Non-Participant Suggested Items for Sale at Store

Because non-participants visited the Savings Store without making a purchase, they were asked if there were any other items Duke Energy might offer for sale to better align the Store's inventory with their needs. Respondents provided a wide-ranging list of suggestions, including a greater variety of LEDs and other kinds of CFL bulbs for currently unaddressed specialty applications such as bright/higher wattage equivalents, landscaping, and ambiance lighting. They also suggested non-lighting energy efficiency devices including "smart home" devices, weatherization items, and other devices to control lighting, such as timers and motion detectors. Below is a list of their suggestions which are not currently offered for sale through the Savings Store.

- Greater variety of LEDs
- Daylight and other color spectrum bulbs
- Brighter/higher wattage equivalent bulbs
- Outdoor and landscape lighting
- Mini bulbs smaller than candelabras
- Flickering candelabra bulbs
- Night lights
- Under cabinet lights
- Clear globes
- "Smart home" devices and computer-controlled devices
- Motion detection lights
- Timer devices
- Home weatherization items
- Rechargeable batteries

Suggested Website Additions and Improvements

Surveyed non-participants were asked if they had any ideas for additions or improvements to the features of the Store website. While many respondents had no suggestions, others offered a sizeable list of feature upgrades and new concepts to make their online shopping easier or otherwise improve the program and encourage further purchases.

Two representative customer quotes include: "*What's a spring lamp? Incented means what? Some of the terminology provided at the Savings Store needs to be simplified or dumbed down. Most people don't know or don't care about these technicalities. In a way, they can confuse or irritate a customer who basically is just looking for a bulb. A lot of the time we just want to be told what to buy*," and "*I would have liked the option to add the cost of the purchase onto my monthly bill. That way I would not have to get my credit card out. Also, I wanted to buy 15 of a certain type of bulb but the limit caused me not complete my purchase. I did not have time to mess with moving to another part of the website to order the remaining bulbs.*"

A more fully representative list of suggestions included the following:

- Show what the shipping would be before placing the order
- Side by side comparison of bulbs

- Graphs to illustrate bulb costs and energy savings
- Better filters for sorting the bulb types
- Use less jargon so it's easier to understand
- Lower prices
- Special promotions and periodic sale pricing
- Ability to pay for bulbs on monthly bill
- A sliding scale credit on my bill based on the greater use of energy efficient lighting
- Offer a wider variety of LEDs
- Free shipping
- Free returns
- More frequent advertising
- More prominent advertising
- Radio advertising
- Establish local stores
- Provide links to other places that sell energy efficient items the Store does not sell

TecMarket Works encourages Duke Energy and EFI to consider implementing the first four bullet items since these suggestions for website improvements could noticeably enhance Store visitor experiences.

Non-Participant Bulb Buying Intentions

Alternate Methods of Buying Specialty Bulbs

Given that these Duke Energy customers elected not to buy specialty bulbs from the Savings Store, they were asked if they would have preferred a different method for obtaining bulbs. Although a majority (60.7%) said that they did not have another preference, 35.7% said that they did and 3.6% were unsure. Among those who said they preferred another method, nearly all (85.0% of 20) said they wanted to shop at retail stores, but a few had other ideas including coupons for local retailers, opening Duke Energy physical stores, and personal hand-delivery by Duke Energy employees. Three representative customer comments are listed below.

- *Have Duke team up with a local retailer so the Duke customer can see the bulbs and have the ability to take bulbs back to the store if there are any problems with them.*
- *I would have liked going to the store. I'd prefer to first look at a display of the Savings Store bulbs at a participating retailer. As a customer, it's nice to see what you are buying in real life before you make any sort of purchase.*
- *I would have preferred a store front so I could compare bulbs.*

Influence of Savings Store on Future Purchases

Future CFL Purchases

Although a majority of visiting non-participants (57.1%) indicated that their Store visits made them neither more nor less likely to purchase CFLs in the future, a sizeable 41.1% felt that their visits had made them more inclined to do so, compared to just one respondent (1.8%) who said

their visit actually made them less likely to purchase and use CFLs in the future. When asked why the Store made them less likely this customer explained: "*I can get bulbs cheaper at Walmart. I don't like the way CFLs look, and they don't all work in all of my fixtures.*" Those who said their Store experience made them more likely to purchase CFLs gave a variety of replies ranging from comments of appreciation for the Store's online shopping experience and lower prices to educated replies about the energy and light quality of CFLs. Representative examples of these comments are listed below.

- *The website makes the bulbs more accessible. Every month I'm on the Duke site to pay my bill; if I ever run out, I could order then.*
- *I shopped around and don't like crowds in box stores. If the Store gives me a reasonable rate I'll purchase the bulbs. I shop and compare but would usually rather go online to buy.*
- *The fact that I didn't know about the different varieties of CFLs available. The Savings Store made it easy to find what I needed as far as different types of bulbs.*
- *Because of the lowered prices at the Savings Store.*
- *I am more likely to use CFLs because they save energy and last longer than standard bulbs.*
- *Because they start out as dim and they get brighter; I like that feature. They also keep the house from being too bright and using too much energy.*

Future LED Purchases

Fewer non-participants who visited the Store indicated that their visits made them more likely to buy and install LEDs in the future (37.5%) compared to a majority (55.4%) who said they were neither more nor less likely. Three visitors (5.4%) indicated that their visit to the Store made them less likely to buy and use LEDs in the future, and one respondent (1.8%) said they were unsure. When asked what made them more likely to purchase LEDs in the future, respondents again mentioned both the Store and the benefits of buying LEDs. Representative selections of these comments are listed below.

- *Duke's prices offer money savings versus the price at stores.*
- *The Savings Store made it easy to find what I needed as far as different types of bulbs. I didn't know about the different varieties of LEDs available.*
- *LEDs save even more energy than CFLs and also have a longer life.*
- *LEDs have greater energy savings. I don't like how CFLs take a long time to warm up. I think LEDs will be more compatible with fixtures that are on a dimmer switch.*
- *No mercury. I like the color better. They start faster in cold. They're more easily dimmable in that they react more quickly.*
- *I've been made aware of their energy savings, and again, the Duke site seems to be offering good pricing on the LEDs right now.*
- *I just like the energy savings they offer and I like the light quality of LEDs.*

When the three visitors who said they were less likely to purchase and install LEDs after visiting the Store were asked why, they gave the following replies:

- *I don't know much about them.*
- *They are too expensive.*
- *I don't really have anything that needs those lights.*

Non-Visitor Feedback

While the sections above report responses from surveyed non-participants who visited the Store but did not make a purchase, the current section reports the results from surveys with 40 non-participants who did not visit the Savings Store.

Initial Awareness of Store among Non-Visitors

Among those non-participants who have not visited the Savings Store, nearly two thirds (62.5%) recalled first learning of the Store via a bill insert or direct mail letter, while 50.0% of Store visiting non-participants mentioned receiving mail (Figure 34). Conversely, 51.8% of Store visitors mentioned learning about the Store via Duke Energy's public website or online account system (OLS), while only 17.5% of non-visitors claimed to recall learning about the Store that way. Other ways included: non-Duke Energy websites, radio advertising, word of mouth, and fliers included with packages of free CFLs.

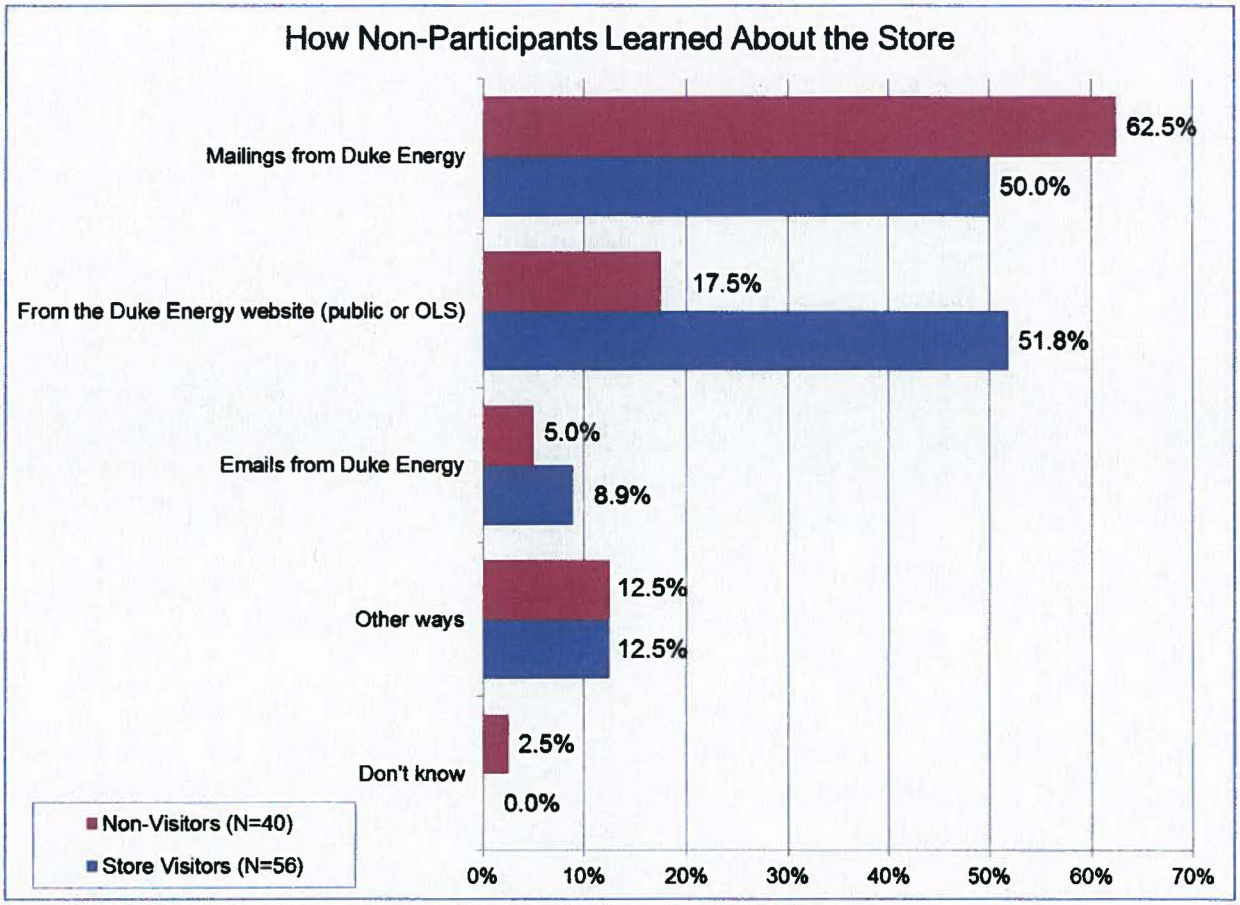

Figure 34. How Non-Participants Learned of the Savings Store

Reasons for Not Visiting the Savings Store

Non-participants who did not visit the Savings Store were asked to give one main reason for not visiting the site, and then asked if they had any additional "other reasons" for not visiting. Among non-visitors, the most frequently mentioned main reason for not visiting the Savings Store was that they did not need energy efficient light bulbs at the time (37.5%) followed by being too busy (22.5%). Together these two reasons account a majority (60.0%) of all primary reasons (Figure 35). When secondary reasons are included with the primary reasons, not needing bulbs at that time is mentioned as a reason for not visiting the Store by 42.5% of non-visitors.

Not wanting to shop online is the third most frequently mentioned reason for not visiting the Savings Store with 15.0% of non-visitors giving this as a reason. This percentage indicates that despite enhanced marketing efforts, online shopping is likely to remain a barrier for a minority of customers who prefer shopping in retail stores.

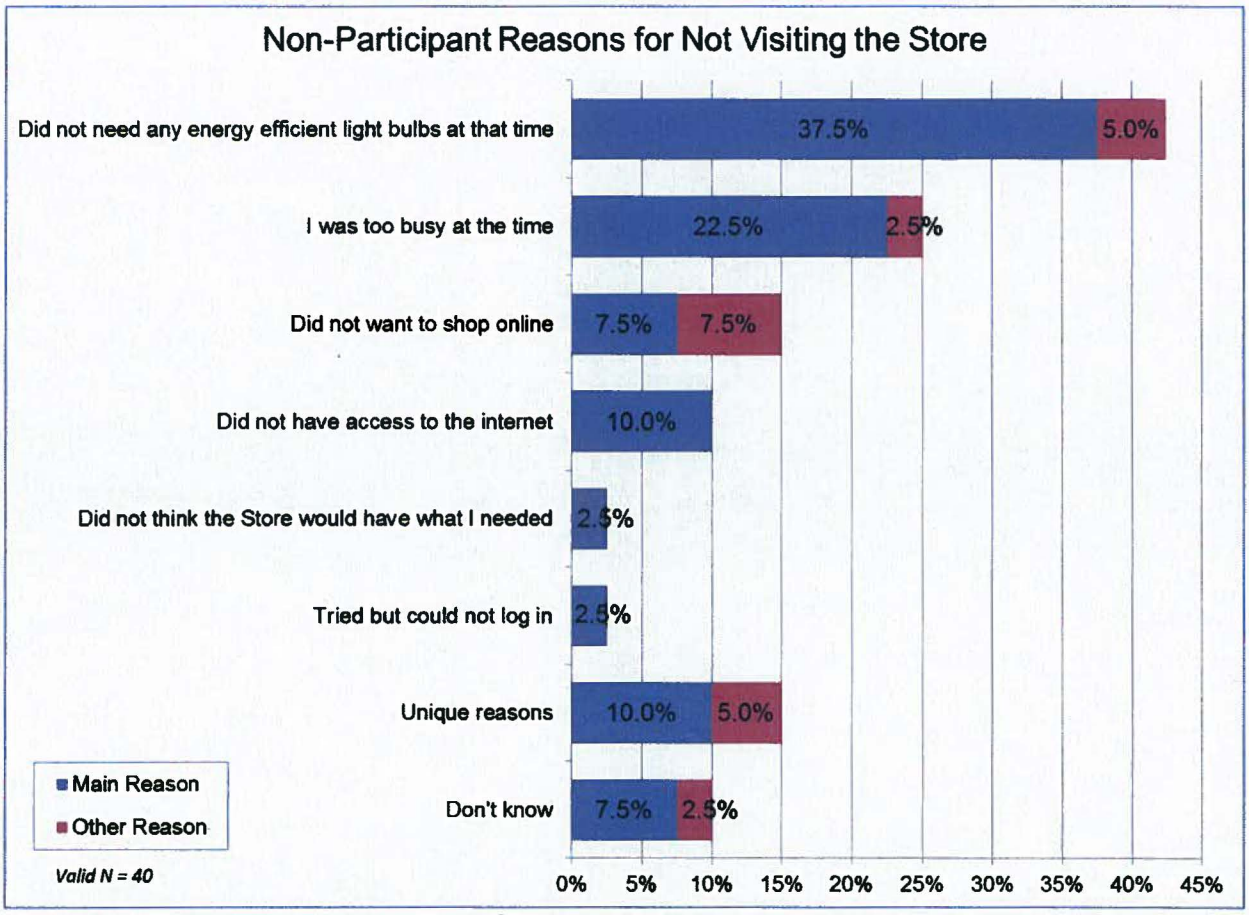

Figure 35. Reasons for Not Visiting Store

Several respondents provided unique reasons for not visiting the Store, such as those who do not use computers, cannot afford to make a purchase, and one customer who said "*I browsed the printed Savings Store promotional materials that Duke Energy sent me yet didn't realize that the Store was only available online.*" The one respondent who did not think the Store carried what they wanted explained, "*I specifically buy only daylight quality bulbs.*"

Non-Visitor Suggestions for Increasing Visits to the Savings Store

Non-visitors were asked what Duke Energy could do to encourage people like themselves to visit the Store. Respondents provided a number of ideas, such as: promoting specific specialty bulbs on the Duke Energy public website, printing a specialty bulb price sheet on the monthly bill, making more frequent comparisons to incandescent bulbs, better educating customers about the benefits of energy efficient bulbs, and offering an extended warranty. They also made suggestions for activities that Duke Energy was already doing, including accepting phone orders, advertising, and emphasizing savings of both energy and money.

Non-Visitor Suggestions for Improving Store Inventory

Customers who did not visit the Savings Store were asked if they had any suggestions for items the Savings Store might offer to make shopping there more attractive to people like them. While relatively few respondents offered suggestions, their ideas for expanding the selection of

specialty bulbs included providing brighter and/or higher wattage equivalent bulbs and more accent lighting. They also made suggestions for non-lighting items including: energy efficient space heaters and window air conditioners, weather stripping, power strips, device charging stations, furnace filters, and discounted batteries.

Non-Visitor Suggestions for Store Discounts

When asked to suggest ideas for Store discounts, non-visitors provided a number of meaningful ideas including: offering free trial bulbs, providing an extra 10% discount for first time buyers, providing discount coupons such as "*buy one, get one half off*," giving senior citizen discounts, selling gift certificates to be used by others, and starting a frequent buyer rewards program. A representative sampling of their remarks includes the following:

- *Offer free trials. Let people try a certain type of specialty CFL or LED of their choosing so they can see how the bulbs perform and compare to their current light bulbs.*
- *Besides offering the bulbs at outrageously low prices, I really don't know. I'm the type that wants to go to a store first and see what the store has. [My old utility] in Michigan has their preferred energy efficient light bulbs offered at Lowe's so people can see the bulbs there. I suggest following that example and have something in a store that represents the Duke Energy specialty energy efficient bulbs. I am most likely to purchase an item from a place where I'm already at, like the local hardware store. I'd rather go to a physical location to see the product. Duke Energy could then offer some sort of promotion or discount to entice me towards shopping at the online Savings Store, once I've seen the product in person. I don't know how good of a discount it is until I can compare with other bulbs, and to have a display of Duke Energy light bulbs next to all the other bulbs available in the store, I would better see the benefit in buying from the Savings Store.*
- *I don't look at just the price of things. It's about necessity. I want all my bulbs to match in multiple-bulb fixtures and be assured that they will fit and look appropriate according to the scale of the fixture. If Duke offered discounts for buying sets of certain numbers of bulbs, I think I would be more interested in that.*
- *The Savings Store could offer cheaper bulb prices than the 'big box' stores.*

The last comment above was echoed by numerous non-visiting non-participants indicated who said they would buy specialty bulbs from the Savings Store when the Store's prices were lower than prices at local retailers. However, TecMarket Works cautions that focusing purely on offering the lowest prices for efficient bulbs will tend to increase freeridership; customers who have already decided to install efficient bulbs and are making their purchase decisions purely on price would be freeriders and would not contribute to program savings.

Non-Visitor Attitudes toward Duke Energy

Non-visitors were asked how they felt toward Duke Energy as a result of what they know about the Savings Store. More than one third (37.5%) said they feel more positively about their utility, although a clear majority (60.0%) indicated that they feel about the same. Just one person (2.5%) held a somewhat more negative opinion of Duke Energy after exposure to the Savings Store (Figure 36). When asked to explain this, the respondent replied "Duke does anything to make

more money." Conversely, when respondents were asked why they felt more positively, they expressed sentiments of appreciation about Duke Energy's efforts to save them money, to help the environment and their communities. Some representative examples are listed below.

- *It sounds like they are trying to help their customers by offering cheaper energy efficient bulbs.*
- *My attitude towards Duke Energy is only somewhat more positive because I haven't received any coupons to try the latest specialty bulbs.*
- *My attitude towards Duke Energy is somewhat more positive because it seems like they're doing what they can to save energy and help the environment.*
- *It gives me the opportunity to shop for bulbs at a discount store without leaving home.*

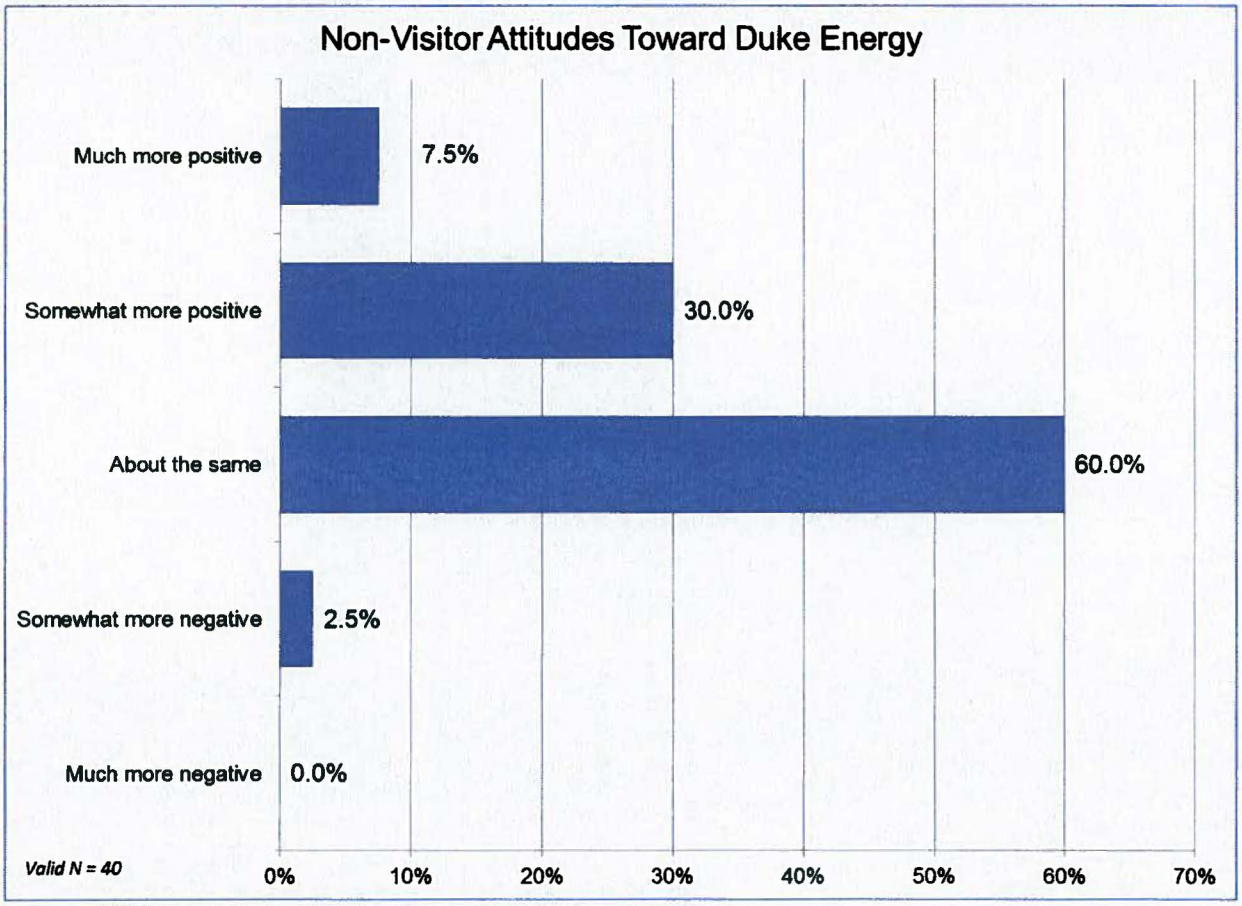

Figure 36. Non-Visitor Attitudes toward Duke Energy

Combined Non-Participant Feedback

Both subgroups of non-participants (website visitors and non-visitors) answered questions regarding overall satisfaction with Duke Energy, previous experience with energy efficient lighting, future purchases and additional energy saving actions taken.

Satisfaction with Duke Energy

Non-participant Store visitors and non-visitors are generally satisfied with Duke Energy, giving a mean satisfaction score of 7.7 on a ten-point scale where "10" is most satisfied. More than one third (35.4%) rated their satisfaction at a "9" or "10 out of 10", while the same percentage (35.4%) rated their satisfaction at 7" or lower (Figure 37). Satisfaction with Duke Energy is similar for non-participants who visited the Store (mean rating 7.8) and those who did not (mean rating 7.7); this indicates that dissatisfaction with their utility is not a barrier to visiting the Savings Store.

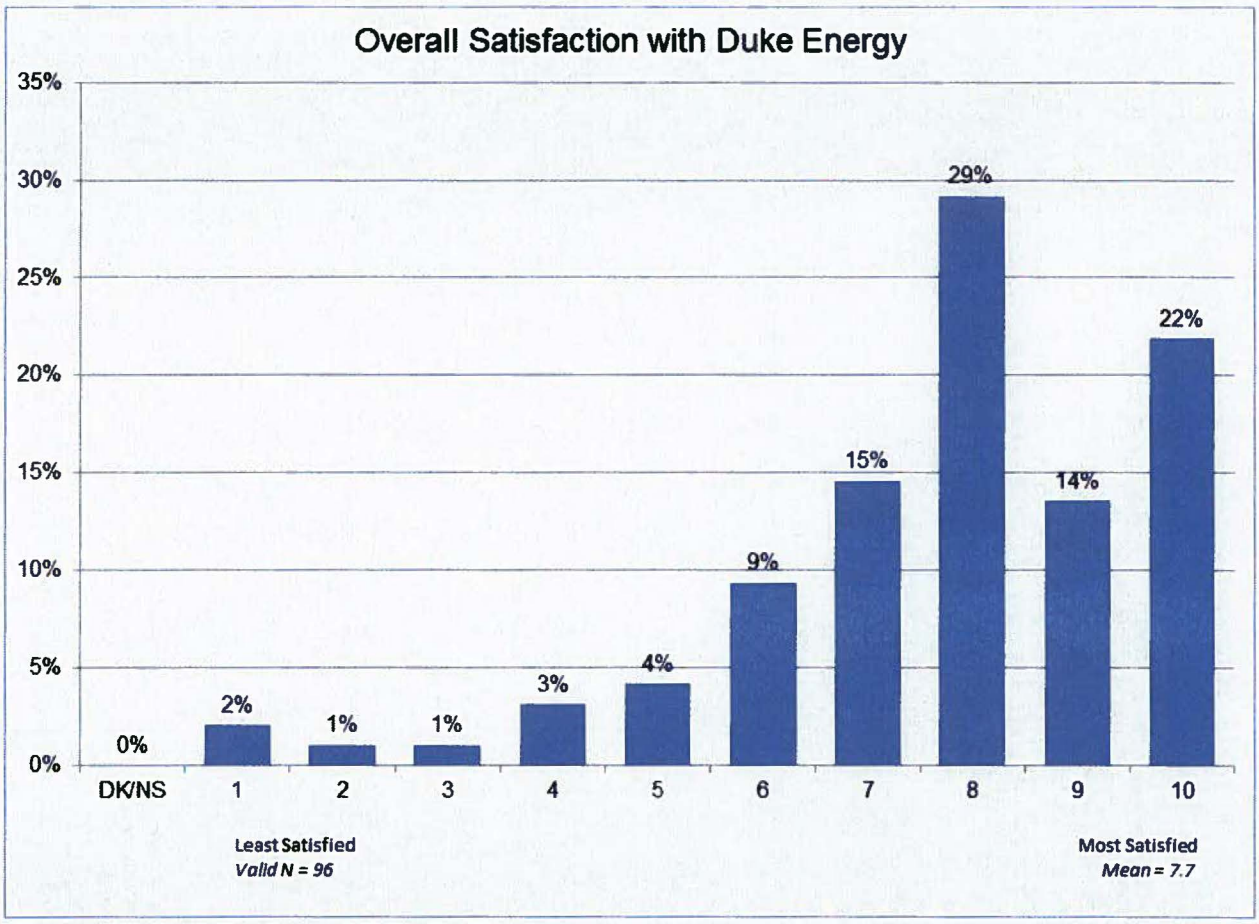

Figure 37. Satisfaction with Duke Energy

When the 35.4% of respondents who gave satisfaction scores of "7" or lower were asked to explain why they were not satisfied they made mention of: high bills and expensive rates, poor customer service, reliability concerns, issues with meter readers and line crews, closing of local payment offices, and a desire for Duke Energy to spend more on renewables and demonstrate greater environmental responsibility. The list below shows the frequency of these replies.

- High bills/expensive rates (n=13)
- Poor customer service (n=5)
- Issues with line crews (n=2)
- Spend more on renewables (n=2)

- Demonstrate greater environmental responsibility (n=2)
- Issues with meter readers (n=2)
- Closing local payment offices (n=2)
- Reliability concerns
- Increase smart grid
- Don't know (n=4)

Why Duke Energy Is Providing Specialty Bulbs

Non-participants were asked why they thought Duke Energy is providing Specialty Bulbs through the Savings Store. Customers offered a wide range of opinions, the most prevalent of which as that Duke Energy wants to save energy for economic reasons (33.3%). Saving energy for environmental reasons (28.1%) and to save customers money (26.0%) rounded out the top three most popular responses, and reducing energy use (15.6%) came in fourth. The remainder of reasons were given by fewer than 10% of surveyed non-participants. A full accounting of reasons is shown in Figure 38.

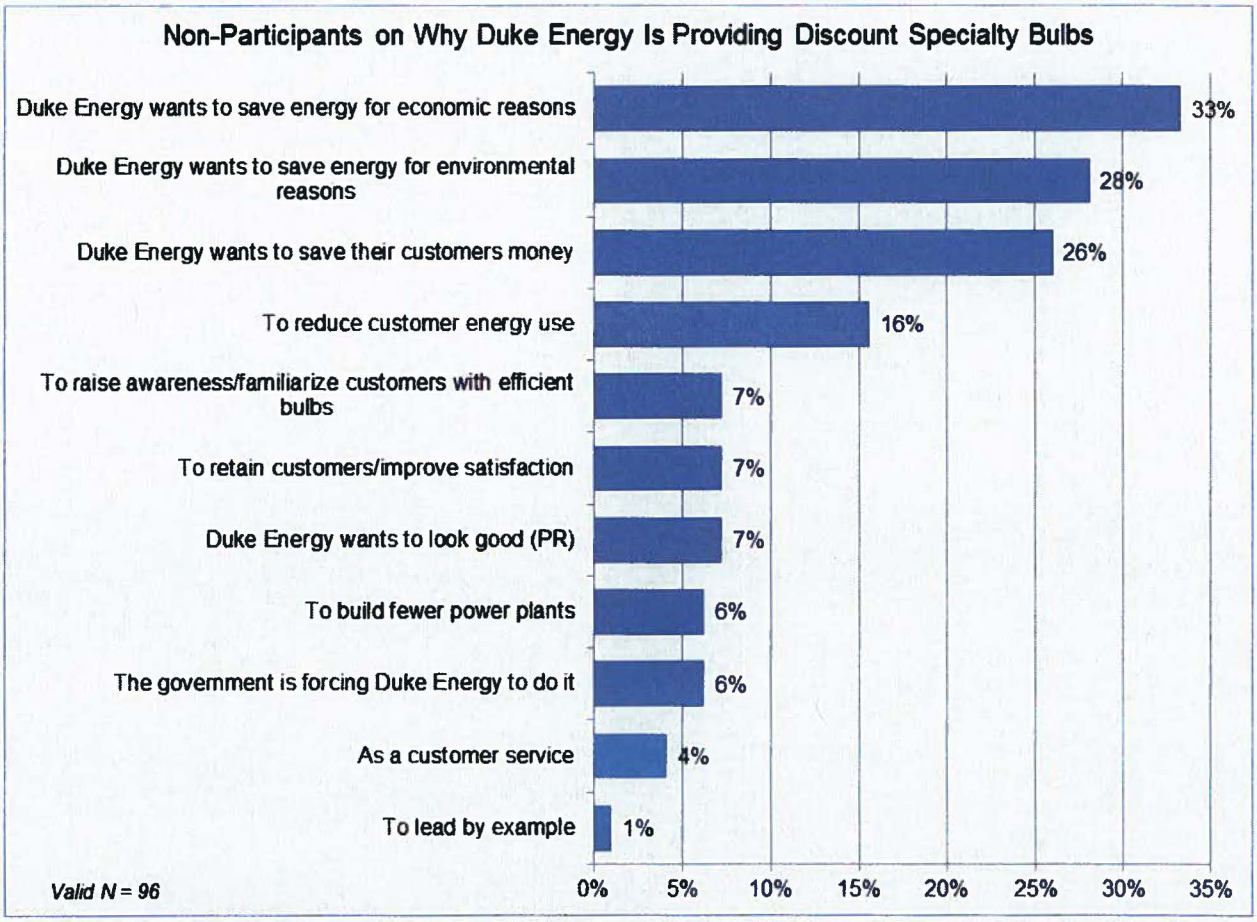

Figure 38. Why Duke Energy is Providing Specialty Bulbs

Recommending the Program

Even though they did not purchase light bulbs from the Savings Store, non-participants were asked if they told any of their friends, neighbors or relatives about the Savings Store, and if so how many people they told. Slightly more than one quarter of non-participants (29.2%) reported that they had recommended the Savings Store to others. The number of recommendations ranged from one to seven per respondent with an average of 2.0 and a median of 2.0. Half of the people who heard the recommendations were family members (52.8% of 72 recommendations) while the remainder were friends (36.1%) and co-workers (11.1%); none of the surveyed non-participants recommended the Savings Store to their neighbors. All respondents who recommended the program indicated that they used word of mouth as their method of communication, while none used email or other web-based methods.

Years of Previous Experience with Energy Efficient Bulbs

CFL use is high among non-participants with 86.5% of respondents reporting that they had CFLs installed in their homes prior to learning about the Savings Store. Among the 83 respondents who had CFLs installed, the number of installed bulbs ranged from one to 90 per household for a combined total of 1,323 CFLs. The mean number of previously installed CFLs is 15.9 among households with CFLs, while the median is 12.0 CFLs. Moreover, about half (49.4%) of non-participants report using CFLs for four or more years while only about one in six (16.9%) have been using CFLs for two years or less(Figure 39).

Just 20.8% of non-participant households had LEDs installed prior to learning about the Savings Store. These 20 LED users reported having a total of 151 LEDs installed, and the number of installed LEDs ranged from one to 70 per household. Among households with LEDs, the mean number installed is 7.6 LEDs while the median is 4.0. The extent of LED experience is also lower than for CFLs, with just 10.0% of non-participants with LEDs having four or more years of prior experience with this technology; about half of non-participants with LEDs (45.0%) have been using them for two years or less.

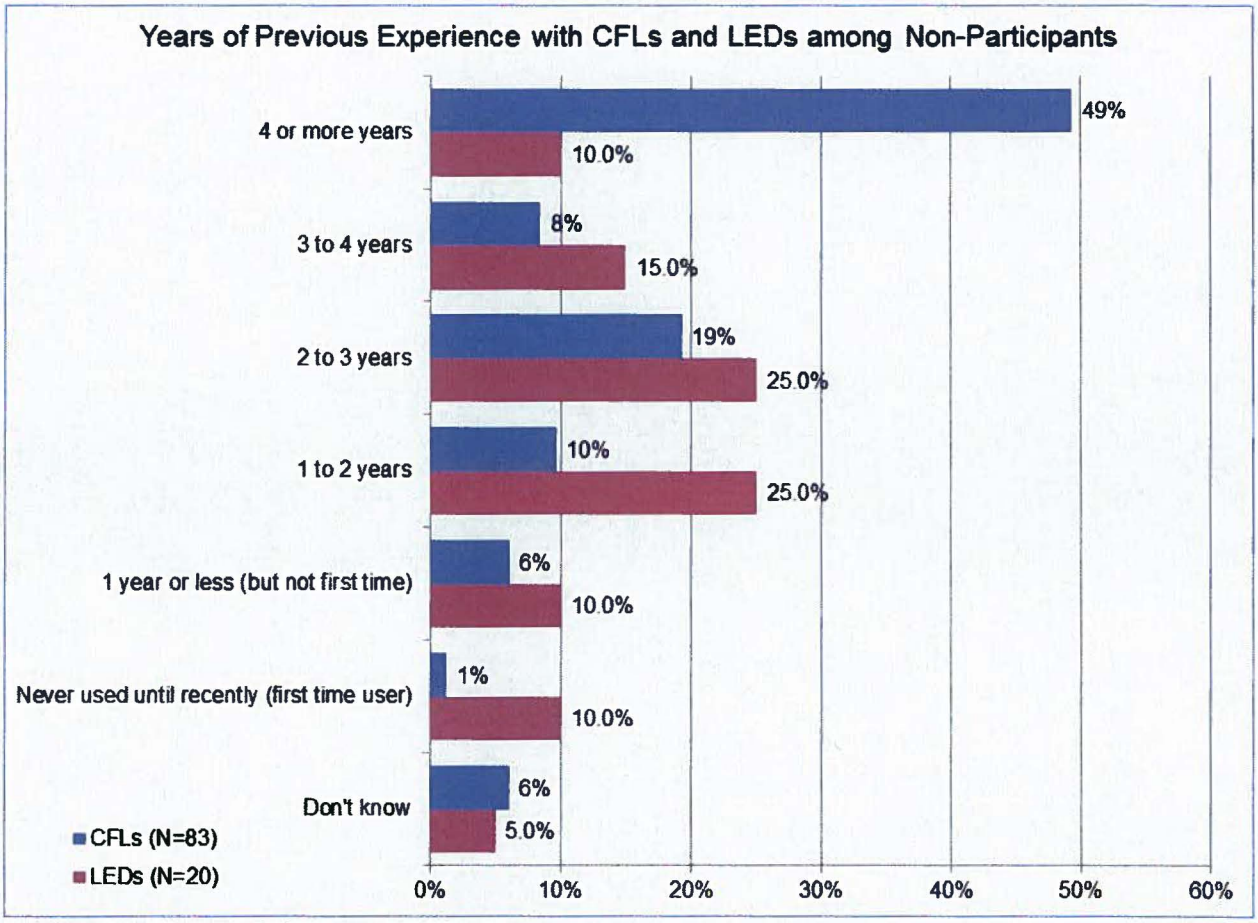

Figure 39. Years of CFL and LED Use

Specialty Bulbs in Non-Participant Households

Surveyed non-participants were asked a series of questions to determine how many specialty bulbs are currently in use in their homes and what kind of bulbs are in those sockets.[35] This can be used to determine opportunities to install further efficient bulbs in these households. Table 83 shows how many non-participants have bulbs of each type in their homes, and the numbers of bulbs in non-participant households.

The most common type of specialty bulb is the candelabra with 55.2% of non-participants reporting they have this type of bulb installed in their homes. Candelabras also represent the type of bulb with the overall greatest number of bulbs installed per household (10.0 per household with this type of bulb installed). Dimmable (53.1%) and globe bulbs (49.0%) round out the top three most common categories of specialty bulb, while CFL and LED A-Line capsules are the least frequently installed bulb type, being present in only 13.5% of non-participant households.

[35] See the footnote on Table 66 in the *Specialty Bulbs in Participant Households* section of this report for caveats on the equivalent program participant analysis which also apply here.

Table 83. Specialty Bulbs Installed in Non-Participant Households

	Non-participant count (N=96)	Non-Participants (percent)	Total bulb count (N=2301.5)	Bulbs (percent)	Bulbs per household with this type of bulb
Dimmable	51	53.1%	435	18.9%	8.5
Three-way	44	45.8%	109	4.7%	2.5
Indoor reflector (recessed)	32	33.3%	280.5	12.2%	8.8
Outdoor reflector (recessed outdoor)	39	40.6%	115	5.0%	2.9
Globe	47	49.0%	369	16.0%	7.9
Candelabra	53	55.2%	529	23.0%	10.0
CFL or LED capsule (A Line)	13	13.5%	92	4.0%	7.1
Other specialty bulbs[36]	45	46.9%	372	16.2%	8.3

Non-participant percentages total to more than 100% because respondents can have multiple types of specialty bulbs.

Table 84 shows how many specialty bulbs of each type installed in non-participant households are CFLs and LEDs. At a glance, dimmable bulbs appear as the type of bulb with the highest percentage of efficient bulbs (39.8%). However this is in part due to an outlier arising from one respondent's claim to have 70 LEDs installed in dimmable sockets. When this data point is removed the percentage of efficient bulbs in dimmable sockets drops to 28.2%, which is more in line with other specialty bulb types. At the other end of the scale, the specialty sockets with the fewest numbers of efficient bulbs installed are outdoor reflectors (12.2%) and candelabras (11.3%).

Table 84. Energy-Efficient Specialty Bulbs in Non-Participant Households

	Total bulb count (N=2301.5)	% bulbs that are Incandescent Halogen	% bulbs that are CFL	% bulbs that are LED	% bulbs that are efficient
Dimmable	435	60.2%	11.5%	28.3%	39.8%
Three-way	109	71.6%	27.5%	0.9%	28.4%
Indoor reflector (recessed)	280.5	74.2%	17.1%	8.9%	26.0%
Outdoor reflector (recessed outdoor)	115	87.8%	12.2%	0.0%	12.2%
Globe	369	77.2%	13.6%	9.2%	22.8%
Candelabra	529	88.7%	10.2%	1.1%	11.3%
CFL or LED capsule (A Line)	92	0.0%	64.1%	26.1%	100.0%[37]
Other specialty bulbs	372	77.7%	2.2%	20.2%	22.3%

Percentages of bulbs total to less than 100% because customers who did not report specific numbers of bulbs are not shown in this table.

[36] The "other" specialty lighting installed in non-participant households includes linear fluorescent tubes, lighting for appliances and aquariums, holiday and decorative lighting, and other specialty applications.
[37] All CFL and LED capsules are efficient; percentages for CFL and LED capsules do not add to 100% because respondents did not specify which type of bulb for 9.8% (9 out of 92) of these installations.

Customers were asked if they have any spare incandescent bulbs in storage to replace specialty bulbs that burn out. As seen in Table 85, candelabra (34.0%) and globe (18.9%) bulbs constitute more than half of the specialty incandescent bulbs these customers have in storage. Candelabras are also the category of incandescent specialty bulb these customers are most likely to have in storage (20.8%) and the specialty bulb type with the largest average number of incandescent bulbs stored per household (5.3). Participants are least likely to have dimmable bulbs (8.3%), and dimmable bulbs only account for 5.8% of incandescent specialty bulbs in storage in these homes.

Table 85. Incandescent Bulbs in Storage for Future Use in Specialty Sockets

	Have incandescents in storage (Count)	Have incandescents in storage (Percent N=96)	Total spare incandescent bulbs (N=312)	Spare incandescent bulbs	Bulbs per household with this type of bulb
Dimmable bulbs	8	8.3%	18	5.8%	2.3
Three-way bulbs	12	12.5%	41	13.1%	3.4
Indoor reflector (recessed)	9	9.4%	40	12.8%	4.4
Outdoor reflector (recessed outdoor)	7	7.3%	30	9.6%	4.3
Globe bulbs	16	16.7%	59	18.9%	3.7
Candelabra bulbs	20	20.8%	106	34.0%	5.3
Other specialty bulbs	5	5.2%	18	5.8%	3.6

Percentages may total to more or less than 100% because respondents can have multiple types of bulbs in storage or none in storage.

Additional Bulb Purchases by Non-Participants

Since learning about the Duke Energy Savings Store, 36.5% on non-participants indicated that they made efficient light bulb purchases from a local retailer or an online merchant other than the Savings Store. Local big box retailers and supermarkets dominate the locations where they made these purchases. A full list of locations and their comparable popularity is shown in Table 86.

Table 86. Additional Bulb Purchases by Retailer

Purchase Location	Count	Percent (N=35)
Home Depot	14	40.0%
Lowe's	9	25.7%
Walmart	8	22.9%
Kroger's	3	8.6%
Sam's Club	2	5.7%
Costco	2	5.7%
Meijer	2	5.7%
Aldi	1	2.9%
Amazon	1	2.9%
EBay	1	2.9%
Exotics & Aquatics (Cincinnati)	1	2.9%
Fred Meyer	1	2.9%
Harbor Freight	1	2.9%
Menards	1	2.9%
Rose's Market	1	2.9%
Target	1	2.9%
True Value	1	2.9%

Percentages total to more than 100% because multiple responses were accepted.

Standard spiral CFLs (33.1%) and CFL A-Line capsules (24.7%) account for the largest number of efficient bulbs purchased by non-participants after learning about the program, accounting for the majority (57.8%) of additional efficient light bulbs purchases. Respondents who purchased additional bulbs bought an average of 7.9 efficient bulbs apiece, of which they installed an average of 5.2 bulbs (65.8% of bulbs purchased) and have an average of 2.7 in storage for later use. Specific types of bulbs purchased are shown in Table 87, while the number and types of bulbs installed and kept in storage are shown in Table 88 and Table 89.

Table 87. Number of Additional Bulbs Purchased by Non-Participants

Bulbs*	# Responses	# Purchased	% Purchased	Average Size Purchase
CFL - Standard spiral	12	91	33.1%	7.6
CFL - Capsule (A Line)	2	68	24.7%	34.0
CFL - Indoor Reflector (recessed)	1	2	0.7%	2.0
CFL - Outdoor reflector (recessed outdoor)	0	0	0.0%	0.0
CFL - Globe	1	1	0.4%	1.0
CFL - Candelabra	0	0	0.0%	0.0
CFL - Dimmable	2	7	2.5%	3.5
CFL - Three-way spiral	2	3	1.1%	1.5
LED - Standard or capsule (A Line LED)	5	19	6.9%	3.8
LED - Indoor reflector (recessed LED)	2	9	3.3%	4.5
LED - Outdoor Reflector (Recessed Outdoor LED)	1	3	1.1%	3.0
LED - Globe	1	9	3.3%	9.0
LED - Candelabra	0	0	0.0%	0.0
LED - Three-way	0	0	0.0%	0.0
Other type of CFL or LED bulb	9	63	22.9%	7.0
Totals	**35**	**275**	**100.0%**	**7.9**

Responses by row total to more than 35 because respondents could buy more than one type of light bulb.

Table 88. Number of Additional Bulbs Installed by Non-Participants

Bulbs*	# Responses	# Installed	% Installed	Average # Installed
CFL - Standard spiral	12	72	39.9%	6.0
CFL - Capsule (A Line)	2	8	4.4%	4.0
CFL - Indoor Reflector (recessed)	1	2	1.1%	2.0
CFL - Outdoor Reflector (recessed outdoor)	0	0	0.0%	0.0
CFL - Globe	1	1	0.6%	1.0
CFL - Candelabra	0	0	0.0%	0.0
CFL - Dimmable	2	5	2.8%	2.5
CFL - Three-way spiral	2	3	1.7%	1.5
LED - Standard or capsule (A Line LED)	5	14	7.5%	2.7
LED - Indoor reflector (recessed LED)	2	7	3.9%	3.5
LED - Outdoor Reflector (Recessed Outdoor LED)	1	3	1.7%	3.0
LED - Globe	1	9	5.0%	9.0
LED - Candelabra	0	0	0.0%	0.0
LED - Three-way	0	0	0.0%	0.0
Other type of CFL or LED bulb	9	57	31.6%	6.3
Totals	**35**	**181**	**100.0%**	**5.2**

Responses by row total to more than 35 because respondents could buy more than one type of light bulb.

Table 89. Number of Bulbs Kept in Storage by Non-Participants

Bulbs*	# Responses	# In Storage	% In Storage	Average # In Storage
CFL - Standard spiral	12	19	20.1%	1.6
CFL - Capsule (A Line)	2	60	63.5%	30.0
CFL - Indoor Reflector (recessed)	1	0	0.0%	0.0
CFL - Outdoor Reflector (recessed outdoor)	0	0	0.0%	0.0
CFL - Globe	1	0	0.0%	0.0
CFL - Candelabra	0	0	0.0%	0.0
CFL - Dimmable	2	2	2.1%	1.0
CFL - Three-way spiral	2	0	0.0%	0.0
LED - Standard or capsule (A Line LED)	5	6	5.8%	1.1
LED - Indoor reflector (recessed LED)	2	2	2.1%	1.0
LED - Outdoor Reflector (Recessed Outdoor LED)	1	0	0.0%	0.0
LED - Globe	1	0	0.0%	0.0
LED - Candelabra	0	0	0.0%	0.0
LED - Three-way	0	0	0.0%	0.0
Other type of CFL or LED bulb	9	6	6.3%	0.7
Totals	**35**	**95**	**100.0%**	**2.7**

Responses by row total to more than 35 because respondents could buy more than one type of light bulb.

Non-participants who bought bulbs outside of the program were asked to explain why they had made their purchases somewhere other than the Savings Store. The most common reasons were that customers did not think to visit the Store (22.9%) or that they found lower prices elsewhere (22.9%). This was followed by the convenience of buying in a local store (17.1%) and finding the Store did not carry the bulbs the customer was looking for (17.1%). Table 90 shows the range of reasons given.

Table 90. Non-Participant Reasons for Buying Bulbs Elsewhere

Response	Count	Percent (N=35)
Prices too high compared to elsewhere	8	22.9%
Unaware/did not think to do so	8	22.9%
Convenience: Bought bulbs because was already at a store that sold them	6	17.1%
Store did not have desired bulbs	6	17.1%
Did not want to pay for shipping	4	11.4%
Needed now/did not want to wait for shipping.	3	8.6%
Do not shop online	3	8.6%
Do not own a computer	1	2.9%
Could not find the Savings Store	1	2.9%
Prefer shopping in stores	1	2.9%
Too busy	1	2.9%

Note: Multiple responses were allowed per participant.

When asked to rate the Savings Store's influence on their decision to buy energy efficient bulbs at another location, non-participants give mixed responses. Overall their average influence rating is 4.7 on a ten-point scale where "10" indicates the most influence, but the distribution is bi-modal with most respondents either giving the lowest "1 out of 10" rating (37.1%) or the highest "10 out of 10" rating (22.9%). The full range of ratings is shown in Figure 40.

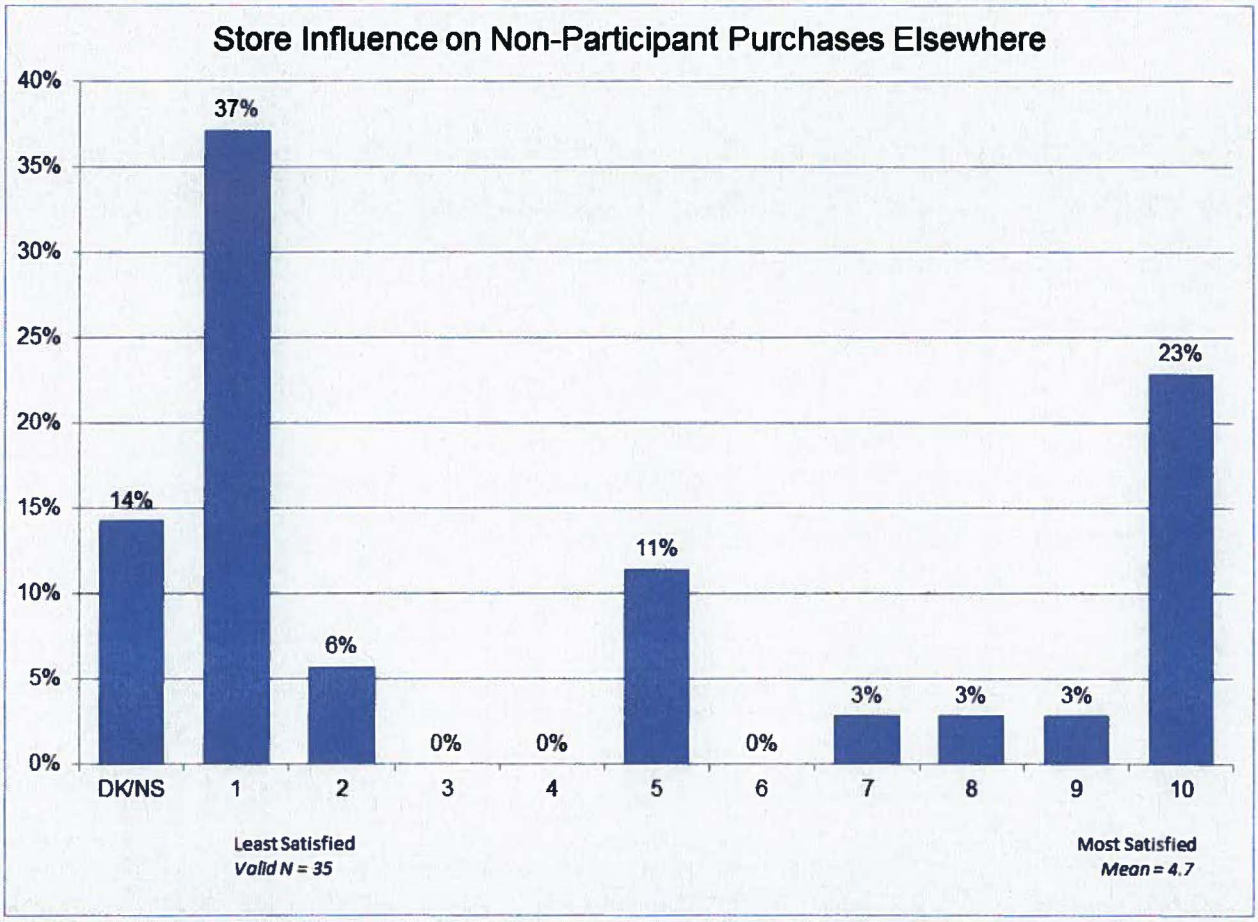

Figure 40. Store Influence on Non-Participant Purchases Elsewhere

When asked why they rated the Savings Store's influence on their additional bulb purchases as they did, survey respondents gave a variety of reasons ranging from not thinking of the Store while making a purchase to directly referencing Store prices in comparison with other retailers. A representative sampling of non-participant reasons is shown below.

- *The Saving Store had no influence on my purchase.*
- *I wasn't thinking about the store.*
- *I didn't consider the Savings Store an option because I don't own a computer and can't access the online store.*
- *If they had them at the Savings Store I would have bought them there.*

- *I knew Duke was selling the dimmable CFLs at $6 so I knew that $2 a piece was a very good deal.*
- *People don't buy bulbs until they need them. Unless you start thinking ahead, you're talking about factoring in shipping time. So when you don't have a spare, the light is out until you get one. That's the disadvantage of the Duke Store for some people.*

Future Light Bulb Purchase Intentions

Surveyed non-participants were asked how many of the next ten light bulbs they purchase will be standard incandescent (or halogen), CFL and LED bulbs. As seen in Table 91, two-thirds of non-participants surveyed (65.9%) report that they intend to buy CFLs and more than a third (38.5%) intend to purchase LEDs, while fewer than one in four (22.0%) say that they intend to buy any standard incandescent or halogen bulbs. However, only seven surveyed non-participants (7.7%) intend to purchase exclusively incandescent and halogen light bulbs for their next ten bulbs.

The majority of bulbs these customers intend to purchase in the future will be CFLs (54.5%) or LEDs (28.9%) and only about one bulb in six (16.6%) will be incandescent or halogen. Though these customers did not purchase light bulbs from the Savings Store, they show an overwhelming preference for purchasing efficient lighting; this indicates that program marketing is doing an excellent job of reaching the intended target of customers who are already in the market for efficient bulbs.

Table 91. Purchase Intent: Next Ten Bulbs Purchased

Of the Next Ten Light Bulbs You Purchase, How Many Will Be...?	**All Surveyed Non-Participants Who Answered This Question** (Valid N=91)
% of surveyed customers who intend to buy at least one incandescent and/or halogen bulb	22.0%
% of surveyed customers who intend to buy at least one CFL bulb	65.9%
% of surveyed customers who intend to buy at least one LED bulb	38.5%
	All Bulbs To Be Purchased (N=890)[38]
Percentage of next ten bulbs that will be incandescent and/or halogen bulbs	16.6%
Percentage of next ten bulbs that will be CFL bulbs	54.5%
Percentage of next ten bulbs that will be LED bulbs	28.9%

Percentages in the first three rows total to more than 100% because respondents could give multiple responses. Percentages in the bottom three rows are mutually exclusive and add up to 100%.

Figure 41 presents the distribution of future bulb purchases in the form of an area chart as a visual aid: the Y-axis shows the distribution of bulbs intended to be purchased, and the X-axis

[38] All 96 respondents were asked the question about the next ten bulbs they intend to purchase. Five respondents said they "don't know" what any of their next ten bulbs purchased will be, and across the other 91 respondents there were another 20 "other types" of bulbs which do not fit any of the major bulb categories. When calculating the percentage of incandescent/halogen, CFL and LED bulbs purchased, "don't know" and "other" bulbs are not included in the analysis. Thus the base number of intended bulb purchases is 890 bulbs (10 bulbs times 91 respondents minus 20 "other" bulbs).

shows all 91 valid responses sorted by the distribution of bulb types. More than a third (36.3%) of these non-participants intend to purchase exclusively CFLs for their next ten bulbs (the center green area which extends from the top to the bottom of the chart).

The chart also shows significant intentions to purchase LEDs (the blue area on the right of the chart), including 15.4% of non-participants who intend to purchase LEDs exclusively the next time they need light bulbs (where the blue area extends from the top to the bottom of the chart).

Intentions to purchase incandescent and halogen bulbs among these customers is limited (red areas of the chart): only 8.8% intend to purchase exclusively incandescent and halogen bulbs (the area where the red extends from the top to the bottom of the chart), and only 18.7% intend to purchase even half incandescent and halogen bulbs out of the next ten bulbs purchased. There are also a handful of customers who still intend to purchase the old standard bulbs in addition to both LEDs and CFLs (the "red spikes on the blue stairs" on the right side of the chart), including four customers (4.4%) who intend to purchase only LEDs and incandescent bulbs but not any CFLs.

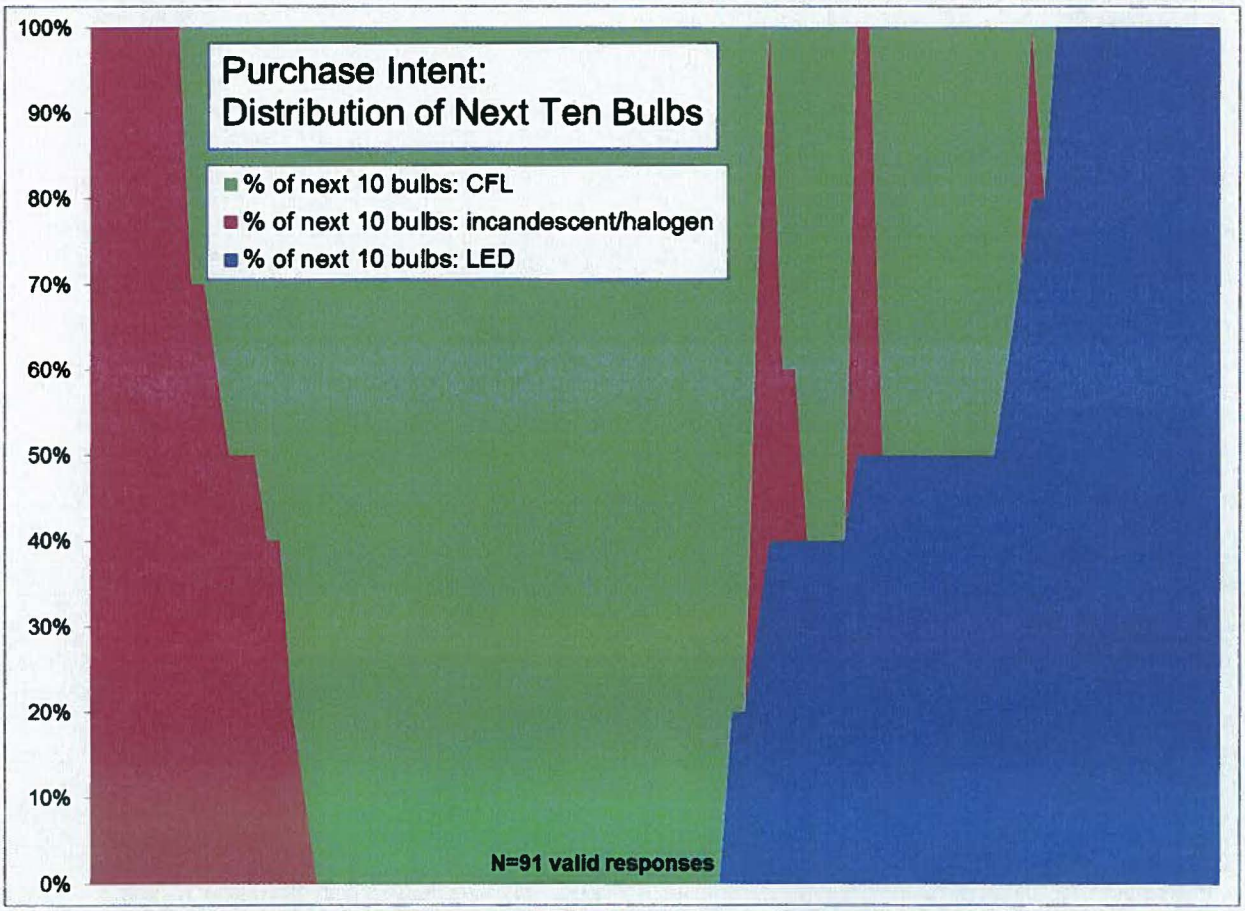

Figure 41. Area Chart of Intentions for Next Ten Bulbs Purchased (N=91)
Five non-participants (5.2% of 96 surveyed) "don't know" what kind of bulbs they will buy in the future and are not included in this chart.

Additional Energy Saving Actions Taken by Non-Participants

Despite not purchasing any energy efficient bulbs from the Duke Energy Savings Store, 36.5% of non-participants affirmed that they had taken at least one additional energy-saving action since visiting the Store or since seeing marketing messages encouraging them to visit. The most common actions were weatherizing homes, buying and installing more efficient lighting, and adjusting HVAC settings to save energy. Other responses are shown in Table 92.

Table 92. Additional Energy Saving Actions Taken by Non-Participants

Action	Count	Percent (N=35)
Weatherize home	9	25.7%
Buy and use more efficient lighting	8	22.9%
Adjust HVAC settings	8	22.9%
Turn off lights	7	20.0%
Bought new HVAC	5	14.3%
Added insulation	4	11.4%
Added new windows	4	11.4%
More efficient appliances	4	11.4%
Unplug when not in use	4	11.4%
Added window coverings	3	8.6%
Bought more efficient electronics	2	5.7%
Signed up for Power Manager	2	5.7%
Signed up for MyHER	1	2.9%
Behavior change	1	2.9%
Added solar for hot water	1	2.9%
Bought new thermostat	1	2.9%
Adjusted freezer settings	1	2.9%
Made electrical upgrades	1	2.9%

Note: Multiple responses were allowed per participant.

Future Purchases Specifically at the Energy Savings Store

Non-participants were asked about their future intentions to shop for efficient bulbs at the Savings Store; a quarter of surveyed non-participants (26.0%) said that they are confident that they will shop for specialty bulbs from the Savings Store in the future, and one third (32.3%) said they will probably do so. Another 31.3% report they may or may not shop at the Store, while only 10.4% indicated that they were not likely to shop at the Savings Store in the future. There are no statistically significant differences between non-participants who visited the Store and those who did not (Figure 42).

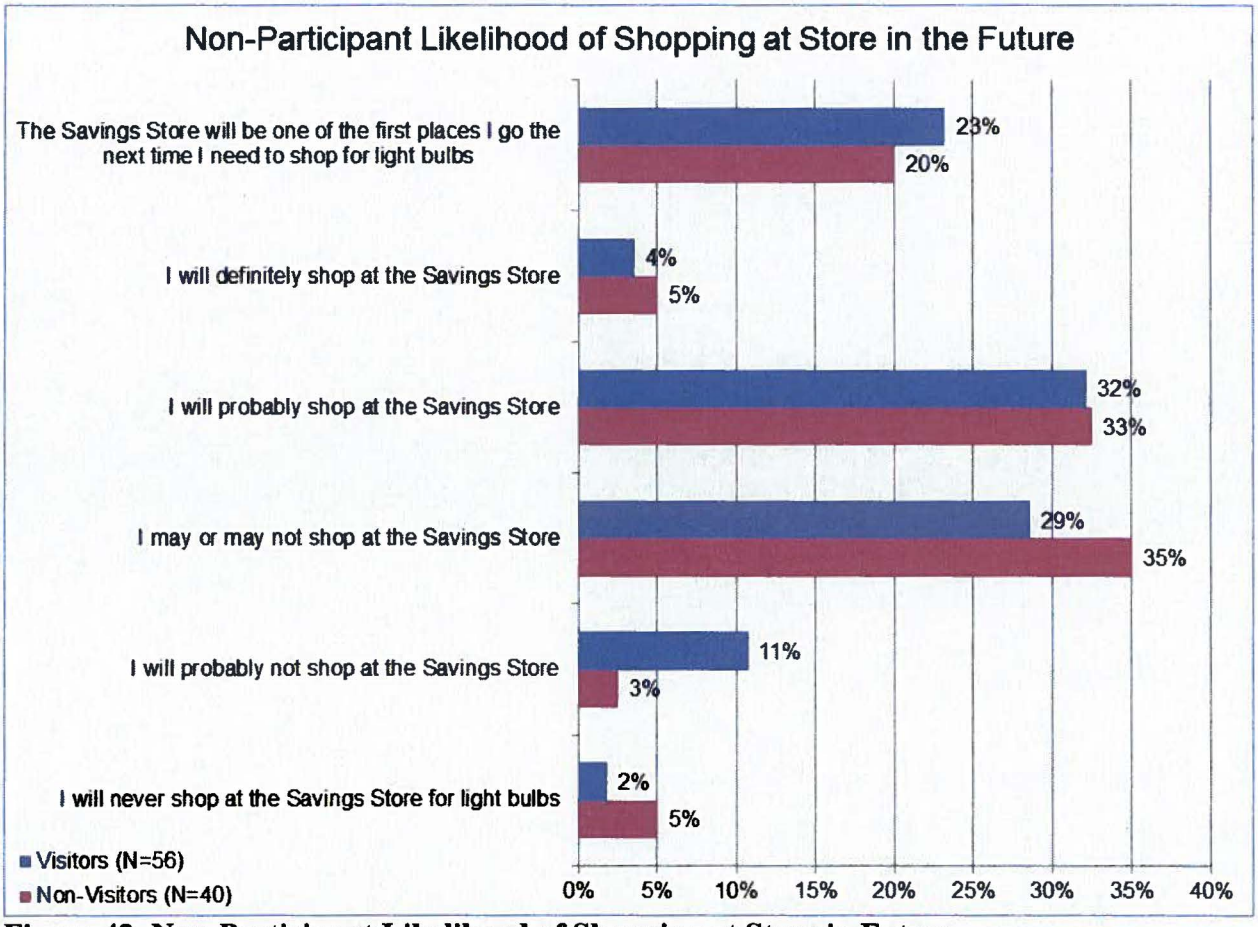

Figure 42. Non-Participant Likelihood of Shopping at Store in Future

When asked to explain their future purchase intentions for the Savings Store, respondents provided a range of answers that distill down to a dozen or so reasons as shown in the table below.

Table 93. Reasons for Likelihood of Shopping at Store

Sentiment	Reasons	Count	Percent (N=96)
Likely to visit and buy	Like the Store's prices	18	18.8%
Likely to visit and buy	Like online convenience	10	10.4%
Likely to visit and buy	Like the Store's inventory	6	6.3%
Likely to visit and buy	Like to save energy	1	1.0%
Neutral	Will shop for lowest prices	20	20.8%
Neutral	Will shop based on convenience	5	5.2%
Neutral	Want more information first	3	3.1%
Neutral	May or may not recall the Savings Store	3	3.1%
Neutral	Other/nonspecific response	8	8.3%
Not likely to visit and buy	Prefer to shop in retail stores	5	5.2%
Not likely to visit and buy	Will not shop online	4	4.2%
Not likely to visit and buy	Do not want to pay for shipping	3	3.1%
Not likely to visit and buy	Do not own a computer	1	1.0%

Note: Multiple responses were allowed per participant.

Suggestions to Increase Future Store Purchases

Non-participant customers were asked "*What do you think could be done to get more people such as yourself to buy light bulbs from the Savings Store?*" Increased advertising was by far the most frequently mentioned idea with 41.7% of all non-participants suggesting it. This was followed by lower prices, free shipping, and extra savings via sales or coupons. Table 94 provides a summary of suggestions.

Table 94. Non-Participant Suggestions to Increase Store Purchases

Response	Count	Percent (N=96)
Increased marketing/advertising	40	41.7%
Greater discounts/lower prices	21	21.9%
Free/lower cost shipping	15	15.6%
Limited time extra savings deals/coupons	12	12.5%
No suggestions	11	11.5%
Offer free sample bulbs	8	8.3%
Increased product selection	3	3.1%
Sell in physical stores	3	3.1%
Emphasize benefits of using bulbs	3	3.1%
Easier website	2	2.1%
On bill financing/payments	2	2.1%
Take phone orders	2	2.1%
Simplified log in process	1	1.0%
Use telemarketing	1	1.0%

Note: Multiple responses were allowed per participant.

Representative customer suggestions are listed below.

- *Advertise and encourage people to visit the store from Duke's regular website. Offer specials such as buy one and get one free or free shipping.*
- *Continue to offer discounts and an occasional free bulb offer.*
- *Have an easy to use website. Free shipping. Good prices. Use a nice looking model like George Clooney.*
- *Have TV ads emphasizing the advantages of using these bulbs such as being better for the environment by using less energy, the quality of the lights, and paying less on one's bill. Have a kiosk at the mall.*
- *I think pricing is the determining factor in people's purchasing decisions.*
- *I'd prefer to go to a local place, a store that I already trust and shop from, to be able to compare the existing bulbs available at the store to bulbs that are offered thru the Savings Store. Perhaps some in-store advertisements in the light bulb aisle will inspire me to buy from Duke Energy.*
- *Make it easier to click to get directly to the site and be able to shop, don't ask for account information and other qualifications from the customer before. Perhaps just asking for a customer zip code is enough to access the site. Having to enter all of this information to be allowed or qualified to just look at the website discourages most people to continue with any further shopping.*
- *More advertising. Make sure people see it somewhere on-line; most people shop there. Pop-up ads would work. Also try to reach people through Netflix and cable commercials. Even add more paper inserts in bills.*
- *Offer a few free bulbs. I would like to see if the bulbs arrive safely. When I received the 12 pack of free CFLs from Duke four of them arrived broken.*
- *Perhaps have an option for the people who don't want or can't use a computer. Allow people to order the bulbs over the phone and provide a catalog which could be sent in the mail.*
- *Improve the placement of the Saving Store link on electronic bill; put it in a more prominent position on the bill so people can see it. Also, for older people, they will not buy anything on line or pay bills on line. I would put out a catalog with the available bulbs and a phone number to call to order them. It could be more expensive than online but overall it would help if the intent is to get more customers. Older people don't trust computers. Often people will fill out the order online and then call to finish the order. Also, if they had direct billing on the bulbs as a separate item that would increase your business tremendously; you would sell many more bulbs. Or, set up a payment plan in case people want to buy many at once; that can run into money. Give them the option to pay at once or over a three-month period. It would be cheaper for Duke; you would sell more, and get better prices from your manufacturers. You could also get it across to your customers that you're saving them money in the long run, and especially that you don't have to replace the bulbs as often. The key is education of customers: prove the value with facts.*

Key Findings

- Among all non-participants, satisfaction with Duke Energy averaged 7.7 on a 10 point scale. More than one third (37.5%) of non-participants who did not visit the site said they feel more positively about their utility after learning about the Savings Store, but a majority (60.0%) indicated that they feel about the same.
    - See section titled *Satisfaction with Duke Energy* on page 174 and *Non-Visitor Attitudes toward Duke Energy* on page 172.

- Of those respondents who actually visited the Savings Store, satisfaction with the website overall averaged 8.1 on a 10 point scale, while satisfaction with the Store's prices averaged 7.4. Despite not making a purchase, non-participants rated the ease of website navigation at an average of 8.9 and the helpfulness of bulb descriptions at 8.6.
    - See section titled *Overview* on page 147.

- Overall, visiting non-participants visited the Store at an average of 2.2 times each. When asked why they visited the Savings Store without making a purchase, a majority (53.6%) indicated that they came out of curiosity; 26.8% said they'd visited specifically to check Duke Energy's prices; and 21.4% said they were making price comparisons with other retailers. Another 25.0% did not need efficient bulbs at the time.
    - See section titled *Website Visitation* on page 151.

- Because non-participants did not make a purchase from the Savings Store, the survey asked if they preferred to purchase specialty bulbs via another method. A clear majority (60.7%) said they did not, but 35.7% would have preferred a different option. Among those who said they preferred another method, nearly all (85.0%) said they preferred to shop in retail stores.
    - See section titled *Alternate Methods of Buying Specialty Bulbs* on page 167.

- CFL use is high among non-participants. Some 86.5% had CFLs installed in their homes prior to learning about the Savings Store, and about half (49.4%) of customers with CFLs have been using them for four or more years. LED use is considerably lower at only 20.8% of non-participants, with just 10.0% of those with LEDs installed having four or more years of experience with this technology.
    - See section titled *Years of Previous Experience with Energy Efficient Bulbs* on page 176.

- Despite not yet making a purchase from the Savings Store, more than one quarter (26.0%) of non-participants said they confidently planned to buy specialty bulbs from the Savings Store in the future, and an additional 32.3%% said they would probably do so.
    - See section titled *Future Purchases Specifically at the Energy Savings Store* on page *187*.

- More than one third (36.5%) of non-participants affirmed that they had taken at least one additional energy-saving action since visiting the Store or since seeing marketing messages encouraging them to visit. The most common actions were weatherizing

homes, buying and installing more efficient lighting, and adjusting HVAC settings to save energy.

- See section titled *Future Light Bulb Purchase Intentions* on page 185.

Recommendations

Duke Energy's non-participant customers made the following requests for program and website improvement. TecMarket Works concurs with these suggestions.

- Expand inventory to include brighter LEDs to enable displacement of higher wattage incandescent and halogen bulbs.
- Create an interactive way to compare CFLs and LEDs to incandescent equivalents, including wattage, brightness, color, price, energy savings, bulb life, etc.
- Enable Store visitors to search and sort by wattage equivalents. Such a feature would be helpful to those potential bulb buyers who are more familiar with buying bulbs based upon wattage numbers as they have done in years past.
- Increase customer confidence in purchases by expanding the product descriptions to more clearly denote bulb base types and to better explain which bulbs are best used for which applications.
- Review website site language and simplify potentially confusing technical language to more layman's terms.
- Provide more prominent explanations regarding bulb warranties.
- Consider an option for customers to make payments via PayPal.
- Respondents offered a number of suggestions for expanding the Store's inventory of energy efficient items, including: a greater variety of LEDs and other kinds of CFL bulbs for currently unaddressed specialty applications such as bright/higher wattage equivalents and more outdoor and landscape lighting. They also suggested non-lighting energy efficiency devices including "smart home" devices, weatherization items, and other devices to control lighting, such as timers and motion detectors.

Participant and Non-Participant Survey Comparisons

This section compares survey results between the program participants (customers who purchased Savings Store bulbs) and non-participants (customers who did not purchase specialty bulbs at the Savings Store) from surveys conducted with both Duke Energy Ohio and Duke Energy Kentucky customers. Non-participants are further subdivided into two groups: non-participant visitors (those who visited the Savings Store) and non-participant non-visitors (those who received program marketing materials but did not visit the Savings Store).

Satisfaction Ratings

As expected, participants are significantly more satisfied with the price of lightbulbs (9.41) and the Store overall (9.22) compared to non-participants who visited the website (7.38 for prices and 8.07 for the Store overall), as seen in Figure 43 and Table 95. This result is expected because participants followed through and made a decision to buy, while web visiting non-participants elected to not buy. Non-participants (both Store visitors and non-visitors) also give a significantly lower satisfaction rating for Duke Energy overall (7.73) compared to program participants (8.44). However, there are no significant differences between participants and non-participants who visited the Store in terms of their ratings for other specific areas of the program such as website usability, bulb descriptions, savings estimates and finding desired items. This indicates that the primary barrier for non-participants is their perception of the price of light bulbs sold at the Savings Store; for participants, the price of bulbs is the most highly-rated area of the Store, and bulb prices are the primary reason that they shopped there. For non-participants who visited the Store and saw the prices, the price of bulbs is the lowest-rated aspect of the program.

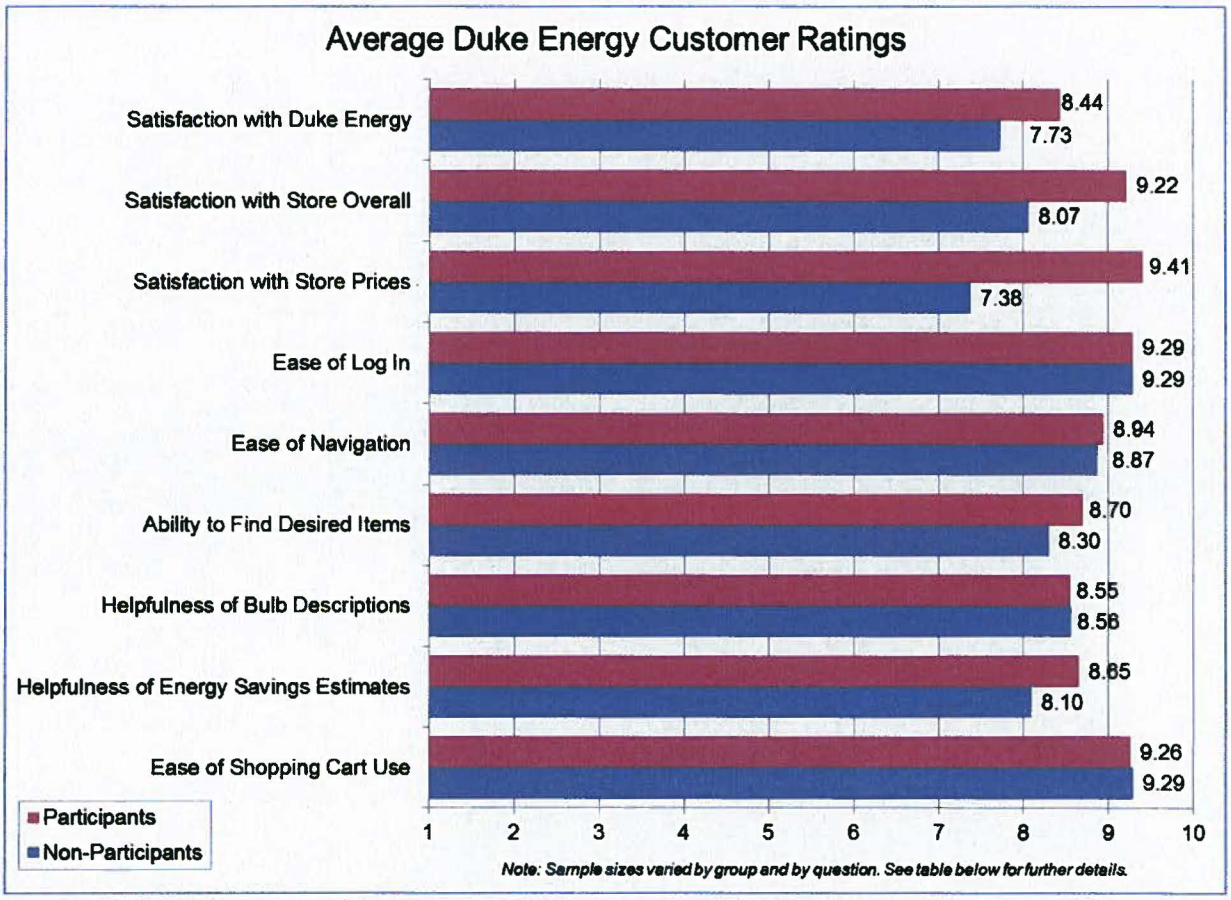

Figure 43. Comparison of Satisfaction and Agreement Ratings

Sample sizes vary for each rating and are shown in Table 95 along with statistical significance levels (non-participants were only asked to rate aspects of the Savings Store if they visited the website, and non-participants visitors were only asked to rate the shopping cart if they used that feature).

Table 95. Comparison of Ratings between Participants and Non-Participants

All ratings are on a ten-point scale where "10" is best and "1" is worst	Participants		Non-participants	
	Mean Rating	Valid N	Mean Rating	Valid N
Satisfaction with Duke Energy	8.44**	204	7.73**	96
Satisfaction with the Savings Store Overall	9.22**	206	8.07**	55
Satisfaction with Store Prices	9.41**	205	7.38**	52
Ease of Log In	9.29	194	9.29	55
Ease of Navigation	8.94	194	8.87	55
Ability to Find Desired Items	8.70	191	8.30	50
Helpfulness of Bulb Descriptions	8.55	191	8.56	50
Helpfulness of Bulb Energy Savings Estimates	8.65	154	8.10	42
Shopping Cart Use	9.26	189	9.29	14

** denotes statistically significant difference between groups at p<.10 using Student's t-test;*
*** denotes statistically significant difference between groups at p<.05 using Student's t-test.*

Customer Awareness

For participants and non-participants who did not visit the Savings Store, mailings are the most frequently recalled source of awareness about the program. However, for non-participants who did visit the Store, the most common source of awareness is the Duke Energy website (51.8%), which is significantly higher than the percent of participants (27.7%) and non-visiting non-participants (17.5%) who learned about the Store ($p<.05$ using Student's t-test). This suggests that the non-participant visitors tend to be active online and that shopping online is not a barrier to their participation.

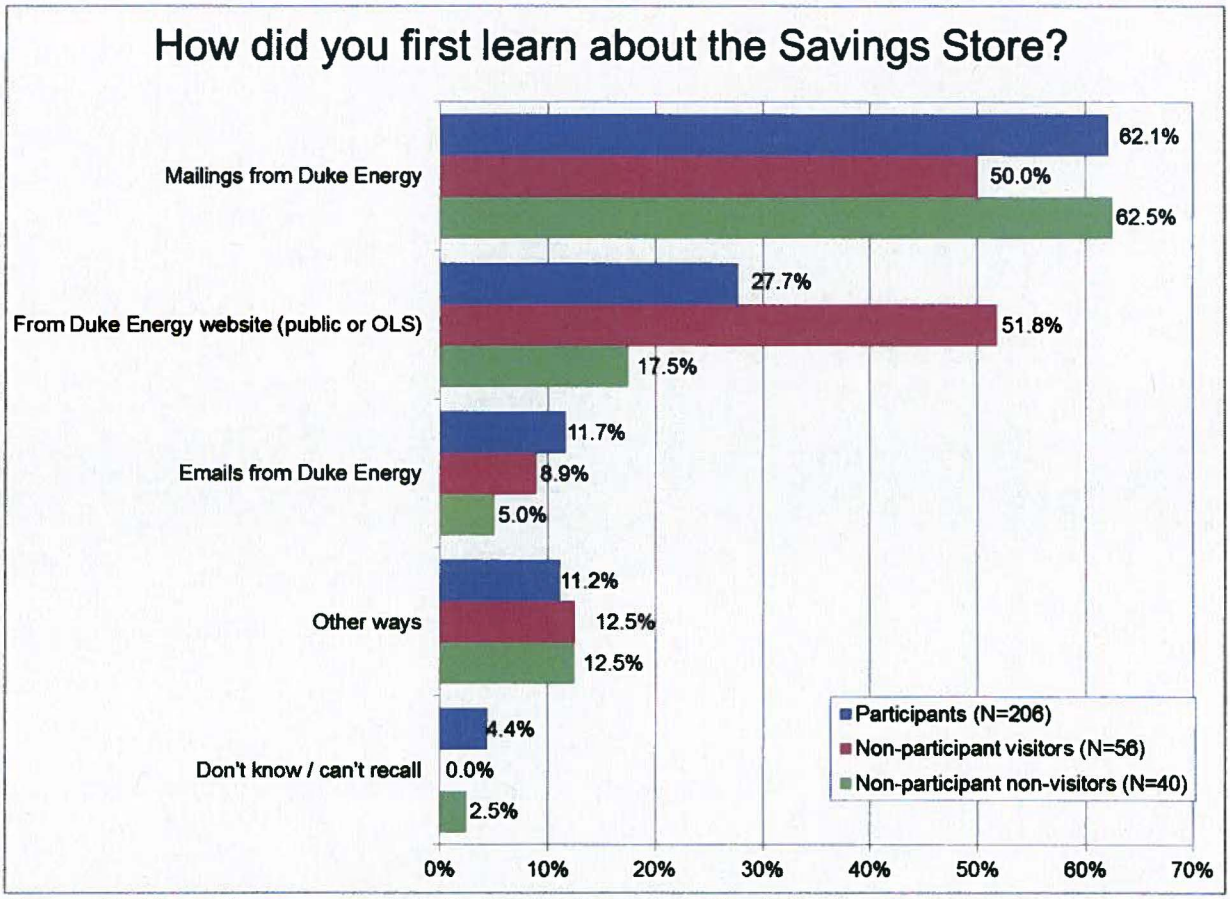

Figure 44. How Customers First Learned About the Savings Store
Note: Multiple responses were allowed per participant.

Years of CFL and LED Use by Participants and Non-Participants

Both program participants and non-participants report considerable previous experience with energy efficient lighting, which is to be expected given that Duke Energy specifically markets the Savings Store to customers who have more experience with efficient lighting. The distribution of efficient light bulbs installed in participant households before the program and non-participant households is shown in Figure 45. Program participants had an average of 12.8 efficient light bulbs (CFLs and LEDs) installed in their homes before purchasing Savings Store bulbs, compared to 16.2 efficient bulbs in non-participant visitor homes and 14.2 efficient bulbs in non-participant non-visitor homes; the median number of efficient bulbs installed is 12.0 bulbs for non-participant visitors, 11.5 for non-participant non-visitors and only 10.0 bulbs for participants. Although the mean number of bulbs is not significantly different between these groups, a significantly larger percentage of non-participants report having 15 or more efficient bulbs before the program (41.7% combined for visitors and non-visitors) compared to participants (33.0%; this difference is significant at $p<.10$ using Student's t-test).

This could indicate that the non-participant group is farther along in adopting efficient lighting technology, however two caveats should be noted: First, these questions are not specifically about specialty bulbs (versus "standard" bulbs). As the next section will show, participant

households report having a greater number of specialty sockets than non-participant households; since standard bulbs are not intended for specialty sockets, a home with a larger proportion of specialty sockets may have had fewer efficient bulbs installed (prior to becoming aware of the efficient bulbs available through this program). Secondly, there are other factors such as home size and household income which may also be related to differences between participant and non-participant groups (i.e., a larger home will have more lighting thus a larger number of efficient bulbs can be installed; this analysis is based on the total number of efficient bulbs per household, not the percentage of sockets with efficient bulbs).

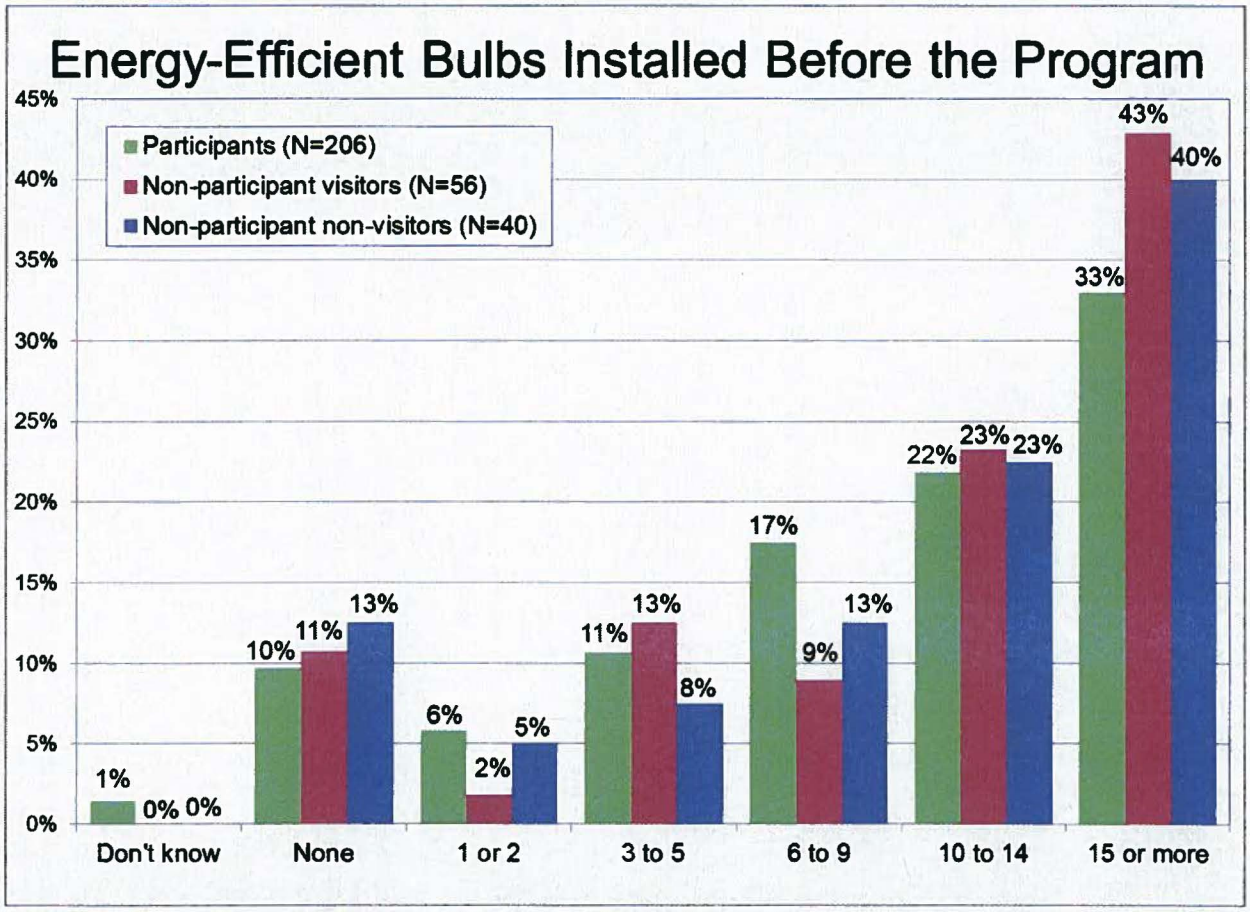

Figure 45. Numbers of Energy-Efficient Light Bulbs in the Household

Figure 46 shows how long participants and non-participants had been using CFLs (prior to program participation in the case of participants, virtually all of whom purchased CFLs from the Savings Store). These groups' experience with CFLs is equivalent, with only 10.7% to 17.5% of each group not having had any previous experience with CFLs (prior to the program), and the largest proportions of each group has been using CFLs for at least four years. Only 37.5% of non-visiting non-participants have four or more years' experience with CFLs which is not significantly different from the 46.4% of visitor non-participants with equivalent experience, but it is less than the 51.0% of program participants who have at least four years' experience with CFLs ($p<.10$ using Student's t-test).

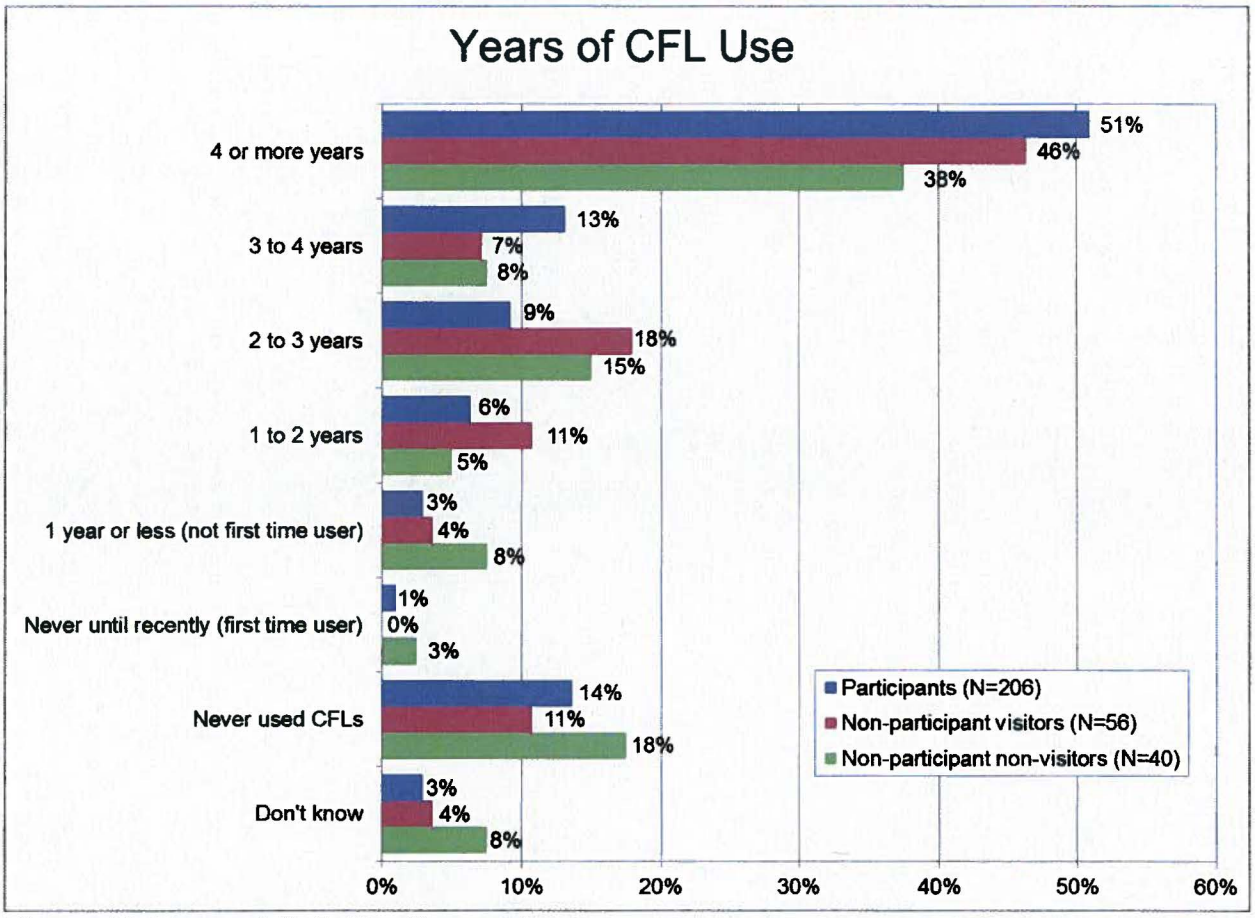

Figure 46. Years of CFL Use Comparison

Currently, far fewer customers are using LEDs than CFLs, with minorities of participants (24.3%), non-participant visitors (16.1%) and non-participant non-visitors (25.0%) having used LEDs (Figure 47). Non-participant visitors are less likely than participants to have LEDs ($p<.10$ using Student's t-test) though they are not significantly different from non-visitor non-participants (due to smaller sample sizes). Combining the subgroups, 20.8% of all non-participants surveyed had LEDs installed which is not significantly different from 24.3% for the participant group.

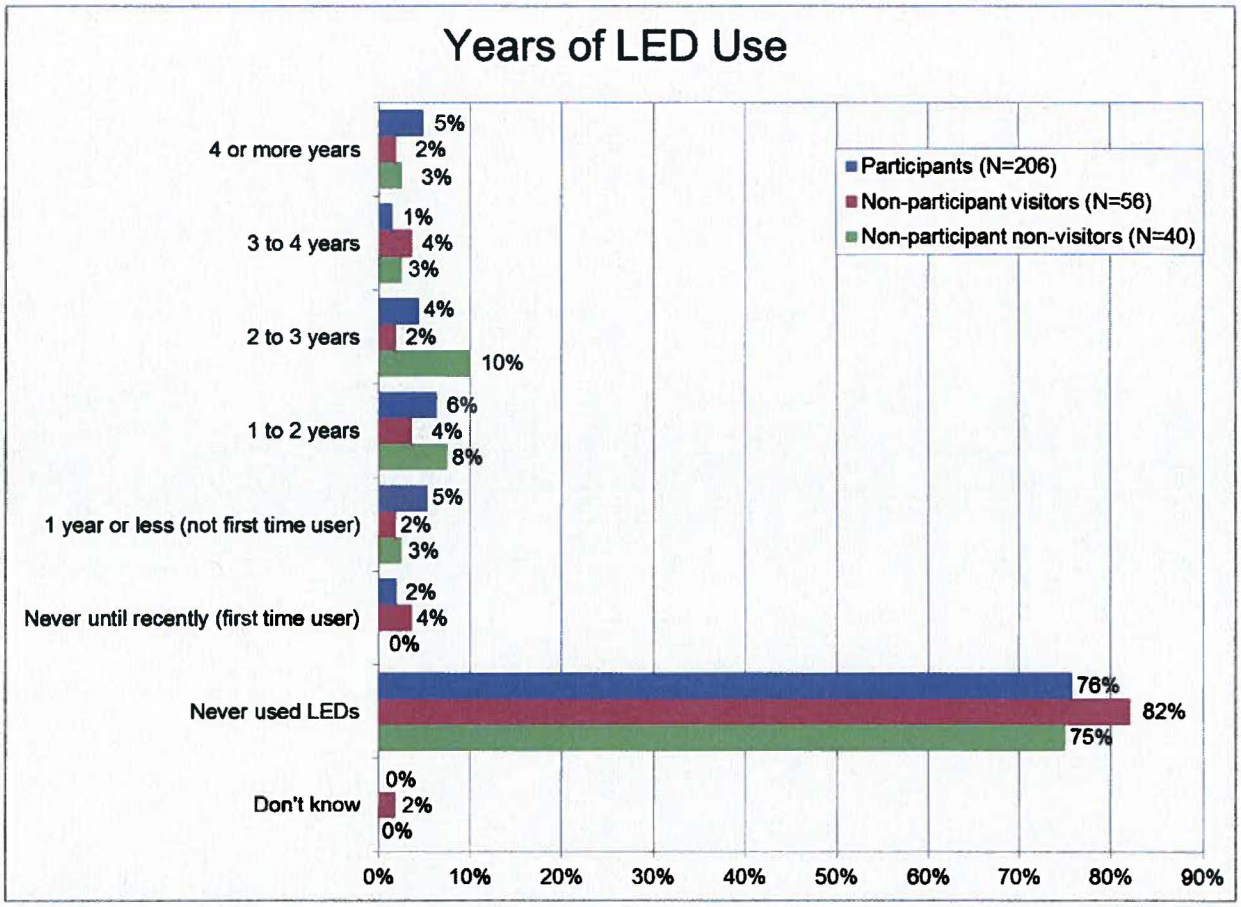

Figure 47. Years of LED Use Comparison

Specialty Bulbs in Participant and Non-Participant Households

Program participants are significantly more likely to have specialty bulbs installed in their homes than non-participants. This indicates that the need for light bulbs is a key driver of Savings Store sales, not just in situational terms (a customer's bulbs have burned out and they need to replace them right away) but in structural terms (a customer does not need to buy candelabra bulbs unless they have a fixture that uses candelabra bulbs).

Table 96 compares the specialty bulbs installed in participant and non-participant households. Participant households are significantly more likely to have all types of specialty bulbs installed, except for the miscellaneous category of "other" specialty bulbs ($p<.05$ using Student's t-test for all bulb categories except "other"). The largest differences are efficient capsule bulbs (currently installed in 55.8% of participants' homes but only 13.5% of non-participants') and indoor reflector bulbs (68.0% of participants and 33.3% of non-participants). Among households with a given type of specialty bulb installed, program participants tend to have more bulbs of each type compared to non-participants; however these differences are not significant.

Table 96. Specialty Bulbs Installed in Participant and Non-Participant Households

	Participants (N=206)		Non-Participants (N=96)	
	Percent of households	Bulbs per household with this type of bulb	Percent of households	Bulbs per household with this type of bulb
Dimmable	69.4%	9.8	53.1%	8.5
Three-way	58.3%	3.4	45.8%	2.5
Indoor reflector (recessed)	68.0%	11.2	33.3%	8.8
Outdoor reflector (outdoor recessed)	59.7%	4.0	40.6%	2.9
Globe	68.9%	8.7	49.0%	7.9
Candelabra	80.6%	10.0	55.2%	10.0
CFL or LED capsule (A Line)	55.8%	6.9	13.5%	7.1
Other specialty bulbs	42.2%	7.4	46.9%	8.3

Percentages total to more than 100% because respondents can have multiple types of specialty bulbs.

Table 97 shows that surveyed program participants have a significantly higher percentage of efficient bulbs installed in their specialty sockets compared to non-participants (which is to be expected since participants have purchased efficient specialty bulbs through the program while non-participants have not). The largest differences are for three way bulbs (66.2% of participants' sockets are efficient versus 28.4% of non-participants) and indoor reflectors (57.5% versus 26.0%). However, participants and non-participants have more equivalent percentages of efficient bulbs installed in dimmable sockets (37.3% participants versus 39.8% non-participants) and non-participants have more efficient bulbs in the miscellaneous "other" category (22.3% versus 8.4%; most of the bulbs in this category are fluorescent tubes). Since significance tests are based on the larger sample sizes of bulbs rather than participants, all of the differences except for dimmable bulbs are significant at $p<.05$ using Student's t-test.

Table 97. Energy-Efficient Specialty Bulbs in Participant and Non-Participant Households

	Participants (N=206)		Non-Participants (N=96)	
	Total bulb count	Percent that are EE bulbs	Total bulb count	Percent that are EE bulbs
Dimmable	1,406	37.3%	435	39.8%
Three-way	411	66.2%	109	28.4%
Indoor reflector (recessed)	1,570	57.5%	281	26.0%
Outdoor reflector (recessed outdoor)	486	28.2%	115	12.2%
Globe	1,232	48.1%	369	22.8%
Candelabra	1,655	32.5%	529	11.3%
CFL or LED capsule (A Line)	790	100.0%	92	100.0%
Other specialty bulbs	642	8.4%	372	22.3%

Percentages total to more than 100% because respondents can have multiple types of specialty bulbs.

Incandescent specialty bulbs stored in participant and non-participant households are shown in Table 98. Interestingly, program participants have many more incandescent bulbs in storage than

non-participants: participants are significantly more likely to have stored incandescent specialty bulbs of every type except globes and "other" bulbs ($p<.10$ or better using Student's t-test), although the number of stored bulbs per household with stored bulbs is more similar between these groups for most categories. Overall, the 206 surveyed participants reported having 1,718 stored incandescent specialty bulbs compared to 312 stored bulbs among the 96 non-participant households, thus the average number of stored incandescent specialty bulbs per household is 8.3 for participants and only 3.3 for non-participants. This counterintuitive finding may be related to program participation: participants had just purchased an average of 16.7 specialty bulbs apiece from the program, and about 80% of these bulbs replaced incandescent ones (many of which were then stored for future use), whereas non-participants had not just purchased a large quantity of efficient program bulbs.

Table 98. Incandescent Bulbs in Storage for Future Use in Specialty Sockets

	Participants (N=206)		Non-Participants (N=96)	
	Have incandescents in storage (percent)	Bulbs per household with this type of bulb	Have incandescents in storage (percent)	Bulbs per household with this type of bulb
Dimmable	19.4%	14.2	8.3%	2.3
Three-way	19.4%	3.2	12.5%	3.4
Indoor reflector (recessed)	19.4%	5.1	9.4%	4.4
Outdoor reflector (recessed outdoor)	15.5%	2.3	7.3%	4.3
Globe	20.4%	5.0	16.7%	3.7
Candelabra	33.5%	7.4	20.8%	5.3
Other specialty bulbs	3.4%	3.6	5.2%	3.6

Percentages may total to more or less than 100% because respondents can have multiple types of bulbs in storage or none in storage.

Participant and Non-Participant Light Bulb Purchase Intentions

Table 99 shows that future light bulb purchase intentions are similar between program participants and non-participants. Among both groups, incandescent and halogen bulbs are the least popular category of bulbs accounting for only about a tenth of future bulb purchases, while CFLs will make up a solid majority of bulb purchases and LEDs will account for about a quarter. Although non-participants are slightly more likely to purchase incandescent bulbs in the future (16.6% of future purchases compared to 9.0% for participants), on the whole the purchase intention profiles of these two groups are remarkably similar.

Table 99. Purchase Intent for Next Ten Bulbs among Participants and Non-Participants

Of the Next Ten Light Bulbs You Purchase, How Many Will Be...?	All Surveyed Participants Who Answered This Question (Valid N=194)	All Surveyed Non-Participants Who Answered This Question (Valid N=91)
% who intend to buy at least one incandescent and/or halogen bulb	22.7%	22.0%
% who intend to buy at least one CFL bulb	79.4%	65.9%
% who intend to buy at least one LED bulb	43.3%	38.5%
	All Bulbs To Be Purchased (N=1,925)	**All Bulbs To Be Purchased (N=890)**
% of next ten bulbs that will be incandescent and/or halogen bulbs	9.0%	16.6%
% of next ten bulbs that will be CFL bulbs	64.2%	54.5%
% of next ten bulbs that will be LED bulbs	26.9%	28.9%

Percentages in the first three rows total to more than 100% because respondents could give multiple responses. Percentages in the bottom three rows are mutually exclusive and add up to 100%.

Though there are statistically significant differences between participants and non-participants in terms of their intentions regarding incandescent bulb purchases, on the whole these two groups are far more similar than they are different in that both show a very strong inclination towards using efficient lighting. The high interest in CFLs and LEDs among non-participants indicates that Duke Energy is targeting the households that have already adopted the new light bulb technologies; it also indicates that a lack of willingness to use these bulbs is not a barrier to program participation. However, it may also indicate that participation in this program is not transforming participants' behavior regarding efficient lighting, to the extent that targeted customers (participants and non-participants alike) have already adopted this behavior before participating in the program. Indeed, adopting the use of CFLs and LEDs is probably a prerequisite for most Savings Store customers.

Store Influence on Future CFL and LED Purchases

A majority of participants (54.9%) who visited the Store website indicate that the Store had a positive influence on the likelihood that they will buy and use CFLs in the future (Table 100). Among non-participant visitors, 41.1% reported they were more likely to use CFLs based on what they know about the program; this is a healthy percentage reporting an influence, though it is significantly lower than the rate for participants ($p<.05$ using Student's t-test).

When future LED purchases are considered the results between the two groups are almost identical: more than a third (38.3% of participants and 37.5% of non-participants) say they are more likely to purchase LEDs as a result of visiting the Store, while a majority of both groups (57.8% of participants and 55.4% of non-participants) say their experiences at the Store make them neither more nor less likely to buy LEDs in the future.

Table 100. Intention to Purchase CFLs and LEDs as a Result of Store Visits

Likelihood of future purchases as a result of Store visits	CFLs				LEDs			
	Participants (Valid N=206)		Non-Participant Visitors (Valid N=56)		Participants (Valid N=206)		Non-Participant Visitors (Valid N=56)	
	Count	Valid %	Count	Valid %	Count	Valid %	Count	Valid %
More likely	113	54.9%	23	41.1%	79	38.3%	21	37.5%
Neither more or less likely	76	36.9%	32	57.1%	119	57.8%	31	55.4%
Less likely	17	8.3%	0	1.8%	8	3.9%	3	5.4%
Don't know	0	0.0%	0	0.0%	0	0.0%	1	1.8%

When asked about their future intentions to purchase light bulbs directly from the Duke Energy Savings Store, participants were significantly more likely to do so than non-participants. In a clear example of how past behavior predicts future behavior, in total nearly two-thirds of participants (63.1%) indicated that the Savings Store would be one of the first places that they go to buy bulbs (44.7%) or that they would definitely shop at the Store again (18.4%). Among non-participants, only a quarter of visiting non-participants (26.8%) and non-visiting non-participants (25.0%) expressed equivalent levels of purchase interest. However in spite of having significantly lower interest in shopping at the Savings Store in the future relative to program participants, there are still 26.0% (25 out of 96) of non-participants who say that they are likely to shop at Savings Store the next time they need to shop for light bulbs.

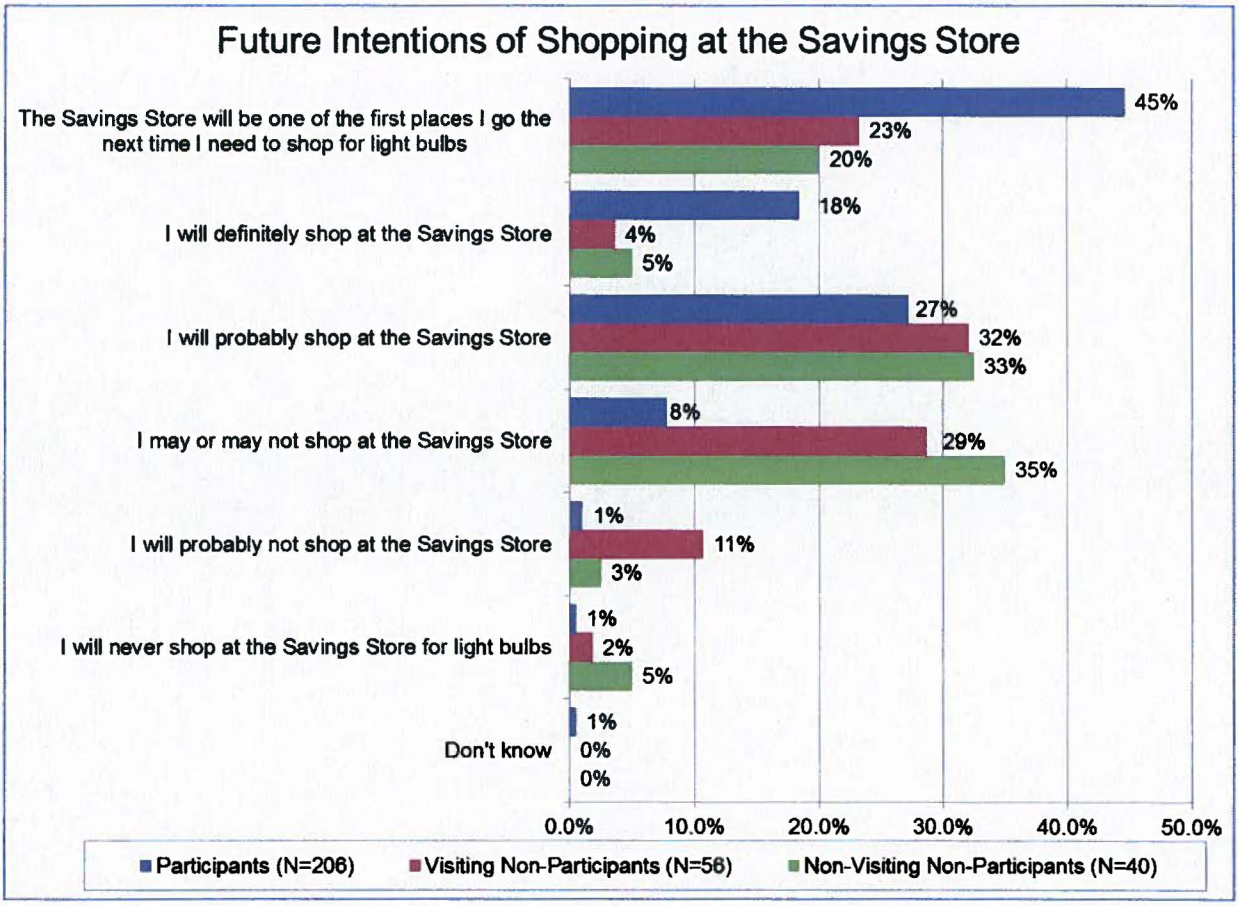

Figure 48. Future Intentions for Shopping at the Savings Store

Other Comparisons

In terms of the number of times that participants and visiting non-participants visited the Savings Store, the average number of visits was similar with 2.4 apiece among participants and 2.2 among non-participants. The median of both groups was two, although the maximum number of visits among non-participants was five while the maximum among participants was 30 site visits.

When it came to recommending the program to others, participants were more than twice as likely as non-participants to do so, with 65.0% of participants saying they had recommended the Savings Store to others, compared to just 29.2% of non-participants who said they had done so. Participants were also more prolific in recommendations, making an average of 4.6 referrals apiece compared to an average of 2.0 referrals each among non-participants. Word of mouth was the most common method of communication for both groups.

Net to Gross Analysis

Freeridership

Freeridership for this program is computed based on survey participants' responses to questions about the installation of program bulbs. An average freeridership score is calculated for each type of incented program bulb, and the final program-level freeridership is then calculated by weighting the average freeridership for each bulb type by the total number of incented program bulbs distributed in Ohio and Kentucky during the evaluation period (from program launch through June 30, 2014). Simplified versions[39] of the three participant survey questions used to calculate freeridership are listed below; this series of questions is asked once for each type of program specialty bulb a respondent has installed (if the customer installed a type of bulb in more than one location, the survey asks these questions about the installation with the largest number of program bulbs).

A. What kind of bulbs were previously in the lamps or fixtures in your [*room where program bulb installed*] where you installed the [*specialty program bulb type*] bulbs from the Savings Store?

( ) Standard Incandescent
( ) Halogen
( ) CFLs
( ) LEDs
( ) No bulbs (empty sockets)
( ) Other *(including combination of bulb types – record details)* _____
( ) DK/NS

B. If you had not known about the light bulbs available at the Savings Store, would you have continued to install [*bulbs previously in the lamps*] bulbs in this light fixture?

( ) Yes
( ) No
( ) Maybe
( ) DK/NS

If "Maybe" or "No" in question B, then ask C.

[39] The survey contains uniquely-worded versions of these questions for each category of specialty bulb. Most of these questions also include response options for dimmable versus non-dimmable bulbs, which are not shown here since dimmability is not a factor in computing freeridership. The original survey questions can be found in *Appendix C: Participant Survey Instrument*.

C. What type of bulbs would you have installed in this light fixture if you had not purchased bulbs from the Savings Store?

( ) Standard Incandescent
( ) Halogen
( ) CFLs
( ) LEDs
( ) No bulbs (would have left sockets empty)
( ) Other *(including combination of bulb types – record details)* _____
( ) DK/NS

Table 101 shows how survey responses are converted into a pair of logical statements that are used to assign freeridership scores. The two logical statements are: "the participant had efficient bulbs in these sockets before the program" and "the participant would have installed efficient bulbs in these sockets without the program." Responses to both of these statements are coded either "yes", "no" or "don't know".

Table 101. Key to Converting Survey Responses to Logical Statements

Survey questions	Survey responses[40]	Participant had efficient bulbs in these sockets before the program	Participant would have installed efficient bulbs in these sockets without the program
A. What kind of bulbs were previously in the lamps or fixtures in your [*room where program bulb installed*] where you installed the [*specialty program bulb type*] bulbs from the Savings Store?	CFL, LED	**Yes**	-
	Incandescent, Halogen	**No**	-
	No bulbs in sockets[41], Don't know, Not specified	**Don't know**	-
B. If you had not known about the light bulbs available at the Savings Store, would you have continued to install [*bulbs previously in the lamps*] bulbs in this light fixture?	Yes	-	**Yes** if efficient before program **No** if not efficient before program **Don't know** if unknown before program
	No	-	*Use response from question C*
	Maybe		**Maybe**
	Don't know, Not Specified	-	**Don't know**
C. What type of bulbs would you have installed in this light fixture if you had not purchased bulbs from the Savings Store?	CFL, LED	-	**Yes**
	Incandescent, Halogen	-	**No**
	No bulbs in sockets, Don't know, Not specified	-	**Don't know**

Table 102 shows how freeridership scores are assigned based on the responses to the two logical statements about using efficient bulbs before the program and in the absence of the program (response combinations not shown in this table are assigned freeridership of zero). A majority of surveyed specialty bulb installations (51.8% or 194 out of 394) are not considered to involve any freeridership, while 45.4% (179 out of 394) of installations received freeridership scores ranging from 50% to 100%. There were eleven installations (2.8%) which could not be scored due to

[40] Some participants gave "other" open-ended responses to these questions; these responses are coded whenever possible (for example "*an efficient bulb but I'm not sure which type*" to question A or B clearly indicates "yes" to the statements about using efficient bulbs). When "other" responses cannot be used to determine a "yes" or "no", then these responses are coded "don't know".

[41] For the purposes of calculating freeridership, "no bulbs in sockets" is considered a "don't know" response in terms of the type of bulb (efficient or not) that was installed before the program or that would be installed without the program. There are no savings from installing program bulbs in empty sockets (electricity usage actually increases), however this lack of savings is accounted for when computing kWh savings per bulb (rather than in the freeridership calculations).

survey participants giving responses categorized as "don't know" for both of the logical statements about efficient bulbs in these sockets.

Table 102. Freeridership Scores for Specialty Bulb Installations

Participant had efficient bulbs in these sockets before the program	Participant would have installed efficient bulbs in these sockets without the program	Freeridership %	Count of survey responses (N=394 specialty bulb installations)
yes	yes	100%	52[42]
yes	maybe	50%	3
don't know	yes	50%	7
no	yes	50%	117
don't know	don't know	*Withheld from calculations*	11
All other combinations of responses		0%	204

Table 103 shows the result of freeridership calculations by specialty bulb type weighted by delta watts of the surveyed installed bulbs. Delta watts data was available for 80% or 315 out of 394 installations with freeridership estimates. The remaining 79 installations were missing data from participants who did not know the wattages of their previous bulbs; these installations are assigned average replaced watts for the program bulb type installed. Overall program freeridership is the average of all bulb freeridership values weighted by the contribution of the corresponding bulb type to overall program gross kWh savings. Bulb type level freeridership estimates are presented for informational purposes only and should not be used in any calculations.

Out of 3,444 incented program bulbs confirmed shipped to surveyed participants, customers answered freeridership questions about 1,361 installed incented program bulbs (only 1,963 incented program bulbs are confirmed installed, while 1,374 incented program bulbs are stored for future use, 86 were disposed of[43], and the outcome for the remaining 21 incented bulbs could not be determined). In aggregate, about one surveyed bulb in four is categorized as a freerider bulb (22.5%), though the freeridership rate by specialty bulb type varies from a low of 13.2% for globe bulbs up to 31.1% for dimmable spiral CFLs.

[42] Five of these 52 respondents replaced a combination of efficient and incandescent bulbs; for these cases, partial freeridership scores are assigned based on the percentage of efficient bulbs replaced (i.e., if 50% of a participants' replaced bulbs were efficient then their freeridership is 50%, rather than 100%).

[43] The "disposed" bulbs category includes program bulbs that participants gave away to people in other households. Some of these bulbs may be installed in other Duke Energy households where they are providing energy savings, however this cannot be confirmed or quantified since recipients of "second-hand" program bulbs were not surveyed (i.e., we do not have any data about the installation of these bulbs, including whether or not they are installed in Duke Energy territory).

Table 103. Survey Participant Freeridership by Specialty Bulb Type

	Surveyed Bulbs Installed with Freeridership Scores	Freeridership Weighted by Delta Watts of Installations
Capsules (A Line CFLs and LEDs) (n=80)	234	22.9%
CFL Three-way Spiral (n=47)	80	28.9%
CFL Candelabra (n=64)	298	15.8%
Indoor reflectors (Recessed and Dimmable CFLs and LEDs) (n=82)	360	27.8%
CFL Globes (n=62)	271	13.2%
CFL Outdoor reflector (Recessed outdoor) (n=23)	58	17.7%
CFL Dimmable spiral (n=25)	60	31.1%
Total specialty bulbs[44] (N=383 installations)	1,361	22.5%

The previous table shows an overall freeridership rate of 22.5%; however that figure is based on the distribution of bulbs among surveyed participants. To calculate the program-level freeridership rate, freeridership scores for each bulb type are weighted according to their contribution to program gross kWh savings. Table 104 shows the weights for each bulb type and how program-level freeridership is calculated. The final program-level freeridership is thus calculated as 23.3%, which is slightly higher than the 22.5% figure based on survey results.

[44] In Table 42, the eleven installations which could not be assigned freeridership scores are withheld from the analysis (see Table 102). These eleven installations accounted for 33 installed program bulbs, thus the number of installed bulbs used for freerider calculations is 1,361 rather than 1,394.

Table 104. Weighted Overall Program Freeridership

	Freerider score by bulb type	Program records incented bulbs ordered in OH & KY (program launch through June 30, 2014)	Program Gross kWh contribution by bulb type	Program records percent kWh	Contribution to program freeridership (FR score X % bulbs sold)
Capsules (A Line CFLs and LEDs)	22.9%	34,312	791,409	21.6%	0.04949
CFL Three-way	28.9%	7,898	267,619	7.3%	0.02117
CFL Candelabra	15.8%	21,828	261,667	7.2%	0.01128
Indoor reflectors (Recessed and Dimmable CFLs and LEDs)	27.8%	43,104	1,267,325	34.7%	0.09646
CFL Globes	13.2%	25,056	358,210	9.8%	0.01292
CFL Outdoor reflector (Recessed outdoor)	17.7%	7,785	498,572	13.6%	0.02413
CFL Dimmable spiral	31.1%	5,624	211,849	5.8%	0.01803
Total specialty bulbs	*(22.5% survey-weighted average)*	145,607[45]	3,656,652	100.0%	0.23347 *(23.3% program-weighted average)*

Spillover

There are three sources contributing spillover savings for the Specialty Bulbs Program: standard spiral CFLs purchased from the Savings Store or elsewhere and purchases of additional high efficiency lighting measures from locations other than the Savings Store, but influenced, at least in part, by a participant's experience with the program.

If a survey participant purchased and installed one or more standard spiral CFLs from the Savings Store, they are asked questions about the wattage of the bulb that was replaced as well as the hours of use for that particular socket. The extent to which each respondent is a freerider with respect to standard spirals is accounted for using the diffusion of adoption curve for efficient bulbs shown in Figure 49. The resulting percentage is deducted from that participant's spillover contribution.

[45] The official total number of program bulbs sold in Kentucky and Ohio is 142,640. However, the official total does not include non-incented specialty bulb purchases. Impact calculations do include non-incented specialty bulbs thus the total bulbs distributed in Kentucky and Ohio is 145,607.

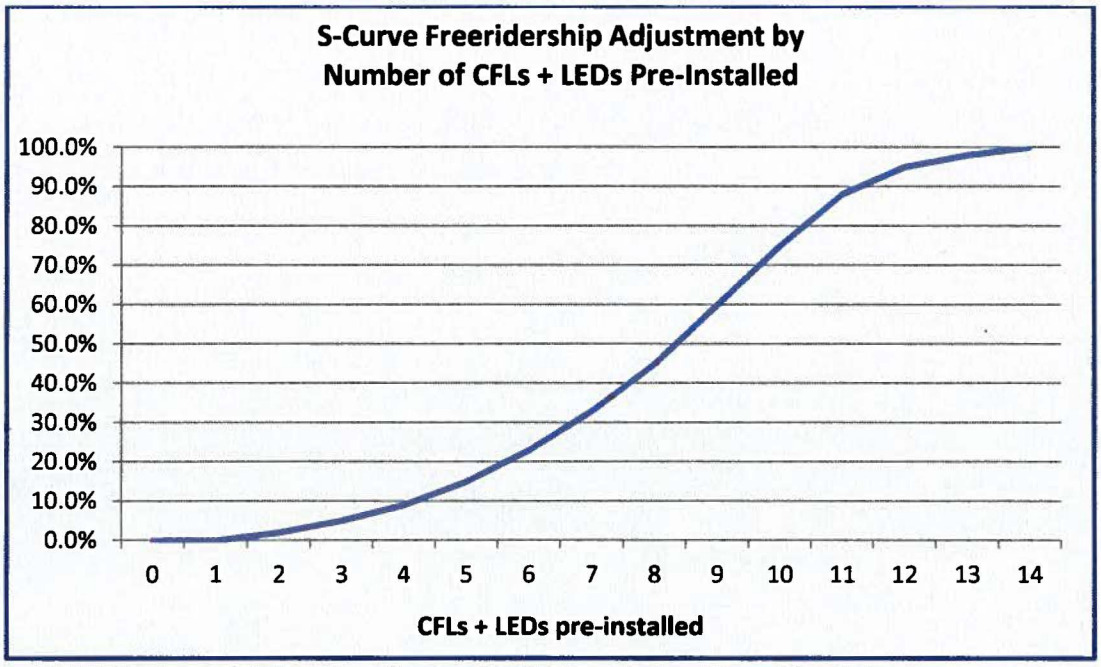

Figure 49. Diffusion of Adoption Curve for Determining Freeridership

There were six survey respondents that purchased and installed standard spiral CFLs from the Savings Store and answered the spillover question battery. Their spillover contributions were calculated using their self-reported baseline wattage and hours of use and are shown in Table 105. Together, these six participants contributed 251.64 kWh toward program spillover.

Table 105. Spillover Contribution from Non-Incented Standard Spiral CFLs Purchased through the Savings Store

Customer	Non-Incented Standard Spirals Installed	kWh	Existing EE Bulbs (Prior to Program Participation)	Freeridership	Spillover kWh
Customer 1	8	238.24	15	100%	0.00
Customer 2	2	59.56	3	5%	56.58
Customer 3	6	178.68	24	100%	0.00
Customer 4	2	59.56	0	0%	59.56
Customer 5	2	59.56	50	100%	0.00
Customer 6	5	148.90	4	9%	135.50
Total	**25**	**744.51**	**96**		**251.64**

Surveyed participants were asked how many energy efficient bulbs, if any, they had purchased elsewhere since purchasing bulbs from the Savings Store. Participants who indicated they had purchased additional energy efficient bulbs were asked how many of them they had installed. Participants were also asked to rate the influence of the program on their decision to purchase these bulbs using a 1-to-10 scale, with one signifying no program influence and ten meaning that the program was very influential. Each customer's influence rating was converted to an influence