

# State of Wisconsin Public Service Commission

Focus on Energy Evaluation

*FY08 CFL Customer Research—  
Final Report*

September 30, 2008

Evaluation Contractor: PA Consulting Group

Prepared by: Rick Winch & Tom Talerico  
Glacier Consulting Group, LLC



**focus on energy**<sup>SM</sup>

*The power is within you.*

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## TABLE OF CONTENTS

<b>1.</b>	<b>Executive Summary</b>	<b>1-1</b>
<b>2.</b>	<b>Program Overview, Research Objectives, and Methodology</b>	<b>2-1</b>
2.1	Program Overview	2-1
2.2	Research Objectives	2-2
2.3	Methodology	2-3
<b>3.</b>	<b>Awareness and Purchasing</b>	<b>3-1</b>
3.1	Awareness and Purchase Rates	3-1
3.2	Purchasing by Retail Channel	3-3
<b>4.</b>	<b>CFL Installations and Disposal</b>	<b>4-1</b>
4.1	Current Installations	4-1
4.2	Disposal Practices	4-2
<b>5.</b>	<b>Future CFL Purchasing, Installations, and Barriers</b>	<b>5-1</b>
5.1	Purchasing Intentions	5-1
5.2	Future Installations	5-2
5.3	Barriers to Future Purchasing	5-4
 <b>Appendices</b>		
	<b>APPENDIX A: Survey Instrument</b>	<b>A-1</b>
	<b>APPENDIX B: Respondent Demographics</b>	<b>B-1</b>

## 1. EXECUTIVE SUMMARY

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This report presents the results of a telephone survey designed to address customer awareness, purchase, and use of compact fluorescent lighting (CFL). The primary objective of the research is to explore how documented changes in the supply-side of the market—resulting in dramatic increases in CFL sales both in Wisconsin and nationwide—are impacting residential customer behavior and in-home installations. In particular, the study was designed to increase stakeholder understanding of:

- Consumer awareness, purchasing, and use of residential lighting products
- Where Wisconsin consumers purchase lighting products and how these purchasing patterns match the venues through which CFL program rewards are being paid
- The likelihood that consumers will buy CFLs—and continue to replace incandescent bulbs—in the future
- Barriers to future purchasing—with emphasis upon the importance of price
- The net effects of the overall retail-based CFL initiative in the residential sector.

In order to address the research objectives, a representative sample of 400 Wisconsin households were surveyed. Additionally, for the purpose of providing a comparison area (or control group), a representative sample of 400 Michigan households were surveyed. The study has a precision of  $\pm 5\%$  at the 95% confidence level. When reviewing the survey results, it is important to keep in mind that there are limitations in consumers' ability to self-report their CFL purchases and installations.<sup>1</sup> Additionally, with respect to self-reporting their future purchasing intentions, it is well understood that intentions are notoriously unreliable predictors of behavior. Given this, we think it is most appropriate to view the survey information as indicative (or suggestive) of trends, differences, and impacts rather than an absolute measure of program results.

### Awareness and Purchasing

Key findings with respect to consumer awareness and purchasing rates are:

- Both Wisconsin (95 percent) and Michigan (90 percent) consumers are highly aware of CFLs.
- While awareness rates in both states are very high, Wisconsin consumers are significantly more likely to have purchased CFLs in the past year (65 percent Wisconsin versus 55 percent Michigan). However, when they decide to purchase, consumers in both states tend to purchase about the same number—8.6 per household.
- The relatively modest gap between Wisconsin and Michigan awareness and purchase rates is most likely best explained by the tremendous growth that has been

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<sup>1</sup> This issue is more fully discussed (with appropriate references) within the *Methodology* section of this report.

observed in the regional and national CFL market over the last several years, resulting in rapid growth within Michigan and other non-program states.

- In the past year, the average Wisconsin household purchased 0.92 more CFLs than the average comparison area (i.e., Michigan) household. Taking into consideration the number of Wisconsin households, this would suggest that, in absence of the ongoing Focus initiative, roughly 1.9 million fewer CFLs would have been sold in Wisconsin in the past year.
- The bulk of all CFL purchases in Wisconsin (as well as the control area) are made either at home improvement centers or Wal-Mart/Sam's Club—underscoring the importance of finding ways to effectively work with these retailers. The need to find ways to effectively work with these retailers is particularly relevant in Wisconsin, given the fact that the home improvement channel, as documented in the *Second Annual Comprehensive CFL Market Effects Study*,<sup>2</sup> has the poorest channel level net-to-gross ratio at 0.27.

### **CFL Installations and Disposal**

Key findings with respect to current CFL installations and disposal practices are:

- Wisconsin consumers are significantly more likely to have CFLs installed—either within or outside their homes—and, when they do have CFLs installed, there are significantly more of them (77 percent of Wisconsin households currently have an average of 9.7 CFLs installed within their homes compared to 63 percent of Michigan households with an average of 8.37 CFLs installed).
- The average Wisconsin household has 41 percent more CFLs installed than the average household in the Michigan control area (a state that has not implemented any serious CFL programs in the past 10 or more years). Taking into consideration the number of Wisconsin households, one could conclude that Wisconsin currently has about 4.5 million<sup>3</sup> more CFLs installed in residential households than one might have reasonably expected to have been installed in absence of Wisconsin's CFL initiatives.<sup>4</sup> Although a crude measure of overall impacts, dividing the 4.5 million additional CFL installations by the number of CFLs incented since the inception of Focus (just over 8 million) is suggestive of a program inception-to-date net-to-gross ratio of 56 percent.

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<sup>2</sup> Rick Winch and Tom Talerico, Glacier Consulting Group. *Focus on Energy Evaluation: Second Annual Comprehensive CFL Market Effects Study*. Draft, August 22, 2008.

<sup>3</sup> This was calculated by multiplying the number of Wisconsin households by the difference in the average number of CFLs installed per household between Wisconsin and Michigan [ $2,084,544 * (7.42 - 5.27)$ ].

<sup>4</sup> As acknowledged in both Comprehensive CFL Market Effects reports, the growth in CFL sales in states and regions not formally touched by a program is undoubtedly a result of long standing efforts to promote CFLs by states such as Wisconsin and California, regional collaboratives in the Northwest and Northeast, as well as the national ENERGY STAR program. Thus, we acknowledge that it is difficult (if not impossible) to accurately assess the overall impact of the Wisconsin effort as it may have contributed to the growth we see in the Michigan control area—the very area from which we are now trying to draw comparisons for the purpose of understanding Wisconsin program impacts.

- The vast majority of Wisconsin and Michigan consumers are disposing of CFLs by throwing them in the garbage/trash. It appears that, despite their mercury content and the call for recycling, relatively few CFLs are being disposed of properly.

### Future CFL Purchasing and Installations

Key findings with respect to future CFL purchasing and installations are:

- Wisconsin and Michigan consumers, who are aware of CFLs, are highly likely to purchase them in the future (79 percent WI and 74 percent MI).
- The average Wisconsin household (Table ES-1) currently has 7.42 CFLs installed and intends to replace an average of 3.52 of their remaining incandescent bulbs. Taking into consideration that intentions are a notoriously poor measure of future behavior, this suggests that the average Wisconsin household can be expected—if present CFL opinions, attitudes, and pricing persist—to have about 22 percent of their light sockets filled with CFLs in the near term (perhaps the next 2-3 years).

**Table ES-1. Future CFL Installation Intentions**

	Average Wisconsin Household	Average Household with CFLs Currently Installed		
		All	Intend to Continue Replacing Incandescents?	
			Yes	No
Number CFLs Currently Installed	7.42	9.70	9.30	10.43
Number Incandescents to Replace <sup>1</sup>	3.52	4.59	8.21	0
<b>Total Number of CFLs Installed in Future</b>	<b>10.94</b>	<b>14.29</b>	<b>17.51</b>	<b>10.43</b>
<b>Percent of Household Sockets Impacted<sup>2</sup></b>	<b>22%</b>	<b>29%</b>	<b>35%</b>	<b>21%</b>

<sup>1</sup> The number of incandescent light bulbs respondents plan to replace with CFLs.

<sup>2</sup> Assumes 49 eligible (interior) sockets in the average household. Source: Appendix B, page B-13, Evaluation of Massachusetts ENERGY STAR® Residential Lighting Program PY2004, Volume 2 Revised April 8, 2005.

- Wisconsin consumers who currently have CFLs installed, currently have an average of 9.7 installed and intend, on average, to replace an additional 4.59 incandescents with CFLs in the future (Table ES-1). This information would suggest that, even among the group of people who currently have CFLs installed, we should not expect to see more than about 15 CFLs installed within the average household in the near-future (next two to three years). As a rough estimate, this would mean that (within the average household) CFLs would occupy about 29 percent of the sockets.
- Respondents who intend to keep replacing incandescent light bulbs (fourth column of Table ES-1) currently have an average of 9.30 CFLs installed and intend, on average, to replace an additional 8.21 CFLs. Thus, among those customers who are most favorably inclined toward CFLs (i.e., they currently have CFLs installed and intend to continue replacing existing incandescents), it is reasonable to assume, given present opinions and attitudes toward CFLs, that they will have a total of about

## 1. Executive Summary...

18 installed within the next several years, which represents about 35 percent of the total number of eligible household sockets.

- The most frequently cited reason (in both Wisconsin and Michigan) for not purchasing in the future is the feeling that CFLs cost too much. Concern about the overall “quality of lighting” is also very real in the minds of a large percentage of consumers in both states.
- Roughly three of every four consumers (in both Wisconsin and Michigan) are willing to pay \$2 for a CFL. Given this information, it seems reasonable to conclude that the major barrier to future purchasing (i.e., price) can potentially be overcome by making sure customers are aware of current CFL pricing strategies (both subsidized and unsubsidized prices). Of particular note is the fact that the current unsubsidized market price for CFLs sold in multi-packs (six or more) is already below the \$2 level.<sup>5</sup>

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<sup>5</sup> The current market price (without subsidy) of a CFL sold as part of a six-pack is \$1.68.

## 2. PROGRAM OVERVIEW, RESEARCH OBJECTIVES, AND METHODOLOGY

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This report presents the results of a telephone survey designed to address a myriad of issues around customer awareness, purchase, and use of compact fluorescent lighting. The residential evaluation team has completed a significant volume of work—most notably both FY07 and FY08 *Comprehensive CFL Market Effects Studies*<sup>6</sup>—addressing supply-side aspects of Wisconsin’s Residential Lighting Program. The supply-side research clearly indicates that significant changes are taking place in the retail-based CFL market, with CFL sales climbing dramatically (both in Wisconsin and nationwide) in the past several years. Given the significant shift in the supply-side, this research was designed to help Wisconsin stakeholders understand how these changes are impacting customers (i.e., CFL purchasers and potential purchasers), thereby providing further insight into current and possible future impacts of Wisconsin’s retail-based CFL program.

### 2.1 PROGRAM OVERVIEW

The Wisconsin ENERGY STAR<sup>®</sup> lighting program began in 1998 under the name Best Connection<sup>7</sup> and has since evolved into the Residential Lighting Program (RLP). The RLP works closely with market players such as manufacturers, distributors, and retailers to promote and market ENERGY STAR lighting products to consumers in Wisconsin. The program works with the entire manufacturing and distribution chain of ENERGY STAR lighting products in order to accelerate consumer awareness and knowledge, attract retail partners, and increase both the availability and purchase of these products. Wisconsin Energy Conservation Corporation (WECC), the program implementation contractor, provides participating retailers with the support of ENERGY STAR representatives who provide training for salespersons, labeling of products, opportunities for special events, in-store signage and banners, and point-of-purchase materials.

During calendar year 2007, over 1.4 million CFLs received rewards through the program. Sixty percent (60%) of these rewards were paid through instant—at the cash register—rewards and 23 percent were paid as retailer buydowns. The bulk of both the instant and buydown rewards are made during the annual Change-A-Light/ Change-the-World promotion, which runs from October 1 through the end of December. The remaining 17 percent were paid through a mail-in reward component. In order to receive instant and mail-in rewards, consumers are asked to fill out a reward form. Included on the form is an area to indicate if the CFLs will be used for residential, commercial, agricultural, or multifamily purposes. In 2007, 86 percent of rewards were paid for CFLs to be used for residential purposes, seven percent for commercial purposes, two percent for agricultural purposes, and five percent for multifamily purposes.

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<sup>6</sup> The two reports are: (1) Rick Winch and Tom Talerico, Glacier Consulting Group. *Focus on Energy Evaluation: Comprehensive CFL Market Effects Study—Final Report*. July 30, 2007; and (2) Rick Winch and Tom Talerico, Glacier Consulting Group. *Focus on Energy Evaluation: Second Annual Comprehensive CFL Market Effects Study—Draft Report*. August 22, 2008.

<sup>7</sup> These early efforts were implemented by Wisconsin Energy Conservation Corporation, under contract to the Focus on Energy pilot and various Wisconsin utilities.



As outlined in Table 2-1, hardware stores and home centers are the primary participants at this time (accounting for 91 percent of rewarded CFLs in 2007). With a few exceptions, grocery stores, drug stores, and mass merchandisers were relatively small players in the overall program during 2007—collectively accounting for 9 percent of paid rewards.

**Table 2-1. 2007 CFL Reward Activity  
(by retail channel)<sup>1</sup>**

	Number of Stores	Rewards Paid	% of Total
Hardware	380	475,277	34%
Home Improvement	138	796,295	57%
Grocery & Other	37	64,523	5%
Drug & Mass Merchant	15	53,018	4%
<b>Total</b>	<b>570</b>	<b>1,389,113</b>	<b>100%</b>

<sup>1</sup> Includes “instant”, “buydown”, and “mail-in” reward activity for program participants in all sectors (i.e., residential, commercial, agricultural, and multifamily) during calendar year 2007. An additional 56,242 rewards were paid to consumers who mailed in reward forms for purchases made at nonparticipating stores.

## 2.2 RESEARCH OBJECTIVES

The primary objective of this research is to explore how documented changes in the supply-side of the market—resulting in dramatic increases in CFL sales both in Wisconsin and nationwide—are impacting residential customers. In particular, the study was designed to increase stakeholder understanding of:

- Consumer awareness, use, and purchasing of residential lighting products (e.g., CFLs and incandescent light bulbs).
- Where Wisconsin consumers are currently purchasing lighting products (both incandescents and CFLs) and how these purchasing patterns match the venues through which CFL program rewards are being paid.
- The likelihood that consumers will buy CFLs (and continue to replace incandescent bulbs) in the future.
- Barriers to future purchasing—with particular emphasis upon the importance of price (and price sensitivity) in the purchasing process.
- The net effects of the overall retail-based CFL initiative in the residential sector.

Informing these objectives should enhance future program design and effectiveness. We know that the national market for CFLs is expanding rapidly and, as a result, it is important to understand whether or not paid rewards are continuing to alter consumer behavior and in-home installations in a manner that would not have been expected in absence of the Wisconsin initiative. This understanding is particularly important given the fact that CFLs have historically made up a significant portion of overall program savings, particularly in the residential sector. Any hope of documenting the long-term market effects of continued CFL promotions may, in part, hinge on the ability to not only track changes in sales, as currently done through the comprehensive CFL sales tracking system, but to also understand the resulting impacts on consumer awareness, purchasing, and household use.

### 2.3 METHODOLOGY

In order to address the research objectives, a representative sample of 400 Wisconsin households were surveyed between March 12 and May 8, 2008. Additionally, for the purpose of providing a comparison area (or control group), a representative sample of 400 Michigan households were surveyed during the same time frame. Michigan was selected as the comparison area for the following reasons: (1) demographic similarity to Wisconsin; (2) geographic similarity to Wisconsin; (3) the lack of any significant CFL programs in recent years; and (4) a Michigan presence among nearly all of the retailers participating in the Wisconsin program. An additional and very important consideration was the fact that Michigan—for the same reasons outlined above—has served, over the past two years, as the control group for the two previously referenced *Comprehensive CFL Market Effects* studies.

**Table 2-2. Survey Response Rate**

	Total	Wisconsin	Michigan
<b>Starting Sample</b>	<b>2,200</b>	<b>1,000</b>	<b>1,200</b>
No/bad phone number	242	83	159
<b>Adjusted Sample</b>	<b>1,958</b>	<b>917</b>	<b>1,041</b>
Refused	630	260	370
Unavailable for duration	17	6	11
Incapable/language barrier	29	15	14
Called out (8-11 attempts)	179	102	77
Called out (12 attempts or more)	222	53	169
Available sample	77	77	0
Complete	804	404	400
<b>Response Rate<sup>1</sup></b>	<b>41%</b>	<b>44%</b>	<b>38%</b>

<sup>1</sup> Complete ÷ Adjusted Sample

The overall study response rate, as outlined in Table 2-2, was 41 percent and has a precision of  $\pm 5\%$  at the 95% confidence level.

When reviewing the survey information presented in this report, it is important to view it within the context of what we know about the ability of consumers to accurately self-report their CFL installations and annual purchasing behaviors. We know, for example, from a 2005 Massachusetts study, that consumers have difficulty accurately reporting how many CFLs they have in their homes.<sup>8</sup> The same study also found that consumers had difficulty

<sup>8</sup> Perhaps the most comprehensive study to date (involving telephone survey self-reports followed by site-visits) found that “consumers are not able to accurately report how many CFLs they have in their homes. Only 26 percent of those visited accurately estimated how many CFLs they had in their home when asked on the telephone. A much more generous target of being within plus or minus two CFLs still found that only 60 percent of respondents were within this target. This means that 40 percent of respondents were not within plus or minus two in their estimate of how many CFLs they have in their home.” (Source: Appendix B, page B-1, Evaluation of Massachusetts ENERGY STAR<sup>®</sup> Residential Lighting Program PY2004, Volume 2 Revised April 8, 2005, Submitted by Megdal & Associates and Opinion Dynamics Corporation).

accurately self-reporting whether or not they even had CFLs in their home.<sup>9</sup> On the other hand, we know that CFL awareness is much higher today (in 2008) than it was a few years ago. And, given this development, it would seem reasonable to hypothesize that consumers are now better able to self-report their CFL purchases and installations. However, we do not know (at this time) if this hypothesis is true and, if true, to what extent the accuracy of self-reporting has improved. There may also be reason to believe that consumers can report their CFL purchases more accurately if they are asked about their more recent purchases (i.e., in the last three months) rather than annual purchases (as done within this study<sup>10</sup>). Given these issues, it is important to consider the limitations we are aware of when any conclusions are drawn from (and associated mathematics applied to) the survey information. We think it is most appropriate to view the survey information as indicative (or suggestive) of trends, differences, and impacts. And, given the limitations, one should not use the results to draw concrete conclusions about program impacts. The quantification of impacts, we believe, is better left to the FY07 and FY08 *Comprehensive CFL Market Effects* studies (previously cited) that draw upon very detailed sales data provided by retailers—both participating and nonparticipating—who sell significant volumes of CFLs in Wisconsin and Michigan.

The remainder of this report outlines the survey findings in the general order in which the survey information was collected. Section 3 outlines overall Wisconsin and control area awareness and purchasing of CFLs and other residential lighting products (primarily incandescent light bulbs), including the venues through which they are purchased. In Section 4, we explore the Wisconsin program's impact at the household level, with particular attention on the number of CFLs currently installed, the rate at which CFLs are being disposed of and, when they are discarded, how it is being done. The report concludes, in Section 5, with an analysis of study participants' willingness to buy CFLs in the future and the barriers to future purchasing, with particular emphasis on the importance of price (and price sensitivity).

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<sup>9</sup> "There had been a hypothesis that consumers might be accurate in at least knowing when they do not have any CFLs. In other words, that a telephone survey report of 'zero CFLs installed' would be accurate. This could then be used to limit necessary site visits to just those that reported having CFLs. Yet, we found that of those that reported having no CFLs, only half were accurate. The other half of these respondents did have CFLs." (Source: Appendix B, page B-1, Evaluation of Massachusetts ENERGY STAR® Residential Lighting Program PY2004, Volume 2 Revised April 8, 2005, Submitted by Megdal & Associates and Opinion Dynamics Corporation).

<sup>10</sup> It is worth noting that while asking consumers about more recent purchases (i.e., past 3-months) is likely to be more accurate, it is also considerably more expensive as it requires a considerably larger number of telephone surveys. In short, given the fluctuations in residential lighting purchases by quarter (with considerably more light bulbs being purchased in the fall/winter), a reliable quarterly purchase rate would need to be determined which would not only be a considerable expense but also take an entire year to fully complete.

**3. AWARENESS AND PURCHASING**

In this section, we present the survey results—for both Wisconsin and the Michigan control area—that address consumer awareness and purchasing of residential lighting products, both CFLs and incandescents. Particular attention is given to the venues (i.e., retail stores/channels) through which residential lighting products are purchased and whether or not these venues differ based upon the type of lighting (i.e., CFL vs. incandescent) being purchased. Of particular relevance is an attempt to understand: (1) the degree to which the retail channels through which residential lighting products are normally purchased match the venues through which CFL program rewards are being paid and (2) whether or not consumers purchase (or are likely to purchase) CFLs through multiple retail channels, including channels that they are not currently purchasing CFLs through.<sup>11</sup>

**3.1 AWARENESS AND PURCHASE RATES**

Wisconsin and Michigan consumers are highly aware of CFLs. As illustrated in Table 3-1, 95 percent of Wisconsin and 90 percent of Michigan consumers said they have heard of CFLs. While awareness rates in both states are very high, Wisconsin consumers are significantly more likely to have purchased CFLs in the past year (65 percent Wisconsin versus 55 percent Michigan). It is interesting to note, however, that the average number of CFLs purchased by consumers who purchased in the past year (regardless of which state they reside in) is about the same—8.6 per household. And, while Wisconsin has a higher annual purchase rate, the Michigan purchase rate (at 55 percent) lags Wisconsin by just 10 percentage points.

**Table 3-1. CFL Awareness and Purchase Rates**

	Wisconsin	Michigan	% Higher (WI over MI)
Aware of CFLs	95%	90%	
<b>Purchased CFL(s) in Past Year</b>			
Percent of Respondents	65%	55%	<b>18%</b>
Average Number Purchased <sup>1</sup>	8.68	8.65	
<b>Purchased CFL(s) Ever</b>			
Percent of Respondents	79%	66%	<b>20%</b>
Average Number Purchased (Per Household) <sup>2</sup>	5.63	4.71	<b>20%</b>
	<b>(n = 404)</b>	<b>(n = 400)</b>	

<sup>1</sup> Within households that purchased at least one CFL in the past year.

<sup>2</sup> Across all households (both households that did and did not purchase CFLs in the past year). Wisconsin = [(0.65 \* 404) \* 8.68]/404. Michigan = [(0.55 \* 400) \* 8.65]/400.

Table 3-2 also illustrates that the percentage of people in Michigan who have “ever” purchased CFLs lags that of Wisconsin by 13 percentage points (79 percent vs. 66 percent). Thus, Wisconsin purchasing rates (both “past year” and “ever”) are about 20 percent higher than those of Michigan. Given the fact that Michigan has not had any serious CFL

<sup>11</sup> For example, how likely is it that people who buy CFLs through hardware stores will buy them through home improvement stores should the retail-based CFL reward program be scaled back or eliminated within the hardware channel?

programming efforts in the past 10 years, one might have expected to see a larger difference between the various Wisconsin and Michigan results. The modest gap is most likely explained by the tremendous growth that has been observed in the regional and national CFL market over the last several years, resulting in rapid growth within the Michigan CFL market.

The bottom row of Table 3-1 provides the average number of CFLs purchased in the past year per Wisconsin (5.63) and Michigan (4.71) household. This means that, in the past year, the average Wisconsin household purchased 0.92 more CFLs (5.63 – 4.71) than the average comparison area (i.e., Michigan) household. If we consider the 0.92 to be the per household “lift”<sup>12</sup>, we can estimate the current year impact of the Focus effort by multiplying this by the number of Wisconsin households (2,084,544<sup>13</sup>). This would indicate that, in absence of the sustained Focus CFL initiative, roughly 1.9 million fewer CFLs would have been sold in Wisconsin in the past year. Again, in view of the previously discussed limitations in customer self-reporting, it may be best to view this as indicative of an effort that continues to provide sustainable impacts, rather than to view it as an absolute measure of impacts. It is worthy to note, for example, that the *Second Annual Comprehensive CFL Market Effects Study* (addressing the general period in which this study was completed) estimates that an additional 1.1 million CFLs sold in Wisconsin due to the Focus effort.

While noticeable differences exist between Wisconsin and Michigan consumers with respect to CFL purchasing activities, they have (as illustrated in Table 3-2) identical incandescent purchase rates—65 percent of consumers in both states indicate that they purchased incandescent light bulbs in the past year. And, as illustrated in the table, Wisconsin and Michigan consumers who purchased incandescents in the past year purchased the same number (about 10 per household). The similarity in these incandescent purchase rates—and in the number purchased—provide some confidence that the reported differences in CFL awareness and purchase rates (discussed immediately above) are, indeed, a reliable indication of relative differences between the two states.

**Table 3-2. Incandescent Purchase Rates**

	Wisconsin	Michigan
Purchased Incandescent(s) in Past Year		
Percent of Respondents	65%	65%
Average Number Purchased	10.08	9.88
	(n = 404)	(n = 400)

<sup>12</sup> “Lift” is a vernacular used in the retail world when discussing and analyzing the effectiveness of a promotion. It is the increased sales (expressed in raw number of widgets or percentage terms) that result from a promotion, be it from advertising, in-store displays, rebates, etc.

<sup>13</sup> U.S. Census Bureau, Wisconsin State and County QuickFacts, Households, 2000.

### 3.2 PURCHASING BY RETAIL CHANNEL

One of objectives of the consumer survey is to improve stakeholder understanding of the retail channels through which residential lighting products are being purchased. And, as part of this effort, to compare and contrast the venues through which CFL program rewards are being paid with the venues through which CFL and regular incandescent bulbs are being purchased. Toward this goal, Table 3-3 illustrates where Wisconsin and Michigan consumers purchased residential lighting products (both CFLs and incandescents) in the past year.

Perhaps the most important take away from Table 3-3 is the fact that about three-fourths of all CFLs purchased, in both Wisconsin and Michigan, are either purchased through Home Improvement stores or Wal-Mart/Sam's Club—underscoring the importance of finding ways to effectively work with these retailers. The need to find ways to effectively work with these retailers is particularly relevant in Wisconsin, given the fact that the home improvement channel (as documented in the previously referenced *Second Annual Comprehensive CFL Market Effects Study*) has, by far, the poorest channel level net-to-gross ratio at 0.27.

A review of Table 3-3 reveals several other interesting facts. Within both states, for example, we see fairly substantial differences between where consumers buy the bulk of their traditional residential lighting products (i.e., incandescent bulbs) and where they buy CFLs. In particular, while home improvement centers are a significant source of all residential lighting products, a considerably higher percentage of CFLs are purchased through this channel than incandescents. As illustrated in the table, 57 percent of the CFLs purchased by Wisconsin consumers in the past year were purchased through the home improvement channel, compared to just 34% of incandescents. Vice versa, while a combined 25 percent of all incandescents purchased in the past year were purchased at mass merchandisers (12 percent) or grocery stores (13 percent), only 5 percent of CFLs were purchased within these two retail channels.

**Table 3-3. Residential Lighting Purchases – by Retail Channel**

	% of CFLs Purchased			
	Wisconsin		Michigan	
	CFL	Incandescent	CFL	Incandescent
Home Improvement	57%	34%	50%	28%
Wal-Mart/Sam's Club	22%	28%	24%	15%
Mass Merchant	3%	12%	15%	30%
Hardware	11%	5%	5%	11%
Grocery	2%	13%	2%	9%
Drug	1%	3%	0%	1%
Other/Don't Know	4%	6%	5%	6%
<b>Number CFLs Purchased</b>	<b>(2,273)</b>	<b>(2,631)</b>	<b>(1,886)</b>	<b>(2,579)</b>

<sup>1</sup> Respondents were first asked to report how many CFLs they purchased in the past year, and then to report where they purchased them.

Table 3-3 also reveals that Michigan consumers are much more likely to purchase residential lighting products through the Mass Merchant category. We investigated this issue further and found that the vast majority of the Mass Merchant category sales in Michigan are taking place within a single retailer. That retailer, Meijer, has 183 stores in Michigan, Ohio, Illinois, and Kentucky. It is an interesting finding as, similar to the explosion in CFL growth that has

occurred within most (if not all) Wal-Marts, it shows the impact that a single committed regional retailer can have on fairly local CFL market.

While other, more modest, shifts can be observed in Wisconsin CFL and incandescent purchases, it is the shift between home improvement stores and mass merchants/grocery stores that is the most significant. Other interesting findings regarding the venues through which residential lighting products are purchased include:

- Drug stores appear to be an insignificant player in the residential lighting market (for both incandescents and CFLs), both in Wisconsin and in the Michigan control area
- Similar to Wisconsin, significant shifts can be observed between home improvement centers and mass merchants/grocery stores in Michigan (with CFLs significantly more likely to be purchased through home improvement centers and incandescents significantly more likely to be purchased through mass merchandisers/grocery stores).

It is also interesting to compare and contrast the retail channels through which Wisconsin consumers reported purchasing CFLs in the past year with: (1) the venues through which CFL program rewards were paid during 2007; and (2) actual retail CFL sales as estimated through the previously referenced *Second Annual Comprehensive CFL Market Effects Study*. These comparisons are presented in Table 3-4 (below). A number of interesting findings flow from this table, including:

- While the percentage of Wisconsin consumers purchasing CFLs through the home improvement channel (as estimated through this consumer survey) tracks very closely to the number of program rewards paid through that channel, the same cannot be said of hardware stores or Wal-Mart. A review of Table 3-4 indicates that, compared to customer reported CFL purchasing practices, hardware stores are much more significant players in the reward program while Wal-Mart is a virtually nonexistent player.<sup>14</sup>

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<sup>14</sup> It should be noted that Wal-Mart does not participate in the Wisconsin program. However, consumers can purchase CFLs at Wal-Mart and then submit a mail-in rebate form and, as indicated in Table 3-4, this was done by a relatively small percentage of consumers (representing two percent of all rewards paid).

- The percentage of Wisconsin consumers purchasing CFLs through the home improvement channel (as estimated through this consumer survey) is very different from the estimate derived from retailer sales data (as estimated through the *Second Annual Comprehensive CFL Market Effects Study*). In particular, the customer survey data indicates that 57 percent of CFLs were purchased through home improvement centers while the retailer sales data based estimate puts this percentage at 43 percent. Vice versa, the retailer sales data based estimate puts Wal-Mart/Sam’s Club sales at 39 percent while the customer survey data provides an estimate of 22 percent.<sup>15</sup>
- While it is difficult to reconcile the differences highlighted in the previous bullet, it is noteworthy that both the consumer based and retail based estimation methods are in agreement on one very important issue: The bulk of all CFL purchases in Wisconsin (79 percent as estimated by customer self-reports, 82 percent as estimated by retailer sales) are made either at home improvement centers or Wal-Mart/Sam’s Club. In short, all other channels combined (mass merchant, hardware, grocery, drug, other) pale in comparison to the tremendous volume of sales taking place within home improvement centers and Wal-Mart.

**Table 3-4. CFL Purchases/Rewards – by Retail Channel**

	Wisconsin: Percent of CFLs		
	Customer Reported Purchases <sup>1</sup>	Rewards Paid <sup>2</sup>	Retailer Sales <sup>3</sup>
Home Improvement	57%	55%	43%
Wal-Mart/Sam’s Club	22%	2%	39%
Mass Merchant	3%	4%	3%
Hardware	11%	33%	12%
Grocery	2%	3%	1%
Drug	1%	0%	1%
Other/Don’t Know	4%	3%	1%
<b>Number CFLs Purchased</b>	<b>(2,273)</b>	<b>(1,445,355)</b>	<b>(8,255,621)</b>

<sup>1</sup>Breakdown of customer reported CFL purchases (in past year).

<sup>2</sup>2007 CFL rewards paid (Source: Program Tracking Database).

<sup>3</sup>2007 CFL retail sales (Source: *Second Annual Comprehensive CFL Market Effects Study*).

The tremendous influence of the home improvement channel and Wal-Mart/Sam’s Club on Wisconsin CFL sales has some very interesting implications. One implication would appear to be that these high volume “players” in the CFL market will have to be paid attention to, as they very much represent where the vast majority of consumers are buying CFLs and other residential lighting products. The challenge of this implication is twofold. First, Wal-

<sup>15</sup> It is worth noting that the Retailer Sales data for Wisconsin and Michigan show nearly identical percentages of overall CFL sales being purchased through Wal-Mart. Therefore, we have no explanation for the difference between the percentages of CFLs that consumers report being purchased through Wal-Mart (22 percent) and what the retail sales data shows (39 percent). It may be that Wal-Mart shoppers, given their demographic characteristics, may be less likely to report a CFL purchase (perhaps because the purchase was more likely to be based upon impulse, they were less aware of CFLs before entering the store, etc.) but this is simply a hypothesis.



Mart/Sam's Club has, for all practical purposes<sup>16</sup>, not actively participated in the program to date. And, given their tremendous sales volumes, it is difficult to gauge whether or not a program intervention can push those sales to an even higher level. Second, the home improvement channel (the other major market player) also is a source of tremendous sales volumes and, as evidenced by the results of the *Second Annual Comprehensive CFL Market Effects Study*, the Focus program is having difficulty pushing the channel's sales volume to a higher level—the calendar year 2007 net-to-gross ratio in this channel was just 0.27, meaning that for every 100 CFLs incented through the program, the program is achieving "lift" of just 27 CFLs.

Given the information outlined in the previous paragraph, a lot of discussion has taken place, both in Wisconsin and California, as to whether or not future CFL programs should "play" with these high volume retailers (i.e., home improvement centers and Wal-Mart/Sam's Club). And, given this discussion, we thought it would be interesting to perform some extra analysis to help us understand what the implications of such a decision might be. The issues addressed and the implications from this analysis are summarized immediately below.

- If the Wisconsin program does not work with the home improvement channel and/or Wal-Mart/Sam's Club, they will be left to work with channels that have not been large sources of residential lighting products. The implication is that these "other channels" may not be able to generate the type of CFL sales needed to achieve the level of savings desired by the program. An analysis of the survey data suggests that it could be very difficult to only work with these "other" channels because only a small percentage of Wisconsin consumers who purchased CFLs through home improvement centers or Wal-Mart/Sam's Club also purchased some type of residential lighting product (CFLs or incandescents) somewhere else.<sup>17</sup>
- Alternatively, if the Wisconsin program stopped working with hardware stores (who, while despite not selling a tremendous number of CFLs outside the program, have been an important program partner), many of these customers may end up purchasing their CFLs at a home improvement store or Wal-Mart/Sam's Club. An analysis of the survey data shows that among Wisconsin consumers who purchased CFLs through hardware stores, 45 percent also purchased CFLs through another channel (primarily home improvement stores and Wal-Mart/Sam's Club). Additionally, 71 percent of these same consumers also purchased incandescents through another channel (again, primarily home improvement stores and Wal-Mart/Sam's Club).

In order to provide further insight, we performed a number of cross-tabulation for the purpose of understanding the relationship between key demographic characteristics (i.e., age, education, income, gender) and consumer awareness and purchasing. In both states, we

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<sup>16</sup> Wisconsin consumers can apply for mail-in rebates for CFLs purchased at Wal-Mart/Sam's Club, but this rarely (about one percent of the time) happens. And, while Focus has worked with Sam's Club on a few instant promotions in the past these promotions lasted less than a month and quickly expended the available funding.

<sup>17</sup> We found that only 15.7 percent of consumers who, in the last year, bought CFLs at home centers or Wal-Mart/Sam's Club also purchased CFLs through another market channel. Additionally, we found that only 30.5 percent of consumers who, in the last year, bought CFLs at home centers or Wal-Mart/Sam's Club also purchased incandescents through another market channel.

### 3. Awareness and Purchasing...



found that older respondents (those 65 or older) and younger respondents (those under 35) tend to have lower rates of CFL awareness and purchasing. We also found that higher levels of awareness and purchasing are positively correlated with higher levels of education and income. Finally, we found that male respondents tend to have higher rates of CFL awareness and purchasing than do females.

**4. CFL INSTALLATIONS AND DISPOSAL**

In this section, we explore the presence of CFLs in Wisconsin and control area (i.e., Michigan) households. We also explore the rate at which CFLs are being disposed of and, when they are discarded, how it is being done.

**4.1 CURRENT INSTALLATIONS**

Table 4-1 illustrates that Wisconsin consumers are significantly more likely to have CFLs installed—either within or outside their homes—and, when they do have CFLs installed, there are significantly more of them. The survey found 77 percent of Wisconsin households reporting that they currently have an average of 9.7 CFLs installed within their homes. This compares to 63 percent of Michigan households with CFLs installed (a 22 percent difference) with an average of 8.37 CFLs installed (a 16 percent difference).

**Table 4-1. CFL Installations**

	Wisconsin	Michigan	% Higher (WI over MI)
<b>Currently</b> have CFLs Installed			
Percent of Respondents	77%	63%	<b>22%</b>
Average Number Installed <sup>1</sup>	9.70	8.37	16%
Average Number Installed ( <b>Per Household</b> ) <sup>2</sup>	7.42	5.27	<b>41%</b>
	<b>(n = 404)</b>	<b>(n = 400)</b>	

<sup>1</sup> Within households that have at least one CFL installed.

<sup>2</sup> Across all households (both households that do and do not have CFLs installed).

The final row of Table 4-1, illustrating the average number of CFLs installed per household, is perhaps the best way to assess the overall impact (from this survey information) of the Wisconsin CFL effort thus far. The data indicates that the average Wisconsin household has 41 percent more CFLs installed than the average household in the Michigan control area (a state that has not implemented any serious CFL programs in the past 10 or more years). The 2000 U.S. Census indicates that Wisconsin has 2,084,544 households. From this, and giving consideration to the previously discussed limitations in self-reporting CFL purchases and installations, one could conclude that Wisconsin currently has about 4.5 million<sup>18</sup> more CFLs installed in residential households than one might have reasonably expected to have been installed in absence of Wisconsin’s CFL initiative.<sup>19</sup> Although it represents a fairly crude

<sup>18</sup> This was calculated by multiplying the number of Wisconsin households by the difference in the average number of CFLs installed per household between Wisconsin and Michigan [2,084,544 \* (7.42 – 5.27)].

<sup>19</sup> As acknowledged in both Comprehensive CFL Market Effects reports, the growth in CFL sales in states and regions not formally touched by a program is undoubtedly a result of long standing efforts to promote CFLs by states such as Wisconsin and California, regional collaboratives in the Northwest and Northeast, as well as the national ENERGY STAR program. Thus, we acknowledge that it is difficult (if not impossible) to accurately assess the overall impact of the Wisconsin effort as, without a doubt, it has contributed to the growth we see in the Michigan control area—the very area from which we are now trying to draw comparisons for the purpose of understanding Wisconsin program impacts.

analysis<sup>20</sup>, one can derive an inception-to-date net-to-gross ratio by dividing this 4.5 million estimate by the number of CFLs awarded through the Focus program since its inception (8,055,618 CFLs<sup>21</sup>). While a crude estimate, it is suggestive of an inception-to-date net-to-gross ratio of about 56 percent.

## 4.2 DISPOSAL PRACTICES

As discussed on the Environmental Protection Agency (EPA) website,<sup>22</sup> CFLs contain a very small amount of mercury which is sealed within the glass tubing—an average of 4 milligrams—about the amount that would cover the tip of a ballpoint pen. EPA indicates that mercury is an essential part of CFLs as it allows the bulb to be an efficient light source. Because mercury is harmful to humans, EPA recommends that consumers take full advantage of available local recycling options. And, toward this end, EPA is beginning to work with CFL manufacturers and major U.S. retailers to expand recycling and disposal options.

Table 4-2 indicates that 20 percent of Wisconsin and 13 percent of Michigan consumers have disposed of CFLs in the past year. As indicated in the table, the vast majority of consumers in both states are disposing of the bulbs by throwing them in the garbage/trash. The only significant difference in the table is the fact that a higher percentage of Wisconsin households disposing of CFLs did so by putting them in their recycling bin (13 percent in Wisconsin vs. 2 percent in Michigan). If CFLs disposed of through recycling bins are being broken—when being dumped from a recycling bin into a recycling truck and then, again, dumped at the recycling plant—or are still entering the “trash” stream at the recycling center, this may not be the best outcome.

**Table 4-2. CFL Disposal Rates and Methods**

	% of Respondents	
	Wisconsin	Michigan
<b>Disposed</b> of CFLs in Past Year	20%	13%
	<b>(n = 404)</b>	<b>(n = 400)</b>
<b>Method of Disposal</b>		
Garbage/Trash	72%	76%
Recycling Bin	13%	2%
Recycled – specific program	10%	13%
Storing	0%	2%
Don't Know	5%	7%
	<b>(n = 81)</b>	<b>(n = 53)</b>

In order to provide further insight, we performed a number of cross-tabulations for the purpose of understanding the relationship between key demographic characteristics (i.e., age, education, income, gender) and consumer installation and disposal practices. In both states, we found that older respondents (those 65 or older) and younger respondents (those under

<sup>20</sup> A more refined method would attempt to do some level of subtracting from and adding to this estimate by taking other, albeit less critical, factors into consideration such as CFL burnouts, CFLs removed for other reasons, CFLs in-storage awaiting installation, etc.

<sup>21</sup> Total number of Focus CFL rewards paid between June 1, 2001, and June 30, 2008.

<sup>22</sup> [http://www.energystar.gov/ia/partners/promotions/change\\_light/downloads/Fact\\_Sheet\\_Mercury.pdf](http://www.energystar.gov/ia/partners/promotions/change_light/downloads/Fact_Sheet_Mercury.pdf)

35) tend to have lower rates of CFL installation. We also found that higher installation rates are positively correlated with higher levels of education and income.

**5. FUTURE CFL PURCHASING, INSTALLATIONS, AND BARRIERS**

A key aspect of the survey was to gain insight into the willingness of consumers to purchase CFLs in the future, with particular attention toward gauging the extent to which consumers are thinking about replacing currently installed incandescent light bulbs with CFLs. As part of the measurement process, consumers were also asked about the barriers to future CFL purchasing, with emphasis on understanding the importance of price (and price sensitivity) in the purchasing process.

**5.1 PURCHASING INTENTIONS**

As indicated in Table 5-1, the vast majority of both Wisconsin and Michigan consumers, who are aware of CFLs, said they are either “very” or “somewhat” likely to buy them in the future (79 percent WI and 74 percent MI). It is interesting to note that about one of every five consumers in both states, said they are “somewhat” or “very” unlikely to buy them.

**Table 5-1. Future CFL Purchasing Intentions**

	% of Respondents	
	Wisconsin	Michigan
<b>Likelihood of Purchasing CFLs in Future<sup>1</sup></b>		
Very Likely	53%	48%
Somewhat Likely	26%	26%
Neither Likely nor Unlikely	2%	3%
Somewhat Unlikely	8%	9%
Very Unlikely	10%	11%
Don't Know/Not Sure	1%	3%
	<b>(n = 382)</b>	<b>(n = 359)</b>

<sup>1</sup> Only respondents who were “aware” of CFLs were asked this question.

Not surprisingly, we found that Wisconsin and Michigan consumers who currently have CFLs installed to be significantly more likely to be “very” or “somewhat” likely to purchase additional CFLs in the future. In all, 88 percent of Wisconsin and 84 percent of Michigan consumers who currently have CFLs installed are likely to purchase more in the future. Alternatively, among consumers who do not currently have CFLs installed, about 43 percent of Wisconsin and 50 percent of Michigan consumers are likely to purchase CFLs in the future.<sup>23</sup>

Within the survey, respondents who (1) already had at least one CFL installed and (2) were “very” or “somewhat” likely to purchase CFLs in the future, were asked if they still have incandescent light bulbs—installed either within or outside their home—that they plan on

<sup>23</sup> At first glance, it might appear odd that Michigan consumers, who do not currently have CFLs installed, are more likely to buy CFLs in the future (as compared to the same Wisconsin group). However, this is likely a function of the fact that the pool of Wisconsin consumers in this category is smaller and, therefore, comprised of a more hard core set of late adopters.

replacing with CFLs.<sup>24</sup> We found that just over 60 percent of both Wisconsin and Michigan respondents within this group answered “yes.” And, the average respondent (in both states) said they think they will eventually replace about eight more incandescents. This information is more fully developed and discussed in the next subsection.

## 5.2 FUTURE INSTALLATIONS

In this subsection, we bring together a number of previously discussed results for the purpose of projecting what Wisconsin households might look like (with respect to CFL installations) in the near future. In particular, for the typical Wisconsin household, we bring together information (originally discussed in Section 4) with respect to the number of CFLs currently installed with information (originally discussed in the previous subsection, 5.1) with respect to intentions to continue replacing incandescent light bulbs.

Prior to presenting this information, it is important to note some rather significant provisos. First, intentions are notoriously unreliable predictors of behavior, and in this particular case there is the additional issue that only near-term intentions may be being captured (i.e., respondents, in answering the “intentions” question, probably were not guessing at what their behavior will be more than a couple years from now). Second, incandescent light bulbs (at least the current versions of them) will start being phased out by law in 2012. Finally, studies in New England have found current CFL saturation up to 24 percent and rapidly climbing, with the vast majority of remaining incandescents being decent candidates for replacement with CFLs. While Wisconsin is not New England, there seems to be no reason to assume that Wisconsin households cannot reach similar levels of saturation.

Despite the very real limitations to the line of questioning, a synthesis of the information pertinent to future installations is outlined in Table 5-2. As illustrated in the table, the average Wisconsin household currently has 7.42 CFLs installed and intends to replace an average of 3.52 of their remaining incandescent bulbs. Giving full consideration to consumers’ limitations in reporting future behavior, this suggests that the average Wisconsin household can be expected to have 10.94 CFLs installed in the near future (i.e., within the next two to three years). This represents about 22 percent of the light sockets within a typical home—implying that 78 percent of sockets would continue to be filled with regular (incandescent) light bulbs.

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<sup>24</sup> The question was framed to address respondents’ intentions to continue replacing existing incandescent light bulbs (rather than replacing currently installed CFLs, upon burn out, with other CFLs) in order to gain insight into the total number of sockets within a home that might be reasonably expected, in the near future, to be filled with CFLs. The results of this line of questioning are more fully explored in the next subsection (5-2).

**Table 5-2. Future CFL Installation Intentions**

	Average Wisconsin Household	Average Household with CFLs Currently Installed		
		All	Intend to Continue Replacing Incandescents?	
			Yes	No
Number CFLs Currently Installed	7.42	9.70	9.30	10.43
Number Incandescents to Replace <sup>1</sup>	3.52	4.59	8.21	0
<b>Total Number of CFLs Installed in Future</b>	<b>10.94</b>	<b>14.29</b>	<b>17.51</b>	<b>10.43</b>
<b>Percent of Household Sockets Impacted<sup>2</sup></b>	<b>22%</b>	<b>29%</b>	<b>35%</b>	<b>21%</b>

<sup>1</sup> The number of incandescent light bulbs respondents plan to replace with CFLs.

<sup>2</sup> Assumes 49 eligible (interior) sockets in the average household. Source: Appendix B, page B-13, Evaluation of Massachusetts ENERGY STAR<sup>®</sup> Residential Lighting Program PY2004, Volume 2 Revised April 8, 2005.

The final three columns of Table 5-2 take the analysis and synthesis pertinent to future CFL installation intentions to a more detailed (and perhaps more interesting) level. The last three columns explore current CFL installation practices, and future incandescent replacement intentions, among those households that currently have CFLs installed. The analysis, by concentrating on consumers who appear to be more open to (or supportive of) CFLs, is intended to provide some insight into what a slightly longer-term future installation scenario might look like.

As indicated in Table 5-2, respondents who currently have CFLs installed, currently have an average of 9.7 installed and intend, on average, to replace an additional 4.59 incandescents with CFLs in the future (for a total number installed of 14.29). This information would suggest that, even among the group of people who currently have CFLs installed, we should not expect to see more than about 15 CFLs installed within the average household in the near-future (next 2-3 years). As a rough estimate, this would mean that (within the average household) CFLs would occupy about 29 percent of the sockets.

To take the analysis one step further, we separated respondents who currently have CFLs installed into those who intend to (and those who do not intend to) replace more of their incandescent lighting with CFLs. Respondents who intend to keep replacing incandescent light bulbs, currently have an average of 9.30 CFLs installed and intend, on average, to replace an additional 8.21 CFLs (bringing the total number of future CFL installations to 17.51)<sup>25</sup>. Thus, among those customers who are most favorably inclined toward CFLs (i.e.,

<sup>25</sup> It is interesting to note that, as part of the analysis process, we isolated customers who said they do not intend to continue replacing incandescents with CFLs because all of their fixtures currently have CFLs (or at least all of the fixtures they ever intend to replace currently have CFLs). We found that these customers had an average of 17 CFLs installed, a figure strikingly similar to the 17.51 arrived at through the methodology employed in Table 5-2.



they currently have CFLs installed and intend to continue replacing existing incandescents), it is reasonable to assume, given present opinions and attitudes toward CFLs, that they will have a total of about 18 installed within in the next several years, which represents about 35 percent of the total number of eligible household sockets.

### 5.3 BARRIERS TO FUTURE PURCHASING

Respondents who said they were “neither likely nor unlikely,” “somewhat unlikely,” or “very unlikely” to install CFLs in the future, were asked to explain why. As illustrated in Table 5-3, the most frequently cited reason (in both Wisconsin and Michigan) for not purchasing in the future is the feeling that CFLs cost too much. In both states, this was closely followed by a dislike of the light quality/color and the feeling that CFLs were not safe or hard to dispose of, given the fact that they contain mercury. It is interesting to note that the feeling that CFLs are “not bright enough or too dim” also made the top four reasons as this, combined with the number of people who commented on light quality/color, is a strong indication that the overall “quality of lighting” issue is still very real in the minds of a large percentage of consumers in both states.

**Table 5-3. Why CFLs Unlikely to be Purchased in Future<sup>1</sup>**

	% of Respondents	
	Wisconsin <sup>2</sup>	Michigan <sup>2</sup>
Cost too much/too expensive	25%	22%
Poor light quality/color	21%	15%
Not Safe (Mercury)/Hard to Dispose	21%	22%
Not bright enough/too dim	13%	17%
Don't fit my fixtures	7%	9%
Already have enough	6%	5%
Slow to startup/Slow to brighten	4%	5%
Don't see energy/bill savings	4%	4%
Satisfied with current lighting	4%	9%
Don't know/Not sure	4%	5%
Burn out quickly/don't last	3%	5%
Light flickers/buzzing sound	1%	5%
Habit (convenience) not interested	3%	7%
Can't get the kind I want	0%	6%
	<b>(n = 73)</b>	<b>(n = 81)</b>

<sup>1</sup> Only respondents who were “aware” of CFLs but “neither likely nor unlikely,” “somewhat unlikely,” or “very unlikely” to purchase them in the future were asked this question.

<sup>2</sup> Responses total to more than 100% because respondents were permitted to give more than one reason. Only those responses given by more than 4% of either Wisconsin or Michigan respondents are presented.

As outlined in Table 5-3, the single biggest barrier to purchasing CFLs (mentioned by roughly one of every four respondents in both states) is the perception that CFLs are too expensive. Anticipating this outcome, the survey included an assessment of survey participants’ willingness to pay for CFLs at various prices (see Table 5-4). As discussed in both the FY07 and FY08 Comprehensive CFL Market Effects reports (previously cited), the long-term market price for a 60-watt soft white spiral (the most frequently rewarded CFL) would appear to be around \$1.50. Given this, and as illustrated in Table 5-4, it would appear that roughly three of every four Wisconsin (and Michigan) households would be willing to pay that price. A quick

review of the table indicates that \$2 would appear to be the tipping point as the amount needed to spur the interest of the majority of consumers as 77 percent of Wisconsin consumers (72 percent of Michigan) said they are willing to pay that amount for a CFL.

It is interesting to see that price reductions below \$2 per CFL have a decreasing effect on getting more customers to purchase. For example, going from \$3 to \$2 increases the willingness to pay among Wisconsin consumers by 14 percentage points (63 percent to 77 percent), while going from \$2 to \$1 increases willingness to pay by only six percentage points (77 percent to 83 percent). Perhaps even more interesting is the fact that the \$2 selling price is one dollar higher than the retail price of many CFLs during the Change-A-Light/ Change-the-World campaign.<sup>26</sup> From the table, it seems reasonable to conclude that many of the barriers to future purchasing (as outlined in the previous table) can potentially be overcome by simply making sure customers are aware of current CFL pricing strategies (both subsidized and unsubsidized prices). Of particular note is the fact, as outlined in both the FY07 and FY08 *Comprehensive CFL Market Effects* studies, that the current unsubsidized market price for CFLs sold in multi-packs (6 or more) is already below the \$2 level.<sup>27</sup>

**Table 5-4. Willingness-to-Pay for CFLs**

	% of Respondents	
	Wisconsin	Michigan
Willing to pay ___ for CFL?		
5 dollars	30%	31%
4 dollars	40%	37%
3 dollars	63%	60%
2 dollars	77%	72%
1 dollar	83%	78%
50 cents	85%	80%
	<b>(n = 404)</b>	<b>(n = 400)</b>

In order to provide further insight, we performed a number of cross-tabulation for the purpose of understanding the relationship between key demographic characteristics (i.e., age, education, income, gender) and future CFL purchasing and installation intentions. In both states, we found that older respondents (those 65 or older) and younger respondents (those under 35) tend to be less likely to indicate that they plan to purchase and install CFLs in the future. We also found that purchasing and installation intentions are positively correlated with higher levels of education and income. Finally, we found that male respondents and female respondents tend to be equally willing to purchase and install CFLs in the future.

<sup>26</sup> WECC's floor price for a CFL for "instant" and "buydown" campaigns, is \$0.975 per bulb. Many home center participants do lower the after reward price to this level.

<sup>27</sup> The current market price (without subsidy) of a CFL sold as part of a six-pack is \$1.68.

## **FY08 CFL Customer Survey**

**Draft #7 (March 14, 2008)**

Note: Interviewers should NOT read words in parenthesis ( )

**[Programming: Set the following variables to zero]**

**AWARE = Aware of CFLs?**

**PLASTYR = Purchased CFLs in last year?**

**PEVER = Ever purchased CFLs?**

**CINSTALL = Currently have CFLs installed either within or outside home?**

**LOWES = ever purchased at Lowes?**

**HOME = ever purchased at Home Depot?**

**MENARDS = ever purchased at Menards?**

**SAMS = ever purchased at Sam's Club?**

**WALMART = ever purchased at Wal-Mart?**

### **Introduction:**

**Programming Note: use Wisconsin or Michigan based on the sample being called**

Hello, my name is \_\_\_\_\_ from PA Consulting. We are working on a study of the type of lighting used by **Wisconsin/Michigan** homeowners. I'm not selling anything. I would like to speak with the person most familiar with the light bulbs purchased for your home. Would that be you?

Yes

No → May I speak with that person? Repeat introduction if necessary.

(IF ASKED) This will take just a few minutes.

**Read:** In this survey, I will be asking you about two different kinds of light bulbs. One type is called an incandescent light bulb. This type of light bulb has been around for well over 100 years and is the type of light bulb many of us grew up using.

The other light bulbs we will be talking about are compact fluorescent light bulbs. They are often made of thin tubes of glass bent into spiral loops and screw into normal light sockets. They have become more available over the last 10 years as an energy-efficient, long-lasting substitute for regular incandescent light bulbs. Before a rebate or

other promotional offering, compact fluorescents tend to cost 2 to 8 dollars more than regular incandescent bulbs.

**Section 1: CFL Awareness, Purchasing, Installation**

C1. I want to begin by talking about compact fluorescent light bulbs. Before today, had you ever heard of compact fluorescent light bulbs? [RECORD ONE RESPONSE]

- 1 Yes
- 2 No -----> (Skip to Section 2)
- 8 (Don't know/Not sure) -----> (Skip to Section 2)

**[Programming: If yes, set variable AWARE = 1]**

C2. In the past 12 months, have you or anyone else in your household purchased any compact fluorescent light bulbs for this residence? [RECORD ONE RESPONSE]

- 1 Yes
- 2 No
- 8 (Don't know)

**[Programming: If yes, set variable PLASTYR = 1 and PEVER = 1]**

**[Programming Note: Do NOT ask if C2 = 1]**

C3. Have you or anyone in your household **EVER** purchased any compact fluorescent light bulbs for this residence? [RECORD ONE RESPONSE]

- 1 Yes
- 2 No
- 8 (Don't know)

**[Programming: If yes, set variable PEVER = 1]**

**Purchased CFLs in past 12 months**

**[Programming: Ask if PLASTYR = 1]**

C4. Approximately how many compact fluorescents have been purchased for this residence in the past 12 months? [RECORD NUMBER]

- \_\_\_\_\_ (Number compact fluorescents - purchased past 12 months)
- 9998 (Don't Know)
- 9999 (Refused)

**[Programming: Ask if PLASTYR = 1]**

C5. At what stores were these compact fluorescent bulbs purchased? [DO NOT READ LIST; RECORD NAME OF STORE(S)]

- 1. (Lowe's) **[Programming Note: If selected, set LOWES = 1]**
- 2. (Home Depot) **[Programming Note: If selected, set HOME = 1]**
- 3. (Menards) **[Programming Note: If selected, set MENARDS = 1]**
- 4. (Sam's Club) **[Programming Note: If selected, set SAMS = 1]**
- 5. (Wal-Mart) **[Programming Note: If selected, set WALMART = 1]**
- 6. (Other; Record SPECIFIC name of stores)

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**Have Purchased CFLs (just not in last 12 months)**

**[Programming Note: Ask if PLASTYR = 0 and PEVER = 1]**

C6. When your household purchased compact fluorescent bulbs in the past, at what stores were they purchased? [DO NOT READ LIST; RECORD NAME OF STORE(S)]

- 1. (Lowe's) **[Programming Note: If selected, set LOWES = 1]**
- 2. (Home Depot) **[Programming Note: If selected, set HOME = 1]**
- 3. (Menards) **[Programming Note: If selected, set MENARDS = 1]**
- 4. (Sam's Club) **[Programming Note: If selected, set SAMS = 1]**
- 5. (Wal-Mart) **[Programming Note: If selected, set WALMART = 1]**
- 6. (Other; Record SPECIFIC name of stores)

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**[Programming Note: Ask if PLASTYR = 1 or PEVER = 1]**

C7. Are you the person who buys most of the compact fluorescent light bulbs for your household? [RECORD ONE RESPONSE]

- 1 Yes
- 2 No
- 8 (Don't know/Not Sure)

**Currently have CFLs Installed**

**[Programming: Ask if AWARE = 1]**

C8. Do you currently have any compact fluorescent light bulbs installed either within or outside your home? [RECORD ONE RESPONSE]

- 1 Yes
- 2 No -----> (Skip to C10)
- 8 (Don't know/Not Sure) -----> (Skip to C10)

**[Programming: If yes, set CINSTALL = 1]**

C9. Approximately how many compact fluorescent light bulbs are currently installed either within or outside your home? [RECORD NUMBER]

- \_\_\_\_\_ (Number of compact fluorescents - currently installed)
- 9998 (Don't Know)
- 9999 (Refused)

**[Programming: Ask if AWARE = 1]**

C10. Have you disposed of any compact fluorescent light bulbs in the past 12 months? [RECORD ONE RESPONSE]

- 1 Yes
- 2 No -----> (Skip to Section 2)
- 8 (Don't know/Not Sure) -----> (Skip to Section 2)

C11. How did you dispose of them? [RECORD VERBATIM]

\_\_\_\_\_

(Prompt: What did you do with them?)

**If respondent asks: What should I do with them? Answer:** Compact fluorescent light bulbs contain a very small amount of mercury sealed within the glass tubing. The Environmental Protection Agency (EPA) recommends that consumers take advantage of available recycling options offered by manufacturers and retailers. ([http://www.energystar.gov/ia/partners/promotions/change\\_light/downloads/Fact\\_Sheet\\_Mercury.pdf](http://www.energystar.gov/ia/partners/promotions/change_light/downloads/Fact_Sheet_Mercury.pdf))

**Section 2: Regular (Incandescent) Purchasing**

Read: Now I want to talk about regular incandescent light bulbs. As I said before, this is the type of light bulb that has been around for well over 100 years and is the type of light bulb many of us grew up using.

I1. In the past 12 months, have you or anyone else in your household purchased any regular incandescent light bulbs for this residence? [RECORD ONE RESPONSE]

- 1 Yes
- 2 No -----→ (Skip to I4)
- 8 (Don't know) -----→ (Skip to I4)

I2. Approximately how many regular incandescent light bulbs have been purchased for this residence in the past 12 months? [RECORD NUMBER]

- \_\_\_\_\_ (Number incandescents - purchased past 12 months)
- 9998 (Don't Know)
- 9999 (Refused)

I3. At what stores were these incandescent bulbs purchased? [DO NOT READ LIST; RECORD NAME OF STORE(S)]

- 1. (Lowe's) **[Programming Note: If selected, set LOWES = 1]**
- 2. (Home Depot) **[Programming Note: If selected, set HOME = 1]**
- 3. (Menards) **[Programming Note: If selected, set MENARDS = 1]**
- 4. (Sam's Club) **[Programming Note: If selected, set SAMS = 1]**
- 5. (Wal-Mart) **[Programming Note: If selected, set WALMART = 1]**
- 6. (Other; Record SPECIFIC name of stores)

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**[Programming Note: All respondents to I3 should skip to Section 3]**

14. When your household purchases regular incandescent light bulbs, at what stores are they purchased? [DO NOT READ LIST; RECORD NAME OF STORE(S)]

1. (Lowes) [Programming Note: If selected, set LOWES = 1]
2. (Home Depot) [Programming Note: If selected, set HOME = 1]
3. (Menards) [Programming Note: If selected, set MENARDS = 1]
4. (Sam’s Club) [Programming Note: If selected, set SAMS = 1]
5. (Wal-Mart) [Programming Note: If selected, set WALMART = 1]
6. (Other; Record SPECIFIC name of stores)

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**Section 3: Likelihood of Future CFL purchase (among all those aware)**

**[Programming: ask this Section if AWARE = 1]**

F1. In the future, how likely are you to buy compact fluorescent light bulbs? Would you say you are... [READ LIST, RECORD ONE RESPONSE]

- 1 Very Likely to purchase -----→ (Skip to F3)
- 2 Somewhat Likely to purchase -----→ (Skip to F3)
- 3 Neither likely nor unlikely to purchase
- 4 Somewhat Unlikely to purchase
- 5 Very Unlikely to purchase
- 98 (Don’t know/Not Sure) -----→ (Skip to F4)

**[Programming Note: Fill in blank within Question F2 with the following:]**

**If F1 = 3 – “neither likely nor unlikely”**

**If F1 = 4 – “somewhat unlikely”**

**If F1 = 5 – “very unlikely”**

F2. Why are you \_\_\_\_\_ to buy compact fluorescent bulbs in the future? [RECORD ALL THAT APPLY]

- 1 (Not bright enough/too dim)
- 2 (Slow to start-up/Take too long to come to full brightness)
- 3 (Poor light quality/color)
- 4 (Burn out too quickly/ Don’t last)
- 5 (Unattractive/Ugly/Don’t like how they look)
- 6 (Don’t see the energy savings/bill savings)
- 7 (Cost too much/Too expensive)
- 8 (Light flickers/Buzzing sound)



- 9 (Don't fit my fixtures)
- 10 (Satisfied with current lighting)
- 11 (Other, specify: \_\_\_\_\_)
- 98 (Don't Know/Not Sure)

**[Programming Note: Ask if (F1 = 1 or 2) and CINSTALL = 1]**

F3. Are there still incandescent light bulbs installed either within or outside your home that you plan to replace with compact fluorescent bulbs? [RECORD ONE RESPONSE]

- 1 Yes -----> How many of these incandescents do you think you will eventually replace?

\_\_\_\_\_ (record verbatim)

- 2 No -----> Why won't you be replacing more incandescents with compact fluorescents? \_\_\_\_\_

(record verbatim)

- 8 (Don't know)

**[Programming Note: Fill in blank within Question F4 with the following, continue asking the question with the lower amount until a "Yes" answer is given (starting at \$5, as soon as a "Yes" answer is given the respondent can move to Section 4)]**

**"5 dollars" – capture response to \$5 prompt, in variable named F5DOLLAR**

**"4 dollars" – capture response to \$4 prompt, in variable named F4DOLLAR**

**"3 dollars"– capture response to \$3 prompt, in variable named F3DOLLAR**

**"2 dollars"– capture response to \$2 prompt, in variable named F2DOLLAR**

**"1 dollar"– capture response to \$1 prompt, in variable named F1DOLLAR**

**"50 cents"– capture response to 50 cents prompt, in variable named F50CENTS**

F4. Would you be willing to pay \_\_\_\_\_ for a single compact fluorescent light bulb? [READ LIST, RECORD ONE RESPONSE]

- 1 Yes -----> (Skip to Section 4)
- 2 No
- 8 (Don't know)

**Section 4: Ever Shop at Stores that have CFLs?**

[Programming Note: Fill in blank within Question E1 with the following stores, only ask about a given store if the associated variable = 0]

“Lowe’s” [ask if LOWES = 0] – capture E1 response in ELOWES

“Home Depot” [ask if HOME = 0] – capture E1 response in EHOME

“Menards” [ask if MENARDS = 0] – capture E1 response in EMENARDS

“Sam’s Club” [ask if SAMS = 0] – capture E1 response in ESAMS

“Wal-Mart” [ask if WALMART = 0] – capture E1 response in EWALMART

E1. I am going to read a list of stores and would like you to tell me if you ever shop at that store.

Do you ever shop at \_\_\_\_\_? (RECORD ONE RESPONSE)

- 1 Yes
- 2 No
- 8 (Don’t know)

**Section 5: Demographics**

D1. In what year were you born? [RECORD YEAR]

\_\_\_\_\_ (Year of birth)

- 98 (Don’t Know/Not Sure)
- 99 (Refused)

D2. What is the highest level of education you have had the opportunity to complete? [READ LIST, RECORD ONE NUMBER]

- 1 Some high school
- 2 High school graduate
- 3 Some technical school or college
- 4 Technical school graduate (associates degree)
- 5 College graduate (bachelors degree)
- 6 Advanced degree (masters degree or higher)
- 7 (Other: Specify \_\_\_\_\_)
- 99 (Refused)

D3. Which of the following income categories best describes your total annual household income in 2007, before taxes? Please stop me when I get to the right category. [READ LIST, RECORD ONE NUMBER]

- 1 Less than \$30,000
- 2 \$30,000 - \$49,999
- 3 \$50,000 - \$74,999
- 4 \$75,000 - \$ 99,999
- 5 \$100,000 or more
- 98 (Don't know/Not Sure)
- 99 (Confidential/Refused to Answer)

D4. [RECORD GENDER – DO NOT ASK]

- 1 (Male)
- 2 (Female)

COMMENTS\*\*

[INTERVIEWER READ: Those are all the questions I have. Thank you for your help on this very important research study.]

**APPENDIX B: RESPONDENT DEMOGRAPHICS**

The survey concluded with a limited set of demographic questions. The overall responses to each of the questions are outlined below. In summary, survey respondents tend to be older, more highly educated, and more affluent than Wisconsin’s overall residential population. A number of cross-tabulations were performed to look for potential relationships between key survey questions and these demographic characteristics. Meaningful results from the cross-tabulations are also outlined below.

**B.1 DEMOGRAPHIC CHARACTERISTICS**

The results from each of the four demographic questions that were included in the survey are outlined below. Noteworthy findings from each of the questions immediately follow each of the tables. Because the demographic characteristics of survey respondents (in both Wisconsin and Michigan) differ from U.S. Census data, we explored the impact this might have on the survey results reported on throughout all sections of this report (by weighting the survey results for both Wisconsin and Michigan—by age, education, income, and gender—to match the U.S. Census data). In particular, we took a thorough look at the relationship between each of the demographic variables and the key survey questions related to customer awareness and purchasing. We found that weighting both Wisconsin and Michigan survey information (to match U.S. Census data) did not significantly impact the survey results, including the measured differences we found between respondents in each state. In other words, both the weighted results and unweighted results (provided throughout this report) do not significantly differ from one another.

**Table B-1. Age of Respondents**

Years	% of Respondents		
	Wisconsin <sup>1</sup>	Michigan <sup>1</sup>	Census <sup>2</sup>
Under 35	10%	7%	49%
35 to 54	41%	39%	30%
55 to 64	24%	24%	8%
65 and over	25%	30%	13%
	<b>(n = 372)</b>	<b>(n = 366)</b>	

<sup>1</sup>Does not include customers who refused to answer the question.

<sup>2</sup>Source: U.S. Census Bureau. DP-1 Profile of General Demographics Characteristics: 2000. Dataset: Census 2000 Summary File 1 (SF 1) 100-percent Data. Geographic Area: Wisconsin. (Total housing units).

- Compared to Wisconsin’s residential population (U.S. Census Bureau), survey respondents are more likely to be 55+ years old.

**Table B-2. Education Levels**

	% of Respondents		
	Wisconsin	Michigan	Census <sup>1</sup>
High School or Less	31%	31%	50%
Some Technical School/College	31%	29%	28%
College Graduate	35%	36%	22%
Refused	3%	4%	
	<b>(n = 404)</b>	<b>(n = 400)</b>	

<sup>1</sup>Source: U.S. Census Bureau. DP-2 Profile of Selected Social Characteristics: 2000. Dataset: Census 2000 Summary File 3 (SF 3) Sample Data. Geographic Area: Wisconsin. (Population 25 years and over).

- Compared to Wisconsin’s residential population (U.S. Census Bureau), survey respondents are more likely to be college educated.

**Table B-3. Income<sup>1</sup>**

	% of Respondents		
	Wisconsin	Michigan	Census <sup>2</sup>
Less than \$30,000	18%	20%	21%
\$30,000 - \$49,999	19%	16%	25%
\$50,000 - \$74,999	28%	28%	28%
\$75,000 - \$99,000	20%	15%	14%
\$100,000 or more	15%	21%	12%
	<b>(n = 309)</b>	<b>(n = 292)</b>	

<sup>1</sup> Only those customers who provided income information are included (24% of Wisconsin and 27% of Michigan respondents either did not know or refused to answer this question).

<sup>2</sup> U.S. Census Bureau. DP-3 Profile of Selected Economic Characteristics: 2000. Dataset: Census 2000 Summary File 3 (SF 3) Sample Data. Geographic Area: Wisconsin. (Households).

- Compared to Wisconsin’s residential population (U.S. Census Bureau), survey respondents are more likely to have higher incomes.

**Table B-4. Gender**

	% of Respondents		
	Wisconsin	Michigan	Census <sup>1</sup>
Male	52%	45%	49%
Female	48%	55%	51%
	<b>(n = 404)</b>	<b>(n = 400)</b>	

<sup>1</sup>Source: U.S. Census Bureau. DP-1 Profile of General Demographics Characteristics: 2000. Dataset: Census 2000 Summary File 1 (SF 1) 100-percent Data. Geographic Area: Wisconsin. (Total housing units).

- Compared to Wisconsin’s residential population (U.S. Census Bureau), Wisconsin survey respondents are slightly more likely to be male. In Michigan, however, survey respondents are significantly more likely to be female.

## B.2 KEY CROSS-TABULATIONS

In order to provide further insight, we performed a number of cross-tabulation for the purpose of understanding the relationship between key demographic characteristics (i.e., age, education, income, gender) and key survey questions. In particular, we explored the influence of demographic characteristics on consumer awareness, purchase, current use, and intended future use of CFLs. Key findings from these cross-tabulations are outlined below.

- **Age.** In both states, older respondents (those 65 or older) and younger respondents (those under 35) tend to have lower rates of CFL awareness, purchase, use, and intended future use.
- **Education.** In both states, respondents with lower levels of education (high school or less) tend to have lower rates of CFL awareness, purchase, use, and intended future use.
- **Income.** In both states, respondents with lower income levels tend to have lower rates of CFL awareness, purchase, use, and intended future use.
- **Gender.** In both states, male respondents tend to have higher rates of CFL awareness, purchase, and use. However, male and female respondents both appear to be open to purchasing CFLs in the future.