 163,665 | 12 | 74% |
| HTR | 124 | 3 | 98% |
| All Other | 344,296 | 74 | 73% |
| **All Channel Groupings** | **508,085** | **89** | **73%** |

## Year-to-Year Comparison and Conclusions

Figure 7 compares NTG ratios provided by the 2013 program participants with those reported in previous program years, using the same supplier self-report methodology. While the 2009–2010 and

2013 estimates included NTG estimates from all three market actor levels (*e.g.*, manufacturers, retail buyers, and store managers), the 2011–2012 estimates only included estimates from store managers.[12]

**Figure 7. Supplier Self-Report Methodology NTG Estimates for Each Bulb Type, by Participation Year**




The chart shows much higher NTG ratios for the 2013 program year than for the 2009–2010 program year—the last program year basing NTG ratios on estimates from all three levels of the lighting supply chain.

Given Massachusetts energy efficiency programs have promoted CFLs since the late 1990s, it may appear surprising that market actors still estimated CFL sales would decline by 60-70% in the program's absence. This may result for two reasons.

First, as DNV GL discussed in its evaluation of the 2011–2012 program, EISA-compliant halogens entered the market over the past few years. These present CFLs with a lower-cost competitor that bears a close resemblance to the incandescent bulbs with which many consumers remain most comfortable, while marketed as an energy-efficient bulb in comparison to incandescents.

12 To allow comparability across the years in this graphic, the 2013 NTG ratios here do not include the "other" lighting sales category (which included distribution of light bulbs at community events, schools, office buildings, malls, etc.).

Some manufacturers selling CFLs in the Massachusetts and California residential lighting markets have recently cited California as a "cautionary tale" for what would happen in the Massachusetts lighting market if the Massachusetts program eliminated or significantly reduced CFL discounts. After California mostly eliminated discounts for standard CFLs in 2013, some major suppliers to the California market have reported that EISA-compliant halogens gained significant market shares at the expense of CFLs, which rose to a higher price point in the absence of program discounts. DNV GL is currently conducting a new round of lighting shelf surveys in California to try to verify these claims.

A major lighting manufacturer we interviewed in 2014 described the challenges CFLs in California faced from competition with EISA-compliant halogens:

> *Well, in absence of a program, a CFL would be $4.00.… So [a typical bulb shopper in a hardware store] goes over, he looks at the light bulb section. He sees some souped-up halogen bulb, 18 lumens a watt that meets EISA on the shelf. And those are $0.80 a piece…they may be $9.99 for a 12-pack or something like that, a six-pack, it depends, but cheap.… Here in California…we do a lot of business with [a major California grocery chain]. And we have data from them that the CFL category has dropped off in California by about 50%, and all this market share has been taken by the halogen. So CFLs have eroded because there's an absence of utility funding in California [for CFL discounts]… But those [EISA-compliant halogens] just developed since EISA. Those were not around. EISA created those halogen SKUs [stock keeping units], and that was a bad product that nobody saw coming except the majors [the largest lighting manufacturers who used to produce incandescents] were able to get that workaround. And in my opinion, it makes the EISA law very counterproductive, because it's really forcing more people back to less efficient light bulb sources than the other way.*

Second, the higher NTG also could have partially resulted from the Massachusetts program, over time, shifting greater volumes of bulb shipments from "big box" retail channels—such as large home improvement (*e.g.*, Home Depot), mass merchandise (*e.g.*, Walmart) and membership club (*e.g.* Costco)—to HTR lighting markets, such as discount and ethnic grocery retail markets. Because the supplier self-report method weights the program's overall NTG ratio based on program sales, the higher volume of bulbs available through HTR channels increased the program's overall self-report NTG ratio. Within the discount channel, the Massachusetts program has experienced volume shifts towards more dollar/99 cent stores and charity store chains (*e.g.*, Goodwill, Salvation Army), further increasing the channel's NTG ratios.

Table 14 and Table 15 show major shifts in the program shares for standard and specialty CFLs between the 2009–2010 and 2013 program years, with standard CFLs more than tripling their program shares in the discount channel, while specialty CFLs nearly doubled their program shares in this channel. The tables also show large differences in the self-report NTG ratios between discount channels and big box channels in both time periods.

**Table 14. Program Share of Standard CFLs in Discount and Big Box Channels, 2009–2010 vs. 2013**

| Retail Channel | 2009–2010 | | 2013 | |
|---|---|---|---|---|
| | Percent of Program Sales | NTG Estimate | Percent of Program Sales | NTG Estimate |
| Discount | 9% | 72% | 30% | 93% |
| Big Box (Home Improvement, Mass Merchandise, Membership Club) | 61% | 33% | 52% | 56% |

Note: The "percent of program sales" estimates exclude the "other" retail channel.

**Table 15. Program Share of Specialty CFLs in Discount and Big Box Channels, 2009–2010 vs. 2013**

| Retail Channel | 2009–2010 | | 2013 | |
|---|---|---|---|---|
| | Percent of Program Sales | NTG Estimate | Percent of Program Sales | NTG Estimate |
| Discount | 14% | 79% | 27% | 99% |
| Big Box (Home Improvement, Mass Merchandise, Membership Club) | 75% | 47% | 62% | 41% |

Note: The "percent of program sales" estimates exclude the "other" retail channel.

Though we could not compare the 2013 self-reported NTG estimate for LED sales, given the absence of a 2009–2010 NTG estimate for LED sales (and only store managers providing the 2011–2012 estimate), comments from market actors indicated that, while LED prices fell somewhat, their prices remained high in comparison to other bulb types. Therefore, the program discounts are expected to have remained important for LED bulbs.

# Appendix A: Detailed Explanation of Program Tracking Data Classification

To achieve our final bulb counts, the evaluation team made several assumptions about the raw sales data provided by Parago. These assumptions involved the state, year, product type and measure category, retail channel, and HTR or non-HTR status. Table 16 summarizes how we filtered these data based on geographic, program year, product type, and retailer information.

**State**: The raw data contained two state fields: “promo state” and “store state.” Both fields included some observations from Rhode Island in addition to Massachusetts. In some cases, the state fields did not match (RI-MA or MA-RI); in those cases, we assigned a state based on the name of the city. When only one of the state fields was populated, we used the reported state. Observations listed only as Rhode Island or those with one field as Rhode Island and a Rhode Island city, were dropped.

**Year**: The raw data also contained multiple year variables, among which we primarily considered “rebate year” and “invoice year.” The evaluation team included in our analyses the records for which “rebate year” was 2013 or “rebate year” was missing but “invoice year” was 2013. We felt confident in this assumption because in all cases in which “invoice year” was 2013 and “rebate year” was reported, “rebate year” was also 2013.

**Product type and measure category**: Both the “product type” and “measure category” fields included information about the bulb. The evaluation team used both fields to create a map that grouped bulbs into standard CFL, specialty CFL, LED, and hard-to-reach (HTR). During this process, records that were not bulbs, such as televisions or smart power strips, as well as non-program bulbs such as outdoor fixtures and torchieres, were excluded from further analysis. We used the “model description” field in cases where “product type” and “measure category” were insufficient to determine bulb type. Records with no bulb description among the three fields were dropped. In general, we coded bulb types described as hard to reach as HTR, those including LED in the description as LED, bulbs described as standard or spiral as standard CFLs, and those with bulb descriptions that included specialty, A-lamp, three-way, reflectors, or candle base as specialty CFLs.

***Retailer name***: There were a large number of shipments in the program tracking data from Parago that did not identify the retailer. We dropped these observations because we need a retailer name to be able to assign the bulbs to a retail channel for use in the sales weights.

**Retail channel**: The evaluation team also mapped stores to retail channels. Records which did not include a store or retail name could not be mapped, and thus were dropped from further analysis. Manufacturer names were also recoded for consistency; for instance, slight differences in spelling.

**HTR or non-HTR**: The raw data included HTR information in the “measure type” or “product category” fields. The evaluation team coded retailers as HTR retailers if they sold any HTR-designated bulbs at all.

Other bulb types (such as specialty CFLs) sold at HTR retailers were not coded as HTR bulbs; however, for the purpose of our analysis, they remained segregated from similar bulbs sold by non-HTR retailers.

The following table summarizes how we filtered the 2013 program tracking data based on geographic, program year, product type, and retailer information.

**Table 16: Steps for Filtering the 2013 Program Tracking Data**

| Data Filtering Step | # of Units Dropped in the Data Filtering Step | # of Units Remaining After Data Filtering Step |
|---|---|---|
| Unfiltered 2013 program tracking data from Parago | Not applicable | 8,240,458 |
| Limiting data to stores with Massachusetts locations | 1,141,327 | 7,099,131 |
| Limiting data to records where Rebate Year variable = 2013 or where Rebate Year variable is missing and Invoice Year variable = 2013 | 10,350 | 7,088,781 |
| Removing observations missing any product description | 112,156 | 6,976,625 |
| Removing observations with product descriptions that are not light bulbs | 544,351 | 6,432,274 |
| Removing observations where the retailer information is missing | 1,488,687 | 4,943,587 |

# Appendix B: Interview Guide for Manufacturers and Retail Buyers Participating in the 2013 Massachusetts and Connecticut ENERGY STAR® Lighting Programs

## Objectives

The objectives of this interview guide are to gather the perspectives of lighting manufacturers and buyers of lighting products for major retail chains on a number of topics concerning the Massachusetts lighting market including:

- *Program attribution:* The interviewee's assessments of the PAs' program effects on sales of CFLs and LEDs and also their thoughts on the programs' likely future effects on LEDs if LED prices fall significantly;
- *The impacts of Energy Independence and Security Act (EISA):* The interviewee perceptions of EISA's past, present, and future effects on the sales and stocking of different types of light bulbs;
- *The LED market:* The interviewee assessments of the market for LEDs, including sales, stocking, and pricing trends;
- *The Hard-to-Reach (HTR) lighting market:* The interviewee perceptions of the Program Administrator's (PA's) definition of HTR customers and what alternative definitions they suggest using;
- *Market lift:* Whether the interviewee's company participated in any market lift programs, what the advantages and disadvantages of these programs are, and whether LEDs can be viable products for market lift.

The Connecticut Energy Efficiency Board's Evaluation Consultant, who also advises National Grid and NSTAR in Massachusetts, has also asked that we include some questions about the Connecticut lighting program in this guide. The evaluators leave the discussion of cost sharing for this joint effort to the PAs and EEB Evaluation Consultant.

## Contact Protocol

1. Call potential interviewees to ascertain most appropriate interviewee. Obtain email address(es) of appropriate interviewees. If company refuses interview, determine reasons for refusal and if it's logistical in nature, try to find workaround.
2. Send email interview invitation to appropriate interviewee. This invitation will include:
    a) Explanation of purpose and scope of interview.
    b) Explanation of time frame within which the interview will need to be completed.
    c) Explanation of expected duration of interview and flexibility to complete interview over multiple sessions.

d) Instructions to propose a convenient interview time.

e) Contact information for interviewers.

f) Assurances of confidentiality.

g) A letter attachment from the Massachusetts PAs and the Connecticut Energy Efficiency Board explaining the importance of the interview.

3. Once an interview time has been arranged, the interviewee will be emailed, a couple days in advance of the interview, a summary of the interview topics and a table summarizing their shipments of discounted lighting products through the Massachusetts ENERGY STAR Lighting Program (and Connecticut if applicable) disaggregated by lighting product categories and retail channels (for lighting manufacturers). The email will contain additional assurances of confidentiality.
4. At the beginning of the interview, collect information on interviewee's position and overall responsibilities, and experience with the program

### Key

**Participants:** Manufacturers and retail buyers participating in the 2013 Massachusetts or Connecticut ENERGY STAR Lighting Programs

**New Participants:** Manufacturers and retail buyers that were not in the 2011-2012 Massachusetts ENERGY STAR Lighting Program sample frame but are in the 2013 sample frame (and have not been previously interviewed)

**Previously Interviewed:** Manufacturers and retail buyers interviewed in 2012 or 2013 for the evaluation of the 2011-2012 Massachusetts ENERGY STAR LIGHTING program cycle.

**Not Previously Interviewed:** Manufacturers and retail buyers not previously interviewed.

## Section 1: Program Participation Confirmation and Reasons for Participation

### The Nature of Program Participation

1-1. The Massachusetts Program Administrators jointly participate in an ENERGY STAR Lighting Program. According to our records your company has supplied/purchased lighting products that have received upstream incentives from the Massachusetts ENERGY STAR Lighting Program during the 2013 period. This program has, since 2003, offered upstream buydown or markdown discounts for CFL and LED products that are sold through various Massachusetts retailers. Are you familiar with your company's participation in this program?
[IF UNAWARE, FIND SOMEONE WITH THE COMPANY WHO IS AWARE.] [IF UNAWARE, FIND SOMEONE WITH THE COMPANY WHO IS AWARE. IF THEY RECOGNIZE THIS PROGRAM BY A

DIFFERENT NAME, EXPLAIN THAT FOR THE SAKE OF SIMPLICITY YOU'LL HENCEFORTH REFER TO THE PROGRAM AS "THE MASSACHUSETTS ENERGY STAR LIGHTING PROGRAM."]

1-2. Besides getting these financial incentives, are there any other aspects of the 2013Massachusetts ENERGY STAR Lighting Program that your company has actively taken part in?

a) [IF YES] What other aspects of this program has your company been involved in?

1-3. **[Previously Interviewed Only]** Has your company's participation or involvement in the Massachusetts ENERGY STAR Lighting Program changed since you were last interviewed in 2012/2013?

a) If so, how has it changed?

1-4. **[Not Previously-Interviewed Only]** About what year did your company first get involved with the Massachusetts ENERGY STAR Lighting Program?

1-5. **[Not Previously-Interviewed Only]** What was your primary reason for getting involved with the Massachusetts ENERGY STAR Lighting Program?

1-6. **[Not Previously-Interviewed Only]** Did you have any other reasons for getting involved with the Massachusetts ENERGY STAR Lighting Program?

a) [IF YES] What were these?

1-7. In addition to this Massachusetts residential lighting program, are you also familiar with your company's sales of linear fluorescent lighting, especially to the commercial and industrial market?

a) [IF NO] Who at your company would be knowledgeable about your company's sales of linear fluorescent bulbs to C&I customers?

1-8. [ONLY IF THEIR COMPANY PARTICIPATES IN BOTH THE MASSACHUSETTS AND CONNECTICUT LIGHTING PROGRAMS] According to our information your company is also participating in a similar Connecticut program that offers buydowns and markdowns on energy-efficient lighting products. Are you also familiar with your company's participation in this program?

a) [IF NO] Who would be the person at your company who would be most familiar with your participation in this Connecticut program?

## Section 2: Program and Non-Program Sales

### Verifying the Program Sales

2-1. First I'm going to ask you some questions about your sales of CFL and LED bulbs in Massachusetts. Now earlier I emailed you a table that shows you a record of the types of CFL& LED bulbs that we have records of you selling through the 2013 ENERGY STAR Lighting Program. Does the table I sent to you seem correct in terms of the types and volume of CFLs & LED products you sold through the Massachusetts ENERGY STAR Lighting Program?

a) [IF NO] [Record any corrections to the table]

2-2. Why did you choose to sell these particular products and packages through the Massachusetts ENERGY STAR Lighting Program?

2-3. [ONLY IF THEIR COMPANY PARTICIPATES IN BOTH THE MASSACHUSETTS AND CONNECTICUT LIGHTING PROGRAMS] Now earlier I emailed you a table that shows you a record of the types of CFL and LED bulbs that we have records of you selling through the 2013 Connecticut Lighting Program. Does the table I sent to you seem correct in terms of the types and volume of CFLs & LED products you sold through the Connecticut ENERGY STAR Lighting Program?

a) [IF NO] [Record any corrections to the table]

2-4. Why did you choose to sell these particular products and packages through the Connecticut ENERGY STAR Lighting Program?

### Non-Program Sales

2-5. During 2013 did you sell Energy Star CFL non-specialty bulbs in Massachusetts that did not receive discounts from the Massachusetts ENERGY STAR Lighting Program? By non-specialty bulbs I mean basic spiral CFL bulbs.

a) [IF YES] Are the bulb types and packages different from those you sell through the Massachusetts ENERGY STAR Lighting Program?

a. [IF YES] How so?

b) [IF YES] Why didn't you sell these bulbs through the Massachusetts ENERGY STAR Lighting Program?

c) [ONLY IF MANUFACTURER] What sorts of distribution channels did you sell these non-specialty ENERGY STAR CFLs through?

2-6. [ONLY IF THEY SAID "YES" TO QUESTION 2-5] Please provide your best estimate of what % of non-specialty CFL bulbs that you sold in Massachusetts during 2013 fit into the following categories:

| | |
|---|---|
| First consider the non-specialty CFL bulbs that were discounted by the Massachusetts ENERGY STAR Lighting Program. About what % non-specialty CFL bulbs that you sold in Massachusetts during 2013 did these account for? | __% |
| Next consider the non-specialty CFL bulbs that met Energy Star specifications but were not discounted by the program. About what % of non-specialty CFL bulbs that you sold in Massachusetts during 2013 did these account for? | __% |
| **Total ENERGY STAR non-specialty CFL bulbs sold in Massachusetts during 2013** | **100%** |

2-7. During 2013 did you sell Energy Star specialty CFL bulbs in Massachusetts that did not receive discounts from the Massachusetts ENERGY STAR Lighting Program? By "specialty" CFL bulbs I mean bulbs that have special functions or features such as dimmability, three-way light levels, flood lighting, or CFLs that have non-spiral shapes such as A-lamps or globes.

a) [IF YES] Were these non-program specialty CFL bulb types and packages different from those you sell through the Massachusetts ENERGY STAR Lighting Program?

   a. [IF YES] How so?

b) [IF YES] Why didn't you sell these specialty CFLs through the Massachusetts ENERGY STAR Lighting Program?

c) [ONLY IF MANUFACTURER] What sorts of distribution channels did you sell these specialty CFLs through?

[ONLY IF THEY SAID "YES" TO QUESTION 2-7] Please provide your best estimate of what % of specialty CFL bulbs that you sold in Massachusetts during 2013 fit into the following categories:

| | |
|---|---|
| First consider the specialty CFL bulbs that were discounted by the Massachusetts ENERGY STAR Lighting Program. About what % of specialty CFL bulbs that you sold in Massachusetts during 2013 did these account for? | __% |
| Next consider the specialty CFL bulbs that met Energy Star specifications but were not discounted by the program. About what % of specialty CFL bulbs that you sold in Massachusetts during 2013 did these account for? | __% |
| **Total ENERGY STAR specialty CFL bulbs sold in Massachusetts during the 2013 period** | **100%** |

2-8. During 2013 did you sell LED bulbs in Massachusetts that did not receive discounts from the Massachusetts ENERGY STAR Lighting Program?

a) [IF YES] Were these LED bulbs different from those you sell through the Massachusetts ENERGY STAR Lighting Program?

a. [IF YES] How so?

b) [IF YES] Why didn't you sell these LED bulbs through the Massachusetts ENERGY STAR Lighting Program?

c) [ONLY IF MANUFACTURER] What sorts of distribution channels did you sell these LED bulbs through?

2-9. [ONLY IF THEY SAID "YES" TO QUESTION 2-9] Please provide your best estimate of what % of LED bulbs that you sold in Massachusetts during 2013 fit into the following categories:

| | |
|---|---|
| First consider the LED bulbs that were discounted by the Massachusetts ENERGY STAR Lighting Program. About what % of LED bulbs that you sold in Massachusetts during 2013 did these account for? | __% |
| Next consider the LED bulbs that were not discounted by the program. About what % of LED bulbs that you sold in Massachusetts during 2013 did these account for? | __% |
| **Total LED bulbs sold in Massachusetts during the 2013 period** | **100%** |

### T-12 sales

2-10. [ASK ONLY IF THEY IDENTIFIED THEM AS FAMILIAR WITH LINEAR FLUORESCENT LAMPS IN RESPONSE TO QUESTION 1-7, ELSE SKIP TO SECTION 3] Are you aware of federal laws that phased out the production of most types of T12 linear fluorescent lamps starting in July 2012? [IF THEY ARE UNFAMILIAR WITH THE LEGISLATION SKIP TO SECTON 3]

2-11. [MANUFACTURERS ONLY] Is your company still manufacturing T12 lamps?

a) [IF YES] Of the linear fluorescent lamps that your company currently manufactures, about what percent of these are T12 lamps? [RECORD %]

    a. What would this percentage have been four years ago before the new legislation [RECORD %]?

b) [IF YES] What changes did you make in the specifications for your T12 lamps to comply with this phase-out?

c) [IF YES] Why did your company decide to continue producing T12 lamps despite the phase-out?

d) [IF YES] Some of our research indicates that due to smaller production runs for these T12 lamps, it is more difficult to make margin on these lamps compared to other linear fluorescent lamp types such as T8s and T5s. Would you agree with that assessment?

    a. Why do you say that?

    b. [IF YES] If the margins are smaller on these T12 lamps, why does your company choose to continue manufacturing them?

e) [IF YES] At the moment, does your company have any plans to stop producing T12 lamps?

    a. [IF YES] What factors influenced your decision to stop producing T12 lamps?

    b. [IF NO] Why not?

f) [IF YES] Are you familiar with your company's sales of T12 lamps to the Massachusetts lighting market?

    a. [IF YES] What types of Massachusetts customers or markets are purchasing these T12 lamps?

    b. [IF YES] In the past year about what % of your total sales of linear fluorescents in Massachusetts were T12 lamps?

    c. [IF YES] In the coming year about what % of your total sales of linear fluorescents in Massachusetts do you expect to be T12 lamps?

g) [IF NO] In general, what types of customers or markets are purchasing these T12 lamps?

2-12. [RETAIL BUYERS IN THE HOME IMPROVEMENT/HARDWARE CHANNELS ONLY] Is your company still selling T12 lamps?

a) [IF YES] Why did your company decide to continue selling T12 lamps despite the phase-out?

b) [IF YES] Are you familiar with your company's sales of T12 lamps to the Massachusetts lighting market?

    a. [IF YES] What types of Massachusetts customers or markets are purchasing these T12 lamps?

    b. [IF NO] In general, what types of customers or markets are purchasing these T12 lamps?

c) [IF YES] Of the linear fluorescent lamps that your company currently sells, about what percent of these are T12 lamps? [RECORD %]

a. What would this percentage have been four years ago before the new legislation [RECORD %]?

2-13. Do you think this federal legislation encouraged some C&I customers to upgrade their T12 lighting to more energy-efficient lighting sooner than they otherwise would have?

a) [IF YES] Using a five-point scale where five indicates “very significant” and one indicates “very insignificant,” how significant do you think this federal legislation was in encouraging C&I customers to upgrade their T12 lighting to more energy-efficient lighting sooner than they otherwise would have?

2-14. [ALL RESPONDENTS] The federal legislation allowed customers to continue purchasing non-compliant T12 lamps after the July 2012 deadline if these lamps had been manufactured before the deadline. Do you know whether any of these “grandfathered” non-compliant T12 lamps are still being sold?

a) [IF THEY THINK THEY ARE STILL BEING SOLD] What information causes you to think that these non-compliant T12 lamps are still being sold?

b) [IF THEY THINK THEY ARE STILL BEING SOLD] Are there certain markets or distribution channels that which you think are more likely to still be selling these “grandfathered” non-compliant T12 lamps?

a. [IF YES] Which ones? [? [IF THEY INDICATED ABOVE THAT THEY HAVE MASSACHUSETTS-SPECIFIC T12 KNOWLEDGE, PROBE FOR MA-SPECIFIC MARKETS OR DISTRIBUTION CHANNELS]

c) [IF THEY THINK THEY ARE STILL BEING SOLD] For how much longer do you expect the supplies of these non-compliant T12 lamps to last?

## Section 3: 2013 Program Attribution

### Whether They Would Have Sold Any EE Lighting Products without the Program

3-1. MANUFACTURERS ONLY] My next questions are about the impact that the 2013 Massachusetts ENERGY STAR Lighting Program may have had on your Massachusetts CFL sales. During 2013 this program paid average buydown or markdown discounts of $1.35 per non-specialty CFL bulb and

$2.33 per specialty CFL bulb. Are there any retailers or retailer categories that you worked with through the 2013 Massachusetts ENERGY STAR Lighting Program that you think would not have been selling any CFL products if these discounts had not been available?

a) [IF YES] Which retailers or retailer categories?

b) [IF YES] Why do you say this?

c) [IF YES] If these retailers stopped selling CFL products in Massachusetts because the Massachusetts ENERGY STAR Lighting Program went away, do you think the majority of their customers would buy incandescent or halogen lighting products instead or just buy their CFLs from some other retailer?

    a. [IF SHOPPERS WOULD BUY CFLS FROM OTHER RETAILERS] What kind of retailers would these shoppers get their CFL products from instead?

d) [IF YES] Would your answer change depending on if we were talking about standard vs. specialty CFLs?

    a. [IF YES] How so?

e) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $1.35 per non-specialty CFL bulb and $3.24 per specialty CFL bulb. Are there any retailers or retailer categories that you worked with through the 2013 Connecticut lighting program that you think would not have been selling any CFL products if these discounts had not been available?

    a. [IF YES] Which retailers or retailer categories?

    b. [IF YES] Why do you say this?

3-2. [ONLY IF THEY SOLD LEDs THROUGH THE PROGRAM AND THEY ARE MANUFACTURERS] I have a similar question about the impact that the 2013 Massachusetts ENERGY STAR Lighting Program may have had on your Massachusetts LED product sales. During 2013 this program paid average buydown or markdown discounts of $11.62 LED per bulb. Are there any retailers or retailer categories that you worked with through the 2013 Massachusetts ENERGY STAR Lighting Program that you think would not have been selling any LED bulbs in Massachusetts if these discounts had not been available?

a) [IF YES] Which retailers or retailer categories?

b) [IF YES] Why do you say this?

c) [IF YES] If these retailers stopped selling LED bulbs in Massachusetts because the Massachusetts ENERGY STAR Lighting Program went away, do you think the majority of their customers would buy non-LED bulbs or just buy their LEDs from some other retailer?

a. [IF SHOPPERS WOULD BUY LEDS FROM OTHER RETAILERS] What kind of retailers would these shoppers get their LED products from instead?

b. [IF NON-LED BULBS] What types of non-LED bulbs do you think these customers would be most likely to buying?

d) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $10 per LED bulb. Are there any retailers or retailer categories that you worked with through the 2013 Connecticut lighting program that you think would not have been selling any LED products in Massachusetts if these discounts had not been available?

a. [IF YES] Which retailers or retailer categories?

b. [IF YES] Why do you say this?

3-3. [RETAIL LIGHTING BUYERS ONLY] My next questions are about the impact that the 2013 Massachusetts ENERGY STAR Lighting Program may have had on your Massachusetts CFL product sales. During 2013 this program paid average buydown or markdown discounts of $1.35 per non-specialty CFL bulb and $2.33 per specialty CFL bulb. Do you think your company would have been selling any CFL products in Massachusetts if these discounts had not been available?

a) [IF NO] Why do you say this?

b) [IF NO] If your company stopped selling CFL products in Massachusetts because the Massachusetts ENERGY STAR Lighting Program went away, do you think the majority of your customers would buy incandescent or halogen lighting products instead or just buy their CFLs from some other retailer?

a. [IF SHOPPERS WOULD BUY CFLS FROM OTHER RETAILERS] What kind of retailers would these shoppers get their CFL products from instead?

c) [IF NO] Would your answer change depending on if we were talking about standard vs. specialty CFLs?

a. [IF YES] How so?

d) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $1.35 per non-specialty CFL bulb and $3.24 per specialty CFL bulb. Do you think you would have been selling any CFL products in Connecticut if these discounts had not been available?

   a. [IF NO] Why do you say this?

3-4. [ONLY IF THEY SOLD LEDs THROUGH THE PROGRAM AND THEY ARE RETAIL LIGHTING BUYERS] I have a similar question about the impact that the 2013 Massachusetts ENERGY STAR Lighting Program may have had on your Massachusetts LED bulb sales. During 2013 this program paid average buydown or markdown discounts of $11.62 LED bulb. Do you think your company would have been selling any LED bulbs in Massachusetts if these discounts had not been available?

a) [IF NO] Why do you say this?

b) [IF NO] If your company stopped selling LED bulbs in Massachusetts because the Massachusetts ENERGY STAR Lighting Program went away, do you think the majority of your customers would buy non-LED lighting products or just buy their LEDs from some other retailer?

   a. [IF SHOPPERS WOULD BUY LED FROM OTHER RETAILERS] What kind of retailers would these shoppers get their LED products from instead?

c) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $10 per LED bulb. Do you think your company would have been selling any LED bulbs in Connecticut if these discounts had not been available?

   a. [IF YES] Which retailers or retailer categories?

   b. [IF YES] Why do you say this?

## Free Ridership – Non-Specialty CFLs

3-5. [MANUFACTURER ONLY] [INSTRUCTIONS TO SURVEYOR: FIRST ASK THE MANUFACTURER THE FREE RIDERSHIP QUESTION SEQUENCE FOR THE RETAILER CATEGORY THROUGH WHICH THEY SOLD THE MOST CFLS THROUGH THE PROGRAM (SEE TRACKING DATA MATRIX). EXCLUDE ANY RETAILER CATEGORIES THAT THEY IDENTIFIED IN QUESTION 3-1 AS NOT SELLING ANY CFL PRODUCTS AT ALL WITHOUT THE BUYDOWNS. REPEAT THE FREE RIDERSHIP BATTERY FOR ALL

RETAIL CHANNELS WHICH ACCOUNTED FOR AT LEAST 20% OF THEIR TOTAL PROGRAM SALES OR FOR ANY SUBCHANNELS PRE-IDENTIFIED AS “HARD-TO-REACH”]

According to our records, in 2013 you received Massachusetts ENERGY STAR lighting program buydown/ markdown discounts that averaged $1.35 per ENERGY STAR non-specialty CFL bulb through [RETAILER CATEGORY] such as [NAME RETAILER EXAMPLE]. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs through [RETAILER CATEGORY] stores in Massachusetts would have been about the same, lower, or higher?

a) [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-5c]

b) [IF LOWER] By what percentage do you estimate your Massachusetts sales of Energy Star non-specialty CFL bulbs through [RETAILER CATEGORY] would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

    a. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION 3-5b] % lower without the program support. So if you actually sold 100 non-specialty CFLs in a given week, you think you’d have sold only about [100 – (PERCENTAGE FROM QUESTION 3-5b. * 100)] in that period if the markdowns/ buydowns hadn’t been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

c) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $1.35 per non-specialty CFL bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs through [RETAILER CATEGORY] stores in Connecticut would have been about the same, lower, or higher?

    a. [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-7]

    b. [IF LOWER] By what percentage do you estimate your Connecticut sales of Energy Star non-specialty CFL bulbs through [RETAILER CATEGORY] would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

        i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION3-5 c) b. % lower without the program support. So if you actually sold 100 non-specialty CFLs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION3-5 c) b.]* 100)] in that period if the buydowns/markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

[REPEAT MA/CT QUESTION BATTERIES FOR ALL RETAIL CHANNELS WHICH ACCOUNTED FOR AT LEAST 20% OF THE SUPPLIER'S TOTAL PROGRAM SALES]

3-6. [RETAIL LIGHTING BUYERS ONLY] According to our records, in 2013 you sold ENERGY STAR non-specialty CFL bulbs that received Massachusetts ENERGY STAR lighting program buydown/ markdown discounts that averaged $1.35 per bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs in Massachusetts would have been about the same, lower, or higher?

a) [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-6c]

b) [IF LOWER] By what percentage do you estimate your Massachusetts sales of Energy Star non-specialty CFL bulbs would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION % lower without the program support. So if you actually sold 100 non-specialty CFLs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-6 b) * 100)] in that period if the buydowns/markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

c) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $1.35 per non-specialty CFL bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs in Connecticut would have been about the same, lower, or higher?

a. [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-8]

b. [IF LOWER] By what percentage do you estimate your Connecticut sales of Energy Star non-specialty CFL bulbs would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION3-6 c) b.] % lower without the program support. So if you actually sold 100 non-specialty CFLs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-6 c) b. ] * 100)] in that period if the buydowns/markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

## Free Ridership – Specialty CFLs

3-7. [MANUFACTURER ONLY] [INSTRUCTIONS TO SURVEYOR: FIRST ASK THE MANUFACTURER THE FREE RIDERSHIP QUESTION SEQUENCE FOR THE RETAILER CATEGORY THROUGH WHICH THEY SOLD THE MOST CFLS THROUGH THE PROGRAM (SEE TRACKING DATA MATRIX). EXCLUDE ANY RETAILER CATEGORIES THAT THEY IDENTIFIED IN QUESTION 3-1 AS NOT SELLING ANY CFL PRODUCTS AT ALL WITHOUT THE BUYDOWNS. REPEAT THE FREE RIDERSHIP BATTERY FOR ALL RETAIL CHANNELS WHICH ACCOUNTED FOR AT LEAST 20% OF THE SUPPLIER'S PROGRAM SALES. OR FOR ANY SUBCHANNELS PRE-IDENTIFIED AS "HARD-TO-REACH"]

According to our records, in 2013 you received Massachusetts ENERGY STAR lighting program buydown/ markdown discounts that averaged $2.33 per ENERGY STAR specialty CFL bulb through [RETAILER CATEGORY] such as [NAME RETAILER EXAMPLE]. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs through [RETAILER CATEGORY] stores in Massachusetts would have been about the same, lower, or higher?

a) [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-7C]

b) [IF LOWER] By what percentage do you estimate your Massachusetts sales of Energy Star specialty CFL bulbs through [RETAILER CATEGORY] would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION3-7 b)] % lower without the program support. So if you actually sold 100 specialty CFLs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-7 b). * 100)] in that period if the buydowns or markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

c) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $3.24 per specialty CFL bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs through [RETAILER CATEGORY] stores in Connecticut would have been about the same, lower, or higher?

a. [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-9]

b. [IF LOWER] By what percentage do you estimate your Connecticut sales of Energy Star specialty CFL bulbs would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION] % lower without the program support. So if you actually sold 100 specialty CFLs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-7 b) .c * 100)] in that period if the buydowns/markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

[REPEAT MA/CT QUESTION BATTERIES FOR ALL RETAIL CHANNELS WHICH ACCOUNTED FOR AT LEAST 20% OF THE SUPPLIER'S PROGRAM SALES]

3-8. [RETAIL LIGHTING BUYERS ONLY] According to our records, in 2013 you sold ENERGY STAR specialty CFL bulbs that received Massachusetts ENERGY STAR lighting program buydown/ markdown discounts that averaged $2.33 per bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of specialty CFLs in Massachusetts would have been about the same, lower, or higher?

a) [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-8c]

b) [IF LOWER] By what percentage do you estimate your Massachusetts sales of Energy Star specialty CFL bulbs would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

   a. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION 3-8 b)] % lower without the program support. So if you actually sold 100 specialty CFLs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-8 b). * 100)] in that period if the manufacturer buydowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

c) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $3.24 per specialty CFL bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs in Connecticut would have been about the same, lower, or higher?

   a. [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-10]

   b. [IF LOWER] By what percentage do you estimate your Connecticut sales of Energy Star specialty CFL bulbs would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

      i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION 3-8 b)] % lower without the program support. So if you actually sold 100 specialty CFLs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-8 b) * 100)] in that period if the buydowns/markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

## Free Ridership – LEDs

3-9. [MANUFACTURER ONLY] [INSTRUCTIONS TO SURVEYOR: FIRST ASK THE MANUFACTURER THE FREE RIDERSHIP QUESTION SEQUENCE FOR THE RETAILER CATEGORY THROUGH WHICH THEY SOLD THE MOST LEDS THROUGH THE PROGRAM (SEE TRACKING DATA MATRIX). EXCLUDE ANY RETAILER CATEGORIES THAT THEY IDENTIFIED IN QUESTION 3-2 AS NOT SELLING ANY LED BULBS AT ALL WITHOUT THE BUYDOWNS. REPEAT THE FREE RIDERSHIP BATTERY FOR ALL RETAIL CHANNELS WHICH ACCOUNTED FOR AT LEAST 20% OF THE SUPPLIER'S PROGRAM SALES]

According to our records, in 2013 you received Massachusetts ENERGY STAR lighting program buydown/ markdown discounts that averaged $11.62 per LED bulb through [RETAILER CATEGORY] such as [NAME RETAILER EXAMPLE]. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs through [RETAILER CATEGORY] stores in Massachusetts would have been about the same, lower, or higher?

a) [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-9C]

b) [IF LOWER] By what percentage do you estimate your sales of LED bulbs through [RETAILER CATEGORY] would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

    a. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION 3-9b)] % lower without the program support. So if you actually sold 100 LED bulbs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-9b). * 100)] in that period if the buydowns or markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

c) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $10 per LED bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs through [RETAILER CATEGORY] stores in Connecticut would have been about the same, lower, or higher?

    a. [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-10]

    b. [IF LOWER] By what percentage do you estimate your sales of LED bulbs would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

        i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION 3-9c)b.] % lower without the program support. So if you actually sold 100 LED bulbs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-9c)b * 100)] in that period if the buydowns/markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

[REPEAT MA/CT QUESTION BATTERIES FOR ALL RETAIL CHANNELS WITH SIGNIFICANT PROGRAM SALES]

3-10. Do you think LED lighting product prices will increase, decrease, or stay the same in 2015?

a) What factors are causing you to make this prediction?

b) [IF SAID PRICES WILL DROP] By what percentage do you think LED prices will drop in 2015? [RECORD %]

3-11. [ONLY IF THEY ARE A MANUFACTURER AND SAID THEIR LED SALES WOULD DROP ABSENT THE PROGRAM IN RESPONSE TO 3-9B] You said that in 2013 your sales of Massachusetts LED bulbs would have declined [% IN RESPONSE TO 3-9b] absent the program. You said that you expected LED prices to drop [% from 3-10] in 2015. Assuming that prices for your own LED products follow the market trend, and assuming that the Massachusetts ENERGY STAR lighting program continues to offer buydowns or markdowns at about the same percentage LED total bulb costs as they do now. In that scenario, how much would your Massachusetts LED bulb sales drop in 2015 if the program went away? [RECORD % DECLINE ABSENT PROGRAM IN 2015 SCENARIO]

a) Why do you say that?

3-12. [IF THEY ARE A MANUFACTURER AND THEY PARTICIPATE IN THE CONNECTICUT PROGRAM] Would your response to this question (3-11) be any different for your Connecticut sales of LED products?

a) [IF YES] You said that in 2013 your sales of Connecticut LED bulbs would have declined [% IN RESPONSE TO 3-9.c.b.] absent the program. You said that you expected LED prices to drop [% from 3-10] in 2015. Assuming that prices for your own LED products follow the market trend, and assuming that the Connecticut lighting program continues to offer buydowns or markdowns at about the same percentage of LED total bulb costs as they do now. In that scenario, how much would your Connecticut LED bulb sales drop in 2015 if the program went away? [RECORD % DECLINE ABSENT PROGRAM IN 2015 SCENARIO]

i. Why do you say that?

3-13. [RETAIL LIGHTING BUYERS ONLY] According to our records, in 2013 you sold LED bulbs that received Massachusetts ENERGY STAR lighting program buydown/ markdown discounts that averaged $11.62 per bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of LED bulbs in Massachusetts would have been about the same, lower, or higher?

a) [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-13C]

b) [IF LOWER] By what percentage do you estimate your sales of LED bulbs in Massachusetts would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

   a. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION 3-13 b)] % lower without the program support. So if you actually sold 100 LED bulbs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-13 b). * 100)] in that period if the manufacturer buydowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

c) [IF THEY ALSO PARTICIPATED IN THE CONNECTICUT PROGRAM] You also participated in the Connecticut energy-efficient lighting program in 2013. This program paid average buydown or markdown discounts of $10 per LED bulb. If these program buydown/ markdown discounts and program promotional materials had not been available during 2013, do you think your sales of these types of bulbs in Connecticut would have been about the same, lower, or higher?

   a. [IF THE SAME OR HIGHER] Why do you say this? [RECORD RESPONSE AND THEN SKIP TO 3-14]

   b. [IF LOWER] By what percentage do you estimate your sales of LED bulbs in Connecticut would be lower during 2013 if these program buydowns/ markdowns and program promotional materials had not been available? [RECORD % DECREASE]

      i. I want to make sure I understand you correctly. You estimate that your sales would have been [PERCENTAGE FROM QUESTION 3-13 c) b.] % lower without the program support. So if you actually sold 100 LED bulbs in a given week, you think you'd have sold only about [100 – (PERCENTAGE FROM QUESTION 3-13 c) b.. * 100)] in that period if the buydowns/markdowns hadn't been available? [IF RESPONSE IS ≠ YES, THEN CLARIFY ESTIMATED SALES DECREASE]

3-14. [RETAIL BUYERS ONLY] You said that in 2013 your sales of LED bulbs would have declined [% IN RESPONSE TO 3-13b] absent the program. You said that you expected LED prices to drop [% from 3-10] in 2015. Assuming that prices for your own LED products follow the market trend, and assuming that the Massachusetts ENERGY STAR lighting program continues to offer buydowns or markdowns at about the same percentage of LED bulb total costs as they do now. In that scenario, how much would your Massachusetts LED bulb sales drop in 2015 if the program went away? [RECORD % DECLINE ABSENT PROGRAM IN 2015 SCENARIO]

a) Why do you say that?

3-15. [IF THEY ARE A RETAIL BUYER AND THEY PARTICIPATE IN THE CONNECTICUT PROGRAM] Would your response to this question (3-14) be any different for your Connecticut sales of LED products?

a) [IF YES] You said that in 2013 your sales of Connecticut LED bulbs would have declined [% IN RESPONSE TO 3-13.c.b.] absent the program. You said that you expected LED prices to drop [% from 3-10] in 2015. Assuming that prices for your own LED products follow the market trend, and assuming that the Connecticut lighting program continues to offer buydowns or markdowns at about the same percentage of LED bulb total costs as they do now. In that scenario, how much would your Connecticut LED bulb sales drop in 2015 if the program went away? [RECORD % DECLINE ABSENT PROGRAM IN 2015 SCENARIO]

3-16. Besides the discounts and the promotional materials, do you think the Massachusetts ENERGY STAR Lighting Program does anything else that impacts the sale of Energy Star CFLs and LED bulbs?

a) [IF YES] What else does the program do, and what impact does it have on the sale of these bulbs? [PROBE FOR EACH BULB TYPE]

## Section 4: Lighting Market Trends and Program Design

This last set of questions will address lighting market trends and aspects of the Massachusetts ENERGY STAR Lighting Program’s design.

### The Impacts of the EISA Legislation

4-1. In 2007, the Energy Independence and Securities Act, otherwise known as “EISA”, was passed that requires new efficiency standards for light bulbs. Are you familiar with this legislation? [IF NO, SKIP TO 4-12]

4-2. [RETAIL BUYERS ONLY] Has your company changed stocking practices in Massachusetts as a result of EISA?

a) [IF YES] How so?

4-3. In your opinion, what has been the impact of this energy legislation on CFL sales? [PROBE: Increase/decrease/no change? For what reasons? Any other impacts?]

4-4. What has been the impact of this energy legislation on sales of EISA-compliant halogen bulbs? [PROBE: Increase/decrease/no change? For what reasons? Any other impacts?]

4-5. What has been the impact of this energy legislation on sales of LED bulbs? [PROBE: Increase/decrease/no change? For what reasons? Any other impacts?]

4-6. Are you aware of any continuing availability of traditional incandescent bulbs?

a) [IF YES] What wattages of bulbs are you seeing?

b) [IF YES] In what retail channels are these being sold?

c) Why are stores still selling these incandescents?

4-7. Have you seen any evidence of consumer hoarding of traditional incandescent bulbs?

a) [IF YES] How widespread is it?

4-8. What do you expect will be the future effects of this act on?

a) CFL? [Probe for future sales/stocking and prices]?

b) EISA-compliant halogen bulbs [Probe for future sales/stocking and prices]?

c) LED bulbs [Probe for future sales/stocking and prices]?

4-9. Have you seen much consumer reaction to EISA?

a) [IF YES] Would you describe it as positive, negative, or indifferent?

4-10. Are you aware of any efforts to educate consumers about lighting choices and the EISA legislation?

a) [IF YES] Which efforts are you aware of? [IF THEY SERVE BOTH MA AND CT, ASK THEM TO DISTINGUISH BETWEEN THE EDUCATIONAL EFFORTS OF THESE TWO STATES]

b) [IF YES] In your opinion, how effective have these consumer education efforts been?

4-11. Do you have any suggestions on the best ways to educate consumers about lighting choices and the EISA legislation?

a) [IF YES] Which suggestions do you have?

### The LED Market

4-12. [IF SELLING LED BULBS] Was your company selling LED bulbs in Massachusetts before getting involved with the Massachusetts ENERGY STAR Lighting Program? [IF THEY ALSO SELL IN CT, REPEAT QUESTION FOR CT]

4-13. [IF SELLING LED BULBS] Has your participation in the Massachusetts ENERGY STAR Lighting Program impacted your decision to start selling LED lighting products? [IF THEY ALSO SELL IN CT, REPEAT QUESTION FOR CT]

a) [IF YES] How so?

b) [IF NO] Why not?

4-14. [IF SELLING LED BULBS] Has your participation in the Massachusetts ENERGY STAR Lighting Program affected the types of LED lighting products you are choosing to sell? [IF THEY ALSO SELL IN CT, REPEAT QUESTION FOR CT]

a) [IF YES] How so?

b) [IF NO] Why not?

4-15. What are the most important factors that are limiting customer demand for LED products? Please explain.

a) To what degree have these demand barriers varied with the type of LED product?

b) [IF DEMAND BARRIERS IDENTIFIED] Has there been any progress recently to reduce these barriers?

a. [IF YES] What factors lead to the reduced barriers?

c) [IF DEMAND BARRIERS IDENTIFIED] What needs to happen to overcome these demand-side barriers?

4-16. [IF NOT SELLING LED BULBS] What factors have influenced your decision to not sell LED bulbs?

4-17. [IF NOT SELLING LED BULBS] Do you plan to sell LED bulbs in the near future?

a) [IF YES] Which bulbs? When do you plan on selling?

b) [IF NO] Why not?

### Program Design – Program Preferences for Products and Retail Channels

4-18. Are there certain types of the energy-efficient lighting products that you think the Massachusetts ENERGY STAR Lighting Program should be promoting that they are not currently promoting?

4-19. Are there certain types of retailers that you think the Massachusetts ENERGY STAR Lighting Program should be focusing on more to encourage their sales of energy-efficient lighting products?

a) [IF YES] Which types of retailers?

4-20. The Massachusetts ENERGY STAR Lighting Program is trying to increase the penetration of energy-efficient lighting technologies in so-called 'hard-to-reach" lighting markets. The program has in the past defined these 'hard-to-reach' lighting markets as those that serve low-income, ethnic, non-English-speaking, and less educated customers. The program is trying to reach these customers through discount stores and small or ethnic grocery stores.

a) First of all do you agree with that definition of hard-to-reach lighting markets?

a. [IF NO] How would you define the hard-to-reach lighting markets in Massachusetts?

b) Do you think these are the right kinds of retailers that the program should be working with to make CFLs more accessible to hard-to-reach customers?

   a. [IF NOT] Why not? [PROBE FOR WHICH ALTERNATIVE RETAILERS THEY SUGGEST]

4-21. As noted, the Massachusetts ENERGY STAR Lighting Program is encouraging the sale of energy-efficient lighting products through discount stores and small/ethnic grocery stores. To what degree do you think these discount and small/ethnic grocery stores are creating new Energy Star CFL product sales as opposed to taking away Energy Star CFL sales that otherwise would have gone to national chain retailers such as Wal-Mart, Home Depot, or Lowe's?

a) [IF RESPONDENT INDICATES THESE GROCERY OR DISCOUNT STORES MAY BE TAKING SALES FROM OTHER RETAILERS] Which retailers do you think these discount stores and small/ethnic grocery stores are taking Energy Star CFL product sales away from?

b) What percentage of the 2013 CFL sales in these discount and small/ethnic grocery stores represented new sales that were not shifted from other channels?

## Program Design – Market Lift

4-22. Has your business participated in any market lift programs for CFLs? [IF NECESSARY, SAY: "A MARKET LIFT STRATEGY INVOLVES INCENTIVIZING MARKET ACTORS (RETAILERS AND WHOLESALERS) TO INCREASE THEIR SALES OF A PRODUCT ABOVE A PRE-ESTABLISHED BASELINE."]

a) [IF YES] How did participation in these market lift programs work out for your company? [PROBES: THE PROCESS OF PARTICIPATING; SALES AND PROFITS; IF NOT ALREADY MENTIONED, PROBE FOR MA MARKET LIFT PROGRAM IN PARTICULAR]

b) [IF NO] Did you consider participating in a CFL market lift program but in the end decide not to participate? [IF NOT ALREADY MENTIONED, PROBE FOR MA MARKET LIFT PROGRAM IN PARTICULAR]

   a. [IF YES, CONSIDERED BUT DECIDED NOT TO] Why did you decide not to participate?

4-23. Do you believe there are [IF YES TO 4-23 OR 4-23b, READ: "still"] opportunities for your business to implement a Market Lift strategy for CFLs?

4-24. What are the advantages or disadvantages of this market lift program design approach?

4-25. The majority of market lift pilot programs have focused their efforts increasing sales of CFLs. Do you think LEDs are viable candidates for market lift-style program designs?

a) Why or why not? [PROBES: RAPIDLY CHANGING MARKET --NEW PRODUCT INTRODUCTIONS, FALLING PRICES, LARGE INCREASES IN SALES?]

4-26. Do you also supply bulbs to California or New York?

a) [IF YES] Have you noticed any differences in the sales trends of CFL bulbs in these/this state(s) compared to Massachusetts?

a. [IF YES] What differences/trends have you noticed?

b. [IF YES] How do you account for these differences?

4-27. [IF YES] Have you noticed any differences in the sales trends of LED bulbs in these/this state(s) compared to Massachusetts?

a) [IF YES] What differences/trends have you noticed?

b) [IF YES] How do you account for these differences?

## Section 5: Program Satisfaction

Finally, I would like to find out your level of satisfaction with the Massachusetts ENERGY STAR® Lighting Program.

### Satisfaction with Program Staff and Program as a Whole

5-1. Using a scale of 0 to 10 where 10 = very satisfied and 0 = very dissatisfied, how satisfied have you been with the program managers, contractor and other staff involved in delivering the Massachusetts ENERGY STAR® Lighting Program? [OBTAIN SEPARATE SATISFACTION RATING FOR CT PROGRAM IF THEY PARTICIPATED IN BOTH]

a) [ASK ONLY IF SATISFACTION RATING IS 0-5] Why do you say that?

5-2. Using the same scale, how would you rate your level of satisfaction with the program in general? [OBTAIN SEPARATE SATISFACTION RATING FOR CT PROGRAM IF THEY PARTICIPATED IN BOTH]

a) [ASK ONLY IF SATISFACTION RATING IS 0-5] Why do you say that?

5-3. In what way could the program processes be improved? [OBTAIN SEPARATE RECOMMENDATIONS FOR MA AND CT PROGRAMS IF THEY PARTICIPATED IN BOTH]

5-4. Are you planning to participate in the program going forward? [OBTAIN SEPARATE RESPONSE FOR MA AND CT PROGRAMS IF THEY PARTICIPATED IN BOTH]

a) [IF YES] Why do you say that?

5-5. [IF THEY PARTICIPATED IN CT PROGRAM ALSO] Would your level of satisfaction be any different for the Connecticut lighting program?

a) [IF YES] Why do you say that?

5-6. [IF THEY ONLY PARTICIPATED IN ONE OF THE STATE PROGRAMS] We have you listed as participating in [MA/CT PROGRAM] but not [MA/CT PROGRAM]? Why has your company chosen to participate in [MA/CT PROGRAM] but not [MA/CT PROGRAM]?

5-7. Are you planning to participate in the program going forward? [OBTAIN SEPARATE RESPONSE FOR MA AND CT PROGRAMS IF THEY PARTICIPATED IN BOTH]

# Appendix C: Massachusetts ENERGY STAR Retail Store/Product Manager Survey Codebook

NOTE:

- Variable names are in bold type, and are in the same order as the dataset. Variables that are not in bold type indicate questions that were dropped from the dataset, but included in the survey.
- A code of (-4) means and interviewing error that resulted in a question being skipped
- A code of (-5) means programming change (i.e., skip pattern changed during fielding).
- A code of (-6) means programmed skip (i.e., a skip that was purposely programmed based on skip patterns)
- A code of (-97) means don't know.
- A code of (-98) means refused.
- Questions were asked of all respondents unless indicated otherwise.

**SURVEY FILES**

Data file: MassRetailer2014_Data_25July14.sav

**SAMPLE VARIABLES**

| | |
|---|---|
| **CASEID** | Unique case identification number |
| **PANAME** | Name of Program Administer |
| **COMPANY** | Retail Store |
| **CHANNEL** | Type of retail store |
| **SUPPLIER** | Lighting Supplier |

**STCFLDB** Store sells standard CFLs through the program

| | |
|---|---|
| 0 | Does not sell |
| 1 | Does sell |

**SPCFLDB** Store sells specialty CFLs through the program

| | |
|---|---|
| 0 | Does not sell |
| 1 | Does sell |

**LEDBLBDB** Store sells LEDs through the program

| | |
|---|---|
| 0 | Does not sell |
| 1 | Does sell |

**LEDFXDB** Store sells LED fixtures through the program

| | |
|---|---|
| 0 | Does not sell |
| 1 | Does sell |

| | |
|---|---|
| **Retailer_Phone** | Retailer phone number |
| **Retailer_Address** | Retailer address |
| **Retailer_City** | Retailer city |
| **Retailer_State** | Retailer state |
| **Retailer_Zip** | Retailer zip code |

**FINDING THE DECISION MAKER**

**I1** *[IF CONTACT NAME IS BLANK THEN SKIP TO I2]*
Hello, may I please speak with *[USE CONTACT NAME, IF AVAILABLE]*?

1 Contact available *[SKIP TO I4]*

2 Contact currently unavailable *[ARRANGE CALL BACK]*

3 Contact no longer works there *[SKIP TO I2]*

-6 Program skip

**I2** According to our records, your store is participating in a Massachusetts Energy Star lighting program which provides price discounts on energy-efficient lighting products such as CFLs and LEDs. The Massachusetts electric utilities and the Cape Light Compact run this program. I'd like to speak with someone in your store who deals with stocking and supplying your lighting products such as light bulbs

*[IF THEY WANT VERIFICATION OF THE LEGITIMACY OF THE RESEARCH, TELL THEM TO CALL MATT NELSON OF NSTAR AT (781) 441-3456*

*[IF THEY WANT TO KNOW HOW LONG THE SURVEY IS, SAY: "ABOUT 15-20 MINUTES."]*

1 Person responsible available *[SKIP TO I4]*

2 Person responsible currently unavailable *[ARRANGE CALL BACK]*

3 No person responsible for stocking or management of lighting products

*[SKIP TO I2A]*

-6 Program skip

**I2A** May I speak with the store manager?

1 Yes

2 Not Available *[SET CALLBACK]*

**I3** *[If I2≠3 & I2≠97, SKIP]* I understand you're the store manager. Are you familiar with the stocking patterns or sales trends for the lighting products that you sell?

*[IF THEY ASK WHY, SAY: "ACCORDING TO OUR RECORDS, YOUR STORE IS PARTICIPATING IN A MASSACHUSETTS ENERGY STAR LIGHTING PROGRAM WHICH PROVIDES PRICE DISCOUNTS ON ENERGY-EFFICIENT LIGHTING PRODUCTS SUCH AS CFLS AND LEDS. THE MASSACHUSETTS ELECTRIC UTILITIES AND THE CAPE LIGHT COMPACT RUN THIS PROGRAM."]*

*[IF THEY WANT VERIFICATION OF THE LEGITIMACY OF THE RESEARCH, TELL THEM TO CALL MATT NELSON OF NSTAR AT (781) 441-3456]*

*[IF THEY ASK WHO THE ADMINISTRATORS ARE, READ 'CAPE LIGHT COMPACT, NATIONAL GRID, NSTAR, UNITIL AND WESTERN MASSACHUSETTS ELECTRIC.']*

1 Yes *[SKIP TO I4]*

2 No *[SKIP TO I3B]*

**I3A_OPN** *[RECORD NAME]* __________________

**I3B** Who would be familiar with sales and stocking trends for lighting products in your store?

1 Contact Name and Number Given *[SPECIFY; SKIP TO I4 WITH NEW CONTACT]*

2 No Contact Info Provided *[THANK AND TERMINATE]*

**I3B_OPN** *[RECORD NAME OF NEW CONTACT]* ________________

**I4** Hello I am __________ from Tetra Tech. I am calling on behalf of *[PA Name and]* the Massachusetts ENERGY STAR lighting program. According to our records, your store recently participated in this program by selling discounted CFLs or LED bulbs from *[SUPPLIER]*. Are you familiar with this program?

1 Yes *[SKIP TO Intro3]*

2 No

**I5** Who would be familiar with this program?

1 *[RECORD NAME AND PHONE NUMBER*] __________ *[THANK AND TERMINATE THEN CALL BACK CONTACT IDENTIFIED IN RESPONSE TO QUESTION I5 AND REPEAT QUESTION I4]*

2 Transferred to new respondent and returned to I4

-6 Program skip

**Intro3** For quality control and training purposes this call will be recorded.

**I6** What is your job title? *[DO NOT READ]*

1 Store manager

2 Manager

3 Assistant manager

4 General merchandise manager

5 Store director

6 Other *[SPECIFY]*

**I6_OPN** Other job title.

**I6AB** About how many months or years have you been working with the sale of lighting products?

**I6A** *[RECORD # OF MONTHS]* ____

-97 Don't know/Not sure/Can't remember

**I6B** *[RECORD # OF YEARS]* ____

-97 Don't know/Not sure/Can't remember

**I7** Now I'm going to use the abbreviation "CFL" to refer to compact fluorescent lamps. Are you the primary person who decides how many discounted CFLs your store(s) receives in shipments from <*SUPPLIER*> as part of this Massachusetts ENERGY STAR lighting program?

1 Yes *[SKIP TO P1]*

2 No

**I8** Who is the primary decision-maker?

*[RECORD NAME AND PHONE NUMBER, PROCEED TO P1. CONTACT INFORMATION MAY BE USED IN A LATER SURVEY]* __________________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**I8_OPN** Name and phone number of primary decision-maker

**PARTICIPATION INFORMATION**

**P1INTRO** I would first like to gather some information about the lighting products that you sell

**P1** *[IF <STCFLDB> =1 SKIP TO P2]* In 2013 did your store sell standard CFLs? By standard CFLs I mean bulbs that have spiral shapes, are not covered, and which do not have any special features such as dimmability or three-way capability?

1 Yes

2 No *[SKIP TO P4]*

-97 Don't know/Not sure/Can't remember *[SKIP TO P4]*

-6 Program skip

**P2** *[IF <STCFLDB> = 0 SKIP TO P4]* In 2013 did your store sell standard CFLs that have not been discounted by the Massachusetts ENERGY STAR lighting program?

1 Yes

2 No *[SKIP TO P4]*

-97 Don't know/Not sure/Can't remember *[SKIP TO P4]*

-6 Program skip

**P3_** *[IF <STCFLDB> ≠ 0 AND P2 =1 ELSE SKIP TO P4]* Roughly what percent of the standard CFLs that your store sold during the 2013 period were discounted by the Massachusetts ENERGY STAR lighting program and what percent were not? *[NOTE THE TWO PERCENTAGES SHOULD ADD UP TO 100%]*

**P3** % DISCOUNTED BY MA ES PROGRAM

*[RECORD PERCENTAGE]*__________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**P3A** % NOT PROGRAM DISCOUNTED

*[RECORD PERCENTAGE]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**P4** *[IF <SPCFLDB> = 1 SKIP TO P5]* In 2013 did your store sell specialty CFLs that do not have the spiral shape, like A-shape or globe-shape lamps, or CFLs with special features such as dimmable, 3-way, or reflector CFLs?

1 Yes

2 No *[SKIP TO P7]*

-97 Don't know/Not sure/Can't remember *[SKIP TO P7]*

-6 Program skip

**P5** *[IF <SPCFLDB> = 0 SKIP TO P7]* In 2013 did your store sell specialty CFLs that have not been discounted by the Massachusetts ENERGY STAR lighting program? *[IF THEY WERE NOT ASKED P4, SAY: "BY SPECIALTY CFLs I MEAN THOSE THAT DO NOT HAVE THE SPIRAL SHAPE, LIKE A-SHAPE OR GLOBE-SHAPE LAMPS, OR CFLS WITH SPECIAL FEATURES SUCH AS DIMMABLE, 3-WAY, OR REFLECTOR CFLS."]*

1 Yes

2 No *[SKIP TO P7]*

-97 Don't know/Not sure/Can't remember *[SKIP TO P7]*

-6 Program skip

P6_ *[IF <SPCFLDB> ≠ 0 AND P5 =1 ELSE SKIP TO P7]* Roughly what percent of the specialty CFLs that your store sold during the 2013 period were discounted by the Massachusetts ENERGY STAR lighting program and what percent were not? *[NOTE THE TWO PERCENTAGES SHOULD ADD UP TO 100%]*

**P6** % DISCOUNTED BY MA ES PROGRAM

*[RECORD PERCENTAGE]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**P6_2** % NOT PROGRAM DISCOUNTED

*[RECORD PERCENTAGE]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**P7** *[IF < LEDBLBDB> = 1 SKIP TO P7a]* In 2013 did your store sell LED bulbs? *[IF NECESSARY: "LED IS AN ABBREVIATION FOR "LIGHT-EMITTING DIODE."]*

1 Yes

2 No *[SKIP TO P11]*

-97 Don't know/Not sure/Can't remember *[SKIP TO P11]*

-6 Program skip

**P7A** Roughly how many LED bulbs did your store sell in 2013?

*[RECORD NUMBER OF LED BULBS]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

P7B What types of LED bulbs did your store sell in 2013? Do you sell… *[READ UNBRACKETED PRECODES AND SELECT ALL THAT APPLY]*

For P7B_1 through P7B_9

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -6 | Program skip |

| | |
|---|---|
| **P7B_1** | General Use LEDS, such as: A-lamp, Globes, typically medium base |
| **P7B_2** | Spotlight LEDs, such as: floodlight/ reflector LEDs e.g., BR-40, R-30, PAR-30, MR-16 LEDs |
| **P7B_3** | Decorative LEDs |
| **P7B_4** | Nightlight LEDS, such as: C-7 and C-9 LEDs |
| **P7B_5** | Holiday LEDs |
| **P7B_6** | Other *[SPECIFY]* |
| **P7B_7** | We don’t sell them |
| **P7B_8** | Don't know/Not sure/Can't remember |
| **P7B_9** | Refused |
| **P7B_opn** | Types of LED bulbs sold - Other, specify |

**P8** *[IF <LEDBLBDB> = 0 SKIP TO P9]* In 2013 did your store sell LED bulbs that have not been discounted by the Massachusetts ENERGY STAR lighting program?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO P11]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO P11]* |
| -6 | Program skip | |

P8B What types of LED bulbs did your store sell that did not receive Massachusetts ENERGY STAR lighting program discounts in 2013? *[DO NOT READ. SELECT ALL THAT APPLY]*

For P8B_1 through P8B_9

0 Not mentioned

1 Mentioned

-6 Program skip

**P8B_1** General Use LEDS, such as: A-lamp, Globes, typically medium base

**P8B_2** Spotlight LEDs, such as: floodlight/ reflector LEDs e.g., BR-40, R-30, PAR-30, MR-16 LEDs

**P8B_3** Decorative LEDs

**P8B_4** Nightlight LEDS, such as: C-7 and C-9 LEDs

**P8B_5** Holiday LEDs

**P8B_6** Other *[SPECIFY]*

**P8B_7** We don't sell them

**P8B_8** Don't know/Not sure/Can't remember

**P8B_9** Refused

**P8B_OPN** Other type of LED bulbs sold that did not receive program discounts

**P9_** *[IF <LEDBLBDB> =1 AND P8 =1 ELSE SKIP TO P10]* Roughly what percent of the screw-based LED bulbs that your store sold during the 2013 period were discounted by the Massachusetts ENERGY STAR lighting program and what percent were not? *[NOTE THE TWO PERCENTAGES SHOULD ADD UP TO 100%]*

**P9** % DISCOUNTED BY MA ES PROGRAM

*[RECORD PERCENTAGE]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**P9A** % NOT PROGRAM DISCOUNTED

*[RECORD PERCENTAGE]*_________

-6 Program skip

P10 What are the main reasons your store decided to sell LED light bulbs? *[DO NOT READ RESPONSES. ACCEPT MULTIPLE RESPONSES]*

For P10_1 through P10_8

0 Not mentioned

1 Mentioned

-6 Program skip

**P10_1** Corporate decision

**P10_2** Customer request/demand

**P10_3** Profit margin is good

**P10_4** Suppliers suggested we carry LED bulbs

**P10_5** Program influence/discount

**P10_6** Other *[SPECIFY]*

**P10_7** Don’t know

**P10_8** Refused

**P10_OPN** Other main reason store decided to sell LED light bulbs

**P11** ***[Program update 6/23/14 10 am – Option 2, DK, R should skip to P15E, not P19]*** Did your store sell hard-wired lighting fixtures in 2013? Please note that I am referring to hard-wired light fixtures, not plug-in fixtures or light bulbs

1 Yes

2 No *[SKIP TO P15E]*

-97 Don't know/Not sure/Can't remember *[SKIP TO P15E]*

**P12** Roughly how many total lighting fixtures did your store sell in 2013?

*[RECORD NUMBER OF LIGHTING FIXTURES]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**P12A** *[IF P12 = -97]* Would you say between …? *[READ; ONCE THEY HAVE IDENTIFIED A QUANTITY, THERE IS NO NEED TO READ FURTHER DOWN THE LIST]*

1 1-100

2 101-500

3 501-1,000

4 1,001-5,000

5 5,001-10,000

6 10,001 and above

-97 Don't know

-4 Interviewing error

-6 Program skip

**P13** About what percentage of your unit sales of hard wired fixtures are LED fixtures? *[IF NEEDED: "I'M REFERRING TO HARD-WIRED LIGHT FIXTURES, NOT PLUG-IN FIXTURES OR LIGHT BULBS."]*

*[RECORD PERCENTAGE]*_________

-97 Don't know/Not sure/Can't remember *[SKIP TO P14]*

-6 Program skip

**P14** ***[Program change 6/19/14 4pm Category 1 changed from 0-5% to 1-5%, category 7 added (0%)]*** *[IF P13 = -97]* Would you say between …?

1 1-5%

2 6-10%

3 11-25%

4 26-50%

5 51-75%

6 76-100%

7 0%

-97 Don't know *[SKIP TO P19]*

-6 Program skip

P15 ***[Program change 6/19/14 4pm skip added]*** *[Ask if P13>0 or P14<>7]* Roughly what percent of the LED light fixtures you sold were of the following types: *[PLEASE CHECK TO MAKE SURE TOTAL = 100%]*

**P15A** Portable indoor fixtures such as desk and floor lamps?

*[RECORD PERCENTAGE]*_________

-97 Don’t know

-6 Program skip

-4 Interviewing error

**P15B** Installed indoor fixtures such as recessed cans?

*[RECORD PERCENTAGE]*_________

-97 Don’t know

-6 Program skip

**P15C** Outdoor fixtures?

*[RECORD PERCENTAGE]*_________

-97 Don’t know

-6 Program skip

**P15D** Other LED fixture types *[PLEASE SPECIFY TYPE]*

*[RECORD PERCENTAGE]*_________

-97 Don’t know

-6 Program skip

**P15D_OPN** Other LED fixture type

**P15E** ***[Program change 6/19/14 4pm addition of skip criteria 'OR P14<>7']***

***[Program change 6/23/14 10 am to skip, P7=1, instead of P8=1]***

*[IF <LEDBLBDB> =1 OR P7 =1 OR P13>0 OR P14<>7]* To the best of your knowledge, has your store run any special discounts or promotions on LED light bulbs or fixtures in retail stores since 2010?

| | | |
|---|---|---|
| 1 | No | *[SKIP TO P19]* |
| 2 | Yes – Just LED bulbs | |
| 3 | Yes – Just LED fixtures | |
| 4 | Yes – LED bulbs AND LED fixtures | |
| -97 | Don't know | |
| -4 | Interviewing error | |
| -5 | Programming change | |
| -6 | Program skip | |

P16 Who sponsored these promotions? Would you say that it was your company, a lighting manufacturer, a local electric utility, or someone else? *[ALLOW MULTIPLE RESPONSES]*

For P16_1 through P16_6

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -4 | Interviewing error |
| -5 | Programming change |
| -6 | Program skip |

| | |
|---|---|
| **P16_1** | My company (retailer) |
| **P16_2** | Lighting manufacturer |
| **P16_3** | Utility |
| **P16_4** | Someone else *[SPECIFY]* |
| **P16_5** | Don’t know |
| **P16_6** | Refused |
| **P16_OPN** | Other program sponsor |

**P17** *[IF P15E = 2 or 4]* What types of LED light bulbs were included in these promotions? *[DO NOT READ RESPONSES. ACCEPT MULTIPLE RESPONSES. IF NECESSARY, SAY: "WE'RE ONLY INTERESTED IN THE LIGHT BULB SHAPE NOT THE BRAND OR MANUFACTURER."]*

For P17_1 through P17_7

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -4 | Interviewing error |
| -5 | Programming change |
| -6 | Program skip |

| | |
|---|---|
| **P17_1** | General Use LEDS, such as: A-lamp, Globes, typically medium base |
| **P17_2** | Spotlight LEDs, such as: floodlight/ reflector LEDs e.g., BR-40, R-30, PAR-30, MR-16 LEDs |
| **P17_3** | Nightlight LEDS, such as: C-7 and C-9 LEDs |
| **P17_4** | Holiday LEDs |
| **P17_5** | Other *[SPECIFY]* |
| **P17_6** | Don't know/Not sure/Can't remember |
| **P17_7** | Refused |
| **P17_OPN** | Other type of LED bulb included in promotions |

**P18** *[IF P15E = 3 or 4]* What types of LED light fixtures were included in these promotions? *[DO NOT READ RESPONSES. ACCEPT MULTIPLE RESPONSES. IF NECESSARY, SAY: "WE'RE ONLY INTERESTED IN THE LIGHT FIXTURE TYPE NOT THE BRAND OR MANUFACTURER."]*

For P18_1 through P18_11

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -4 | Interviewing error |
| -5 | Programming change |
| -6 | Program skip |

| | |
|---|---|
| **P18_1** | Desk lamp |
| **P18_2** | Table lamp |
| **P18_3** | Floor lamp |
| **P18_4** | Built-in under counter |
| **P18_5** | Wall sconce |
| **P18_6** | Ceiling can |
| **P18_7** | Other type of overhead fixture |
| **P18_8** | Exterior lighting |
| **P18_9** | Other *[SPECIFY]* |
| **P18_10** | Don't know |
| **P18_11** | Refused |
| **P18_OPN** | Other type of LED fixture included in promotion |

**P19** *[ONLY IF RETAILER IS IN HOME IMPROVEMENT OR HARDWARE RETAIL CHANNELS IF (CHANNEL<>"HARDWARE" & CHANNEL<>"HOME IMPROVEMENT") ELSE SKIP TO A3int]*
Does your store sell linear fluorescent lamps such as T8, T12, or T5 lamps?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO A3int]* |
| -6 | Program skip | |

**P20** Are you aware of federal laws that phased out the production of most types of T12 linear fluorescent lamps starting in July 2012?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | |
| -6 | Program skip | |

**P21** Is your company still selling T12 lamps?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO A3int]* |
| -97 | Don’t know | *[SKIP TO A3int]* |
| -6 | Program skip | |

**P22** There are two categories of T12 lamps that still can be sold after the federal phase-out including:

1) Older model T12 lamps that retailers had in their stockpiles when the new legislation went into effect and which they are allowed to sell through; or

2) Newly-manufactured T12 lamps that meet the stricter federal standards.

Is your store selling the older model T12 lamps, the newly-manufactured T12 lamps, or a mixture of both?

1 The older model T12 lamps

2 The newly-manufactured T12 lamps

3 A mixture of both

4 Other *[RECORD RESPONSE]*

-97 Don't know

-6 Program skip

**P22A** Are most of your T12 customers making low-volume purchases such as four bulbs or fewer per sale?

1 Yes

2 No

-97 Don't know

-6 Program skip

**P23** Can you make any generalizations about the types of customers who are purchasing most of these T12 lamps? For example, are they mostly residential customers? Mostly small business customers? Mostly contractors?

1 No, I can't make any such generalizations

2 Mostly residential customers

3 Mostly small business customers

4 Mostly contractors

5 Other categories [RECORD RESPONSE]

-97 Don't know

-6 Program skip

**P23_OPN** Other generalization about customers who are purchasing T12 lamps.

**P24** Of the linear fluorescent lamps that your company currently sells, about what percent of these are T12 lamps?

*[RECORD PERCENTAGE]*_________

-97 Don't know

-6 Program skip

**P25** What do you estimate this percentage was about four years ago, before the new legislation?

*[RECORD PERCENTAGE]*_________

-97 Don't know

-6 Program skip

## SALES TRENDS AND PROGRAM ATTRIBUTION QUESTIONS

**A3int** Now I'm going to ask you some questions on the possible effects of the Massachusetts ENERGY STAR program on your sales of lighting products.

**A3** *[IF <STCFLDB> ≠ 0 ASK A3 ELSE SKIP TO A8]* During 2013 the Massachusetts ENERGY STAR program provided average buydown discounts of about $1.35 for every standard ENERGY STAR CFL bulb sold through the program. If these discounts had not been available, do you think your store(s) would have sold any of these types of standard ENERGY STAR CFLs in the 2013 period?

| | | |
|---|---|---|
| 1 | Yes | *[SKIP TO A4]* |
| 2 | No | |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO A4]* |
| -6 | Program skip | |

A3A Why wouldn't you have sold any standard ENERGY STAR CFL bulbs without the program discounts? *[DO NOT READ RESPONSES. ALLOW MULTIPLE RESPONSES]*

For A3A_1 through A3A_5

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -6 | Program skip |

**A3A_1** We are a $1/99 cent store and we can't meet $1/99 cent price limit w/o discounts *[SKIP TO A8]*

**A3A_2** Lighting is product we only sell if there are substantial discounts available *[SKIP TO A8]*

**A3A_3** Other reasons *[SPECIFY]* *[SKIP TO A8]*

**A3A_4** Don't know/Not sure/Can't remember *[SKIP TO A8]*

**A3A_5** Refused *[SKIP TO A8]*

**A3A_opn** Other reasons store would not have sold standard CFLs without program discounts

**A4** If these average buydown discounts offered by the program of $1.35 per standard ENERGY STAR CFL bulb were not available, do you think your sales of these CFL bulbs would be about the same, lower, or higher?

1 Same *[SKIP TO A7A]*

2 Lower

3 Higher *[SKIP TO A7A]*

-97 Don't know/Not sure/Can't remember *[SKIP TO A8]*

-6 Program skip

**A5** By what percentage do you estimate your store's sales of these standard CFLs would be lower during this 2013 period if the Massachusetts ENERGY STAR program discounts averaging $1.35 per standard CFL bulb were not available?

*[RECORD PERCENTAGE]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**A6** *[IF A5 = -97 OR -98 THEN SKIP TO A8]* I want to make sure I understand you correctly when you say your store's sales of standard CFLs would be *[%FROM QUESTION A5]* lower without the program buydown discounts. So you're saying that if you sold 100 CFLs in a given week with the program discounts, you would have only sold *[100 - (%FROM QUESTION A5 * 100)]* that week without the program discounts.

1 Yes

2 No *[CLARIFY RESPONSE TO A5]*

-6 Program skip

**A7A** *[IF A4 ≠ 1 AND A4 ≠ 3 THEN SKIP TO A8]* Please explain why you think your sales of standard CFLs would *be [IF A4=1 THEN SAY "THE SAME", IF A4=3 THEN SAY "HIGHER"]* in the absence of the Massachusetts ENERGY STAR program.

1 *[RECORD RESPONSE]*
-6 Program skip

**A7A_OPN** Response for why sales of standard CFLs would be *[THE SAME/HIGHER]*.

**A7B** *[IF A4 ≠3 SKIP TO A8]* By what percentage do you estimate your store's sales of these standard CFLs would be higher during this 2013 period if the Massachusetts ENERGY STAR program discounts averaging $1.35 per standard CFL bulb were not available?

*[RECORD PERCENTAGE]*_________

-6 Program skip

**A7C** *[IF A7B = -97 OR -98 THEN SKIP TO A8]* I want to make sure I understand you correctly when you say your store's sales of standard CFLs would be *[%FROM QUESTION A7B]* higher without the program buydown discounts. So you're saying that if you sold 100 standard CFLs in a given week with the program discounts, you would have sold *[100 + (% FROM QUESTION A7B * 100)]* that week without the program discounts.

1 Yes

2 No *[CLARIFY RESPONSE TO A7B]*

-6 Program skip

**A8** *[IF <SPCFLDB> =1 ASK A8, ELSE SKIP TO A20]* Now I'm going to ask you about the effect of the Massachusetts ENERGY STAR program buydown discounts on your sales of specialty CFLs. Once again, specialty CFLs are those that do not have the spiral shape or those that have special features. Examples of specialty CFLs are a-lamp, globe, and reflector shaped bulbs, and those with dimmable or 3-way capabilities. Throughout the whole program there was an average buydown discount of $2.33 per specialty CFL bulb. If these buydown discounts had not been available, do you think your store(s) would have sold these types of specialty CFLs in the 2013 period?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO A20]* |
| -97 | Don't know/Not sure/Can't remember | |
| -6 | Program skip | |

**A9** If these average buydown discounts offered by the program of about $2.33 per specialty CFL bulb were not available, do you think your sales of these types of specialty CFL bulbs would be about the same, lower, or higher?

| | | |
|---|---|---|
| 1 | Same | *[SKIP TO A12A]* |
| 2 | Lower | |
| 3 | Higher | *[SKIP TO A12A]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO A20]* |
| -6 | Program skip | |

**A10** By what percentage do you estimate your store's sales of these specialty CFLs would be lower during this 2013 period if the average Massachusetts ENERGY STAR program discounts of $2.33 per specialty CFL bulb were not available?

*[RECORD PERCENTAGE]*_________

| | |
|---|---|
| -97 | Don't know/Not sure/Can't remember |
| -6 | Program skip |

**A11** *[IF RESPONDENT WAS ALREADY ASKED A6 OR A7C; OR A10 = -97 OR -98 THEN SKIP TO A20]* I want to make sure I understand you correctly when you say your store's sales of specialty CFLs would be *[% FROM QUESTION A10]* lower without the program buydown discounts. So you're saying that if you sold 100 specialty CFLs in a given week with the program discounts, you would have only sold *[100 - (%FROM QUESTION A10 * 100)]* that week without the program discounts. *[IF RESPONSE IS ≠ YES THEN CLARIFY RESPONSE TO A10]*

1 Yes

2 No *[CLARIFY RESPONSE TO A10]*

-6 Program skip

**A12A** *[IF A9 ≠ 1 AND A9 ≠ 3 THEN SKIP TO A20]* Please explain why you think your sales of specialty CFLs would be *[IF A9=1 THEN SAY "THE SAME", IF A9=3 THEN SAY "HIGHER"]* in the absence of the Massachusetts ENERGY STAR program

1 *[RECORD RESPONSE]*

-97 Don't know/Not sure/Can't remember

-6 Program skip

**A12A_OPN** Response for why sales of specialty CFLs would be *[THE SAME/HIGHER]*.

**A12B** *[IF A9 ≠ 3 SKIP TO A20]* By what percentage do you estimate your store's sales of these specialty CFLs would be higher during this 2013 period if the Massachusetts ENERGY STAR program discounts averaging about $2.33 per specialty CFL bulb were not available?

*[RECORD PERCENTAGE]*_________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**A12C** *[IF RESPONDENT WAS ALREADY ASKED A6, A7C; OR A11; OR IF A12B = -97 OR -98 THEN SKIP TO A20]* I want to make sure I understand you correctly when you say your store's sales of specialty CFLs would be *[% FROM QUESTION A12B]* higher without the program buydown discounts. So you're saying that if you sold 100 specialty CFLs in a given week with the program discounts, you would have sold *[100 + (% FROM QUESTION A12B * 100)]* that week without the program discounts. *[IF RESPONSE IS ≠ YES THEN CLARIFY RESPONSE TO A12B]*

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[CLARIFY RESPONSE TO A12B]* |
| -6 | Program skip | |

**A20** *[IF <LEDBLBDB> =1 ASK A20 ELSE SKIP TO A27]* Now I'm going to ask you about the effect of the Massachusetts ENERGY STAR program buydown discounts on your sales of LED bulbs. Throughout the whole program there was an average buydown discount of about $12 per LED bulb. If these buydown discounts had not been available, do you think your store(s) would have sold LED bulbs in the 2013 period?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | [SKIP TO A27] |
| -97 | Don't know/Not sure/Can't remember | |
| -6 | Program skip | |

**A21** If these average buydown discounts offered by the program of $12 per LED bulb were not available, do you think your sales of these LED bulbs would be about the same, lower, or higher?

| | | |
|---|---|---|
| 1 | Same | *[SKIP TO A24]* |
| 2 | Lower | |
| 3 | Higher | *[SKIP TO A24]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO A27]* |
| -6 | Program skip | |

**A22** By what percentage do you estimate your store's sales of these LED bulbs would be lower during this 2013 period if the average Massachusetts ENERGY STAR program discounts of $12 per LED bulb were not available?

*[RECORD PERCENTAGE]*_________

| | |
|---|---|
| -97 | Don't know/Not sure/Can't remember |
| -6 | Program skip |

**A23** *[IF RESPONDENT WAS ALREADY ASKED A6, A7C; A11, A12C, OR IF A22 = -97 OR -98 THEN SKIP TO A27]* I want to make sure I understand you correctly when you say your store's sales of LED bulbs would be *[% FROM QUESTION A22]* lower without the program buydown discounts. So you're saying that if you sold 100 LED bulbs in a given week with the program discounts, you would have only sold *[100 - (%FROM QUESTION A22 * 100)]* that week without the program discounts. *[IF RESPONSE IS ≠ YES THEN CLARIFY RESPONSE TO A22]*

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[CLARIFY RESPONSE TO A22]* |
| -6 | Program skip | |

**A24** *[IF A21≠ 1 AND A21 ≠ 3 THEN SKIP TO A27]* Please explain why you think your sales of LED bulbs would be *[IF A21=1 THEN SAY "THE SAME", IF A21=3 THEN SAY "HIGHER"]* in the absence of the Massachusetts ENERGY STAR program?

| | |
|---|---|
| 1 | *[RECORD RESPONSE]* |
| -6 | Program skip |

**A24_OPN** Response for why sales of LED bulbs would be *[THE SAME/HIGHER]*.

**A25** *[IF A21 ≠ 3 SKIP TO A27]* By what percentage do you estimate your store's sales of these LED bulbs would be higher during this 2013 period if the Massachusetts ENERGY STAR program discounts averaging $12 per LED bulbs were not available?

*[RECORD PERCENTAGE]*_________

-6 Program skip

**A26** *[IF RESPONDENT WAS ALREADY ASKED A6, A7C; A11, A12C; A23 OR IF A25 = -97 OR -98 THEN SKIP TO A27]* I want to make sure I understand you correctly when you say your store's sales of LED bulbs would be *[% FROM QUESTION A25]* higher without the program buydown discounts. So you're saying that if you sold 100 LED bulbs in a given week with the program discounts, you would have sold *[100 + (% FROM QUESTION A25 * 100)]* that week without the program discounts

1 Yes

2 No *[CLARIFY RESPONSE TO A25]*

-6 Program skip

**A27** Besides the discounts, do you think the Massachusetts ENERGY STAR program does anything else to help you sell energy efficient lighting products?

1 Yes

2 No *[SKIP TO E1]*

-97 Don't know/Not sure/Can't remember *[SKIP TO E1]*

**A28** Besides the discount, what else does the Massachusetts ENERGY STAR program do to help sell energy-efficient lighting products? *[ACCEPT MULTIPLE RESPONSES. DO NOT READ]*

For A28_1 through A28_7

0 Not mentioned

1 Mentioned

-6 Program skip

**A28_1** Provide in-store signage

**A28_2** Provide co-op advertising support

**A28_3** Provide other marketing support

**A28_4** Provide customer education

**A28_5** Other *[RECORD RESPONSE]*

**A28_6** Don't know

**A28_7** Refused

**A28_OPN** Other way the Massachusetts ENERGY STAR program helps sell energy-efficient lighting products

## EISA IMPACTS

**E1** In December 2007 Congress passed an energy bill called the Energy Independence and Security Act. One component of the bill calls for a gradual phase-out of inefficient lamps over time starting in 2012. Were you aware of this phase out?

*[IF NECESSARY: The phase-out began for 100 Watt general service lamps on January 1, 2012, for 75-Watt lamps the phase out starts in 2013, and for 60 and 40 Watt lamps in 2014.]*

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO SP1]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO SP1]* |

**E2** Has this legislation had any impact on your stocking practices?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO E4]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO E4]* |
| -6 | Program skip | |

**E3** Has stocking for [the following bulbs] increased, decreased, or stayed the same since 2012? *[RUN THROUGH THE WHOLE E3_1=E3_6 BATTERY BEFORE GOING TO E4]*

For E3_1 through E3_6

1 Increased

2 Decreased

3 Stayed the same

4 Not applicable/Don’t sell that bulb type

-97 Don’t know/Not sure/ Can’t remember

-98 Refused

-6 Program skip

**E3_1** Incandescents

**E3_2** Standard Spiral CFLs

**E3_3** Covered CFLs that look like incandescents such as A-line CFLs

**E3_4** Other specialty CFL types such as globes, reflectors, and dimmable CFLs

**E3_5** LEDs

**E3_6** Halogens

**E4** Have you observed any changes in your customers' purchasing behavior in response to the new regulations?

1 Yes

2 No *[SKIP TO E7]*

-97 Don't know/Not sure/Can't remember *[SKIP TO E7]*

-6 Program skip

**E5** What changes have you observed?

1 [RECORD RESPONSE]

-6 Program skip

**E5_OPN** Response for what changes have been observed in customers' purchasing behavior in response to new regulations.

E7 Have sales for [these bulbs] increased, decreased, or stayed the same since 2012? *[RUN THROUGH THE WHOLE E7_1=E7_6 BATTERY BEFORE GOING TOSP1]*

For E7_1 through E7_6

1 Increased

2 Decreased

3 Stayed the same

4 Not applicable/Don't sell that bulb type

-97 Don't know/Not sure/ Can't remember

-98 Refused

-6 Program skip

**E7_1** Incandescents

**E7_2** Standard CFLs

**E7_3** Covered CFLs that look like incandescents such as A-line CFLs

**E7_4** Other specialty CFL types such as globes, reflectors, and dimmable CFLs

**E7_5** LEDs

**E7_6** Halogens

## PROMOTING LED BULBS

**SP1** *[IF <LEDBLBDB> = 0 AND P7 ≠ 1 ELSE SKIP TO SP2]* According to our records and your previous responses your store currently does not sell any LED bulbs? Why doesn't your store offer this product? *[DO NOT READ; ALLOW MULTIPLE RESPONSES]*

For SP1_1 through SP1_11

0 Not mentioned

1 Mentioned

-6 Program skip

**SP1_1** They are too expensive for our customers

**SP1_2** They don't fit well with the rest of our product line

**SP1_3** They don't sell well

**SP1_4** We've had quality/performance problems with them in the past

**SP1_5** Our customers are not interested in them

**SP1_6** We're not familiar/comfortable enough with these products

**SP1_7** There's limited availability of them

**SP1_8** Your info is incorrect, I do currently sell LED bulbs *[SKIP TO SP2]*

**SP1_9** Other reasons *[RECORD]*

**SP1_10** Don't know/Not sure/Can't remember

**SP1_11** Refused

**SP1_OPN** Other reason for why store doesn't sell LED bulbs

**SP2** ***[Survey Change 6/18/14 4:00PM [IF <LEDBLBDB> = 0 AND P7 ≠ 1 AND SP1<>8 SKIP TO S3]]*** According to our records and your previous responses your store currently sells LED bulbs. Within the past year would you characterize sales of these products as being excellent, good, fair, or poor?

1 Excellent

2 Good

3 Fair

4 Poor

5 Your info is incorrect, I do not currently sell LED bulbs *[GO BACK TO SP1]*

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP2A** Did you sell LEDs before 2013?

1 Yes

2 No

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP2C** Of the LED bulbs that you currently sell, which one type or model sells the best? *[DO NOT READ RESPONSES. ONLY ALLOW ONE RESPONSE]*

1 General Use LEDS (A-lamp, Globes, typically medium base LEDs)

2 Spotlight LEDs (including floodlight/ reflector LEDs e.g., BR-40, R-30, PAR-30, MR-16 LEDs)

3 Decorative LEDs

4 Nightlight LEDS (e.g., C-7 and C-9 LEDs)]

5 Holiday LEDs

6 Other [SPECIFY]

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP2C_OPN** Other type or model of LED bulb that sells the best

**SP2D** Of the LED bulbs that you currently sell, which one type or model sells the worst? *[DO NO READ. ONLY ALLOW ONE RESPONSE]*

1 General Use LEDS (A-lamp, Globes, typically medium base LEDs)

2 Spotlight LEDs (including floodlight/ reflector LEDs e.g., BR-40, R-30, PAR-30, MR-16 LEDs)

3 Decorative LEDs

4 Nightlight LEDS (e.g., C-7 and C-9 LEDs)

5 Holiday LEDs

6 Other *[SPECIFY]*

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP2D_OPN** Other type of model of LED bulb that sells the worst.

**SP2E** What factors or barriers prevent more of these LED bulbs from being sold? *[DO NOT READ LIST. ALLOW MULTIPLE RESPONSES]*

For SP2E_1 through SP2E_11

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -6 | Program skip |

**SP2E_1** They are too expensive for our customers

**SP2E_2** They don’t fit well with the rest of our product line

**SP2E_3** They don’t sell well

**SP2E_4** We’ve had quality/performance problems with them in the past

**SP2E_5** Our customers are not interested in them

**SP2E_6** We’re not familiar/comfortable enough with these products

**SP2E_7** There’s limited availability of them

**SP2E_8** Program discounts/rebates are not always available

**SP2E_9** Other reasons *[RECORD RESPONSE]*

**SP2E_10** Don't know/Not sure/Can't remember

**SP2E_11** Refused

**SP2E_OPN** Other factors or barriers preventing more LED bulbs from being sold.

**SP2F** *[IF P13 > 0]* You indicated that you currently sell LED fixtures. What factors or barriers prevent these LED fixtures from being sold? *[DO NOT READ LIST. ALLOW MULTIPLE RESPONSES]*

For SP2F_1 through SP2F_11

0 Not mentioned

1 Mentioned

-6 Program skip

**SP2F_1** They are too expensive for our customers

**SP2F_2** They don't fit well with the rest of our product line

**SP2F_3** They don't sell well

**SP2F_4** We've had quality/performance problems with them in the past

**SP2F_5** Our customers are not interested in them

**SP2F_6** We're not familiar/comfortable enough with these products

**SP2F_7** There's limited availability of them

**SP2F_8** Program discounts/rebates are not always available

**SP2F_9** Other reasons [RECORD RESPONSE]

**SP2F_10** Don't know/Not sure/Can't remember

**SP2F_11** Refused

**SP2F_OPN** Other factors of barriers preventing LED fixtures from being sold

**SP2G** Do you think retail prices for LED bulbs over the next few years will go up, go down, or stay about the same?

1 Prices will go up

2 Prices will go down

3 Prices will stay about the same

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP3** *[IF SP2G = 1, 2 OR 3 ELSE SKIP TO SP3A]* Why do you say this?

1 *[RECORD RESPONSE]*
-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP3_OPN** Response for why retail prices for LED bulbs will go up, go down or stay the same

**SP3A** Do you think retail prices for LED fixtures over the next few years will go up, go down, or stay about the same?

1 Prices will go up

2 Prices will go down

3 Prices will stay about the same

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP3B** *[IF SP3A = 1, 2 OR 3 ELSE SKIP TO SP4]* Why do you say this?

1 *[RECORD RESPONSE]*

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP3B_OPN** Response for why retail prices for LED fixtures will go up, go down or stay the same

**SP4** The Massachusetts ENERGY STAR lighting program has tried to promote LED bulbs over the past year. Using a scale of zero to ten where zero means "not very effective at all" and ten means "very effective" and how would you rate the effectiveness of these efforts?

*[RECORD EFFECTIVENESS RATING]*_____

-97 Don't know/Not sure/Can't remember *[SKIP TO SP6]*

-6 Program skip

**SP5** Why do you say this?

1 *[RECORD RESPONSE]*

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP5_OPN** Explanation for effectiveness rating of effectiveness of promotion efforts

**SP6** The Massachusetts ENERGY STAR lighting program currently offers average buydown discounts for LED bulbs of about $12 per bulb. Do you think these incentive levels are adequate to move consumer demand for these products?

| | |
|---|---|
| 1 | Yes, for all LED bulbs |
| 2 | Yes for some LED bulbs, not for others |
| 3 | No, not for any LED bulbs |
| -97 | Don't know/Not sure/Can't remember |
| -6 | Program skip |

**SP7** *[IF SP6 = 2 ELSE SKIP TO SP8]* For which types of LED bulbs do you think the buydown discounts need to be increased? *[DO NOT READ]*

For SP7_1 through SP7_5

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -6 | Program skip |

**SP7_1** A-line/A-lamp/A19 LED bulbs

**SP7_2** Reflector/Floods/Par 30/Par 38 LED bulbs

**SP7_3** Other *[RECORD RESPONSE]*

**SP7_4** Don't know/Not sure/Can't remember

**SP7_5** Refused

**SP7_OPN** Other type of LED bulb for which buydown discounts need to be increased

**SP8** *[IF SP6 = 3 ELSE SKIP TO SP9]* What incentive levels do you think are needed to move consumer demand for these products? *[IF NEEDED, REMIND THAT THE CURRENT AVERAGE BUYDOWN AMOUNT IS $12.]*

*[RECORD RESPONSE]*________________

-97 Don't know/Not sure/Can't remember

-6 Program skip

**SP9** If the Massachusetts ENERGY STAR Lighting Program Administrators wanted to increase retail sales of LED bulbs over the next few years, do you have any suggestions as to best ways for them to do this? *[DO NOT READ; ALLOW MULTIPLE RESPONSES]*

For SP9_1 through SP9_11

0 Not mentioned

1 Mentioned

-6 Program skip

**SP9_1** No suggestions

**SP9_2** Offer larger rebates/incentives on LED bulbs

**SP9_3** Provide customer education about LED bulbs

**SP9_4** Provide retailer education about LED bulbs

**SP9_5** Improve the quality/performance of these LED bulbs

**SP9_6** Make these LED bulbs more available

**SP9_7** Other [RECORD]

**SP9_8** Don't know/Not sure/Can't remember

**SP9_9** Refused

**SP9_OPN** Other suggestion for the best way for the Massachusetts ENERGY STAR lighting program to increase retail sales of LED bulbs

**SP10** Are the regular retail prices for your LED bulbs, not counting any discounts from the Massachusetts ENERGY STAR lighting program or any other sources, higher, lower, or about the same as they were two years ago?

| | |
|---|---|
| 1 | Higher |
| 2 | Lower |
| 3 | About the same |
| 4 | We were not selling LED bulbs two years ago |
| -97 | Don't know/Not sure/Can't remember |
| -6 | Program skip |

**SP11** The Massachusetts ENERGY STAR lighting program has been offering rebates on LED products since 2011. Have these programs had any effects on the variety of LED products that you sell in Massachusetts?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO SP14]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO SP14]* |
| -6 | Program skip | |

**SP12** What effects has the program had on the types of LED products you sell? *[DO NOT READ; ALLOW MULTIPLE RESPONSES]*

For SP12_1 through SP12_5

0 Not mentioned

1 Mentioned

-6 Program skip

**SP12_1** We sell a greater variety of LED products since joining the program

**SP12_2** We sell a lesser variety of LED products since joining the program

**SP12_3** Other [RECORD]

**SP12_4** Don't know/Not sure/Can't remember

**SP12_5** Refused

**SP12_OPN** Other effect the program has on the types of LED bulbs sold.

**SP14** Have the Massachusetts lighting rebate and discount programs had any effects on how you promote the LED products that you sell in Massachusetts?

1 Yes

2 No [SKIP TO S3]

-97 Don't know/Not sure/Can't remember [SKIP TO S3]

-6 Program skip

**SP15** How have these lighting rebate and discount programs affected the way you promote these LED products?

1 *[RECORD RESPONSE]*

-6 Program skip

**SP15_OPN** Response for how the lighting rebate and discount affected the way LED products were promoted.

| PROGRAM SATISFACTION |
|---|

**S3** Using a scale of one to five where five equals “very satisfied” and one equals “very dissatisfied,”, how satisfied have you been with the availability of program-discounted bulbs? *[REMIND RESPONDENT OF SATISFACTION SCALE, IF NECESSARY]*

| | | |
|---|---|---|
| 1 | Very dissatisfied | |
| 2 | | |
| 3 | | |
| 4 | | *[SKIP TO S12]* |
| 5 | Very satisfied | *[SKIP TO S12]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO S12]* |

**S5** Are there certain types of program-discounted bulbs that you have greater concern about availability than others?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO S12]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO S12]* |
| -6 | Program skip | |

**S6** Which types? *[DO NOT READ RESPONSES. INDICATE ALL THAT APPLY. NOTE SPECIALTY CFLS INCLUDE CFLS THAT DO NOT HAVE THE SPIRAL SHAPE, LIKE A-SHAPE OR GLOBE-SHAPE LAMPS, OR CFLS WITH SPECIAL FEATURES SUCH AS DIMMABLE, 3-WAY, OR REFLECTOR CFLS]*

For S6_1 through S6_6

| | |
|---|---|
| 0 | Not mentioned |
| 1 | Mentioned |
| -97 | Don't know/Not sure/Can't remember |
| -6 | Program skip |

**S6_1** Standard CFLs

**S6_2** Specialty CFLs

**S6_3** LED bulbs

**S6_4** Other [RECORD RESPONSE]

**S6_5** Don't know/Not sure/Can't remember

**S6_6** Refused

**S6_OPN** Other type of program-discounted bulb with greater concern about availability.

**S7** *[IF S6=3 ELSE SKIP TO S12]* You said you had concerns about the availability of program-discounted LED bulbs, What types of LED bulbs in particular do you have concerns about? *[DO NOT READ RESPONSES. INDICATE ALL THAT APPLY]*

For S7_1 through S7_6

0 Not mentioned

1 Mentioned

-6 Program skip

**S7_1** No particular type, just LEDs in general

**S7_2** A-line/A-lamp/A19 LED bulbs

**S7_3** Reflector/Flood/Par 30/Par 38 LED bulbs

**S7_4** Other [RECORD RESPONSE]

**S7_5** Don't know/Not sure/Can't remember

**S7_6** Refused

**S12** Using a scale of one to five where five equals "very satisfied" and one equals "not satisfied at all," how satisfied have you been with the Massachusetts ENERGY STAR lighting program as a whole? [IF NECESSARY, REMIND RESPONDENT OF SATISFACTION SCALE]

| | | |
|---|---|---|
| 1 | Not satisfied at all | |
| 2 | | |
| 3 | | |
| 4 | | *[SKIP TO S13A]* |
| 5 | Very satisfied | *[SKIP TO S13A]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO S13A]* |

| | | |
|---|---|---|
| **S13** | Why are you less than satisfied with the program? | |
| | 1 *[RECORD RESPONSE]* | |
| | -6 Program skip | |

**S13_OPN** Reason for being less than satisfied with the Massachusetts ENERGY STAR program as a whole.

**S13A** The Massachusetts ENERGY STAR lighting program is looking for ways that lighting retailers could become more involved in marketing this program. Do you have any ideas on how this might be done?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO S14]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO S14]* |

**S13B** What ideas do you have?

| | |
|---|---|
| 1 | *[RECORD RESPONSE]* |
| -6 | Program skip |

**S13B_OPN** Ideas for how lighting retailers could become more involved in the marketing of the Massachusetts ENERGY STAR lighting program.

**S14** Do you have any other suggestions on how this Massachusetts ENERGY STAR lighting program could be improved?

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | *[SKIP TO S16]* |
| -97 | Don't know/Not sure/Can't remember | *[SKIP TO S16]* |

**S15** What suggestion do you have?

1 *[RECORD RESPONSE]*
-6 Program skip

**S15_OPN** Suggestions on how the Massachusetts ENERGY STAR lighting program could be improved.

**S16** Will you participate in this program in the future?

1 Yes *[THANK AND TERMINATE]*

2 No

-97 Don't know/Not sure/Can't remember *[THANK AND TERMINATE]*

**S17** Why not?

1 *[RECORD RESPONSE]*
-6 Program skip

**S17_OPN** Reason for not participating in this program in the future.

**END** Do you have any comments?

1 Yes
2 No

**END_opn** Comments.

**intdate** Date of interview