

State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

Residential Lighting Program:
CFL Database Analysis

Final Report: January 20, 2009

Evaluation Contractor: PA Consulting Group

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



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1. EXECUTIVE SUMMARY

The purpose of this report is to present the findings from an analysis of the Wisconsin Focus on Energy Residential Lighting Program (RLP) database. The program database provides a rich source of information regarding the progress of the CFL program. The analysis updates the analysis previously conducted in 2006.¹ Our analysis addresses the following five areas: CFL reward history, manufacturer and retailer activity, customer activity, household penetration, and demographic comparisons. Key findings from each of these five areas are presented below.

We highlight the key study findings below. Though the Executive Summary bullets key points, we also advise the readers to continue to the body of the report because the trends illustrated in the figures and tables are important to fully understand the information presented in this analysis.

1.1 CFL REWARD HISTORY

- The program has rewarded over six million CFLs since its inception in 1998.
- Since 2003, the program has rewarded over one million CFLs in each year except for 2005. The decrease in CFL rewards in 2005 corresponds to a decrease in the program's budget.
- Instant rewards have dominated the program. About 80 percent of rewarded CFLs have been purchased via instant rewards compared to 17 percent via mail-in rewards and five percent via buydown/markdown efforts. The program began a shift in 2007 toward buydown/markdown efforts with retailers. Future program plans will likely continue these buydown/markdown efforts and reduce or phase out mail-in rewards.
- Almost two-thirds of CFLs purchased through the program have been rewarded during the four months of the year (November, December, January, and February) in which the instant reward campaign is most heavily promoted.

1.2 MANUFACTURER AND RETAILER ACTIVITY

- The top three manufacturers comprise over 70 percent of the CFLs rewarded through the program.
- The vast majority (88 percent) of rewarded CFLs have been sold through the home improvement (49 percent) and hardware (39 percent) channels. The mass merchant and grocery/drug channel comprise eight and one percent of CFL rewards, respectively, though activity in these channels has increased during the last two years.
- Over half of the CFLs have been rewarded through two retailers, Menard's (30 percent) and Ace Hardware (25 percent).

¹ Tom Talerico and Rick Winch, Glacier Consulting Group, *State of Wisconsin Department of Administration, Division of Energy, Focus on Energy Public Benefits Evaluation: ENERGY STAR® Products Program—CFL Database Analysis*, critical review by Ralph Prael, Prael and Associates, April 12, 2006.

- Since the program's inception, over 1,300 stores have sold CFLs through the program. The top 10 stores have accounted for almost 30 percent of CFL rewards, with the most active store accounting for 10 percent. Over 60 percent of CFL rewards have been accounted for by the top 50 stores and 92 percent have been comprised by the top 200 stores.

CUSTOMER ACTIVITY

- Overall, over 700,000 customers have purchased a CFL through the program. Over 100,000 customers have purchased CFLs through the program in each of the last five years (2003-2007).
- The average number of CFLs purchased per customer peaked in 2003 (7.9) and has been between 6–7 CFLs in every subsequent year. This decrease is due in part to the program placing limits on the number of CFLs that a customer is able to purchase. On a cumulative basis, 30 percent of customers have purchased three or fewer CFLs through the program, with eight percent purchasing only one CFL. On the higher end, 25 percent have cumulatively purchased twelve or more CFLs through the program, with six percent purchasing 24 or more CFLs.
- The program is continuing to reach new customers. About 110,000 customers first purchased a CFL through the program in 2007. These customers represent 15 percent of all customers who have purchased a CFL through the program since its inception.
- Customers who purchased CFLs through the program are making repeat purchases through the program. In particular, 18 percent of customers who have purchased CFLs through the program have made multiple purchases through the program.
- An analysis of trends in repeat purchasing by year seems to indicate that the percent of customers who will make a repeat purchase through the program may level off in the 35–40 percent range.
- Sixty-four percent of customers who have made multiple purchases through the program have made two purchases, 21 percent have made three purchases, eight percent have made four purchases, and six percent have made five or more purchases.
- Among customers who made multiple purchases, the interval between the first and last program purchase was less than two months for nine percent of customers who made multiple purchases through the program, between two and six months for 10 percent, between seven and twelve months for 15 percent, between one and two years for 21 percent, and more than two years for 44 percent.
- Multiple purchasers, on average, purchase the same number of CFLs (six) on their initial purchase as customers who have made only one purchase through the program. Multiple purchasers then come back and purchase, on average, an additional ten CFLs. This seems to suggest that the initial propensity to invest in CFLs is the same among those customers who purchase again versus those who do not.

This raises the issue, possibly for future research to explore, of why the customers who have made only one purchase do not make a repeat purchase through the program, especially in light of the fact that survey research conducted as part of the installation rate studies shows that both instant and mail-in reward participants are highly satisfied with the CFLs they purchased through the program.

1.3 HOUSEHOLD PENETRATION

- As of the end of 2007, almost a third of Wisconsin households have made at least one CFL purchase through the program since its inception.
- Because the program has been reaching new customers consistently during the last five years of high activity, household penetration has increased roughly five percentage points each year since 2002
- Each of the three largest counties in terms of number of households (Milwaukee, Dane, and Waukesha) has a penetration equal to or higher than the statewide average.

1.4 DEMOGRAPHIC COMPARISONS

- Compared to the Wisconsin population, customers who purchased CFLs through the program are more likely to have lived in their residence for a longer period of time, more likely to have a college or advanced degree, less likely to have household incomes less than \$15,000, and more likely to be male.
- Compared to customers who received instant rewards, customers who received mail-in rewards were less likely to live in older residences, more likely to have a college or advanced degree, and more likely to have incomes of \$75,000 or more.
- Among customers who purchased CFLs via instant rewards, those who purchased at:
 - Mills Fleet Farm/Blain's Farm and Fleet were less likely to live in older homes and less likely to have a college or advanced degree.
 - Ace/Hardware Hank/True Value were more likely to have lived in their residences for a longer period of time.
 - Menards were less likely to have incomes between \$15,000 and \$49,999, less likely to be from households comprised of individuals in the 66 or older age range, and less likely to be male.
- Among customers who purchased CFLs via mail-in rewards, those who purchased at:
 - Ace/Hardware Hank/True Value were less likely to have incomes of \$75,000 or more, more likely to be from households comprised of individuals in the 66 or older age range, and more likely to be female.
 - Home Depot were more likely to have lived in their residences for a shorter period of time, more likely to have incomes of \$75,000 or more, less likely to be from households comprised of individuals in the 66 or older age range, and more likely to be male.

- Independents were more likely to have lived in their homes for a longer period of time.
- Menards were more likely to have lived in their residences for a shorter period of time.
- Mills Fleet Farm/Blain's Farm and Fleet were more likely to live in older homes, less likely to have a college or advanced degree, and more likely to have incomes in the \$15,000–\$49,999 range.

2. STUDY FINDINGS

The purpose of this report is to present the findings from an analysis of the Wisconsin Focus on Energy Residential Lighting Program (RLP) database. The program database provides a rich source of information regarding the progress of the CFL program. The analysis updates the analysis previously conducted in 2006 and covers RLP activity through 2007.²

Study findings are presented below. Subsections correspond to each of the five areas that the analysis addressed: CFL reward history, manufacturer and retailer activity, customer activity, household penetration, and demographic comparisons.

2.1 CFL REWARD HISTORY

Table 2-1 shows the overall number of CFL rewards through 2007 and the distribution of these rewards by reward type. Wisconsin CFL efforts have rewarded over six million CFLs since inception in 1998.³ Instant rewards have dominated the program. About 80 percent of rewarded CFLs have been purchased via instant rewards compared to 17 percent via mail-in rewards and five percent via buydown/markdown efforts.⁴

Table 2-1. Rewards by Type

Reward Type	Number of CFLs	Percent of Overall
Overall	6,074,839	
Instant	4,729,988	78%
Mail-In ¹	1,050,051	17%
Buydown/Markdown	294,800	5%

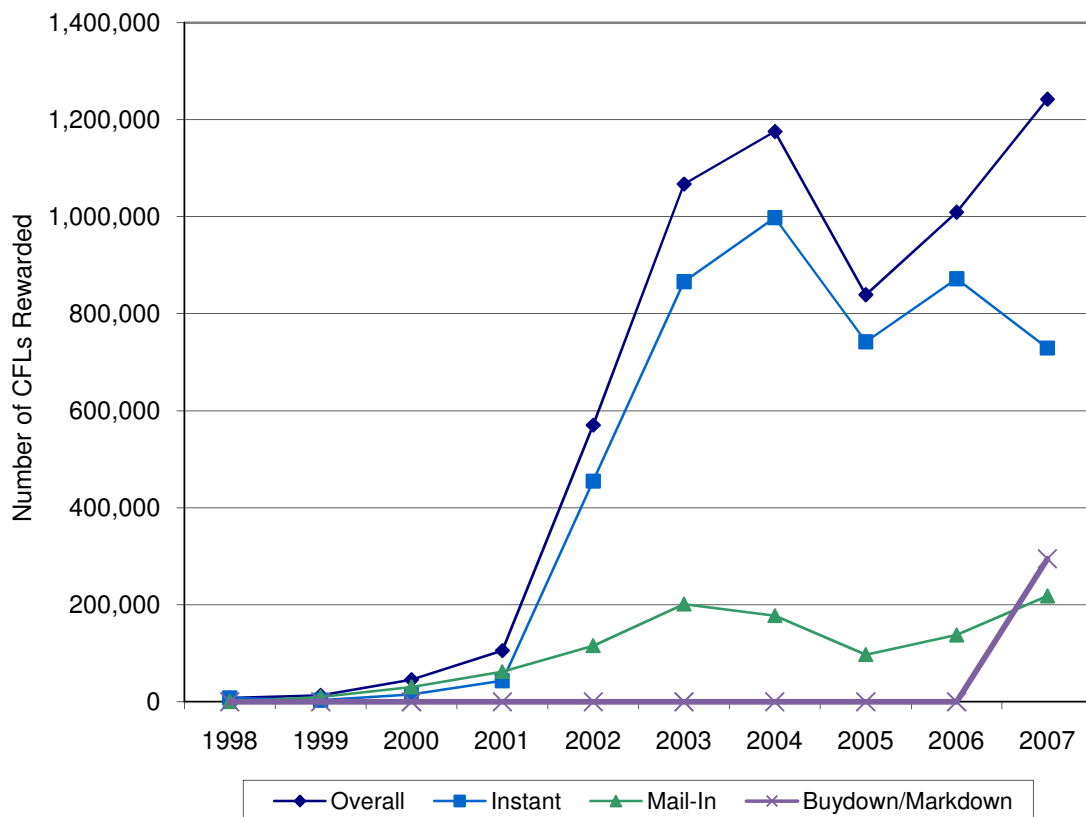
² Tom Talerico and Rick Winch, Glacier Consulting Group, *State of Wisconsin Department of Administration, Division of Energy, Focus on Energy Public Benefits Evaluation: ENERGY STAR® Products Program—CFL Database Analysis*, critical review by Ralph Prael, Prael and Associates, April 12, 2006.

³ The Wisconsin CFL program began in 1998 under the name Best Connection and has since evolved into RLP. These early efforts were implemented by Wisconsin Energy Conservation Corporation under contract to various Wisconsin utilities. Full-scale implementation of Focus on Energy started in 2001.

⁴ For mail-in rewards, the analysis only covers activity that is tracked by the program through customers who returned the mail-in reward coupon. The analysis does not address those customers who purchased a CFL eligible for a mail-in reward but did not return the mail-in reward coupon. Similarly, we are unable to perform any customer analysis for CFLs purchased via buydown/markdown efforts because these efforts cannot track customer information.

Figure 2-1 illustrates trends in CFL rewards, overall and by type, from 1998 through 2007. The number of CFLs rewarded through the program increased dramatically, from about 600,000 CFLs to over 1.2 million CFLs between 2002 to 2007.⁵ Since 2003, the program has rewarded over one million CFLs in each year except for 2005. The decrease in CFL rewards in 2005 corresponds to a decrease in the program’s budget. Finally, the program began a shift in 2007 toward buydown/markdown efforts with retailers. Future program plans will likely continue these buydown/markdown efforts and reduce or phase out mail-in rewards.

Figure 2-1. CFL Rewards by Year¹

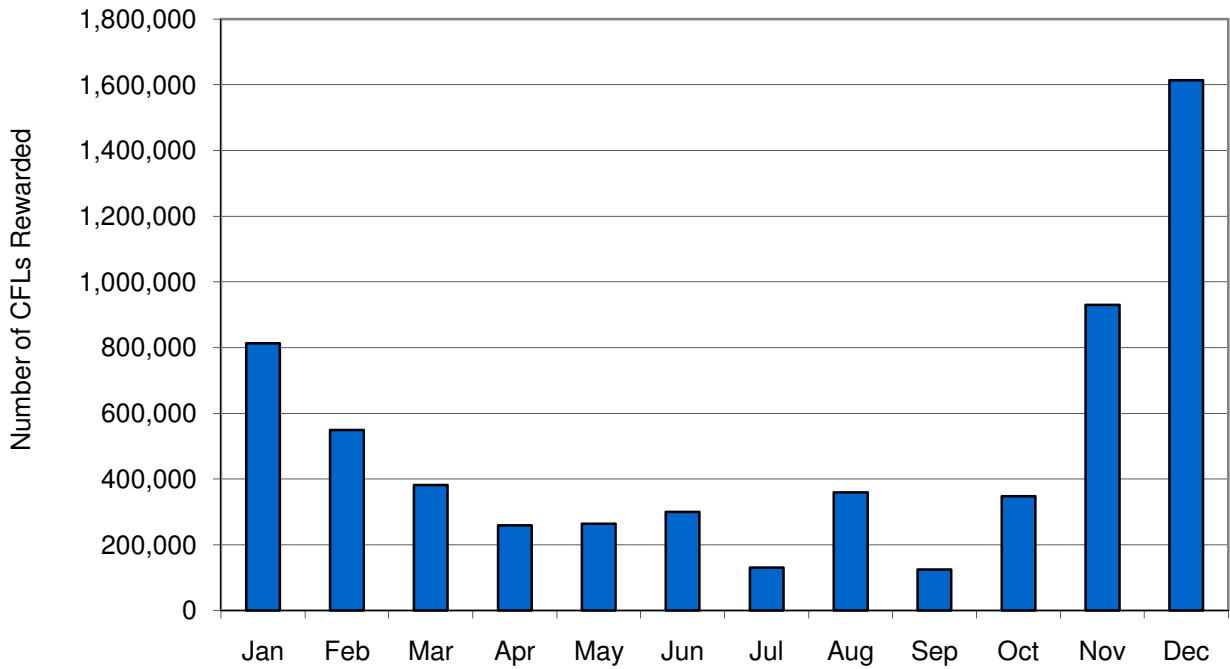


¹ Full-scale implementation of Focus on Energy started in 2001.

⁵ Full-scale implementation of Focus on Energy started in 2001.

Figure 2-2 presents CFL rewards by month. Over a quarter of all CFLs rewarded through the program have been rewarded during the month of December. This makes sense given that the Change-A-Light campaign is heavily promoted during November, December, January, and February. In all, almost two-thirds of CFLs have been rewarded during these four months.

Figure 2-2. CFLs Rewards by Month



2.2 MANUFACTURER AND RETAILER ACTIVITY

Table 2-2 shows the distribution of CFL rewards by manufacturer. The top three manufacturers comprise over 70 percent of the CFLs rewarded through the program.

Table 2-2. Rewards by Manufacturer

Manufacturer	Number of CFLs	Percent of Overall
GE	1,949,122	32%
Buyers Choice	1,384,869	23%
Westinghouse	1,034,329	17%
Feit	411,221	7%
TCP/n:vision	388,083	6%
Greenlite	338,156	6%
Sylvania	100,813	2%
Lights of America	71,944	1%
Maxlite	62,672	1%
Philips	58,405	1%
Other	57,918	1%
Unknown	217,307	4%
Overall	6,074,839	

Table 2-3 shows the distribution of CFL rewards by retailer channel. The vast majority (88 percent) of rewarded CFLs have been sold through the home improvement (49 percent) and hardware (39 percent) channels. The mass merchant and grocery/drug channel comprise eight and one percent of CFL rewards, respectively, though activity in these channels has increased during the last two years.

Table 2-3. Rewards by Retailer Channel

Retailer Channel	Number of CFLs	Percent of Overall
Home Improvement	2,955,791	49%
Hardware	2,362,661	39%
Mass Merchant	478,765	8%
Grocery/Drug	65,014	1%
Other	206,447	3%
Missing	6,161	>1%
Overall	6,074,839	

Table 2-4 shows the distribution of CFL rewards by retailer, in general. Over half of the CFLs have been rewarded through two retailers, Menards (30 percent) and Ace Hardware (25 percent).

Table 2-4. Rewards by Retailer — General

Retailer Description	Number of CFLs	Percent of Overall
Menards	1,805,968	30%
Ace	1,537,257	25%
Mills Fleet Farm	673,668	11%
True Value	632,986	10%
Home Depot	421,226	7%
Sam's Club	311,210	5%
Other	153,526	3%
Hardware Hank	116,666	2%
Shopko	107,304	2%
Sentry	62,624	1%

Retailer Description	Number of CFLs	Percent of Overall
Blains Farm & Fleet	46,493	1%
Big Lots	46,456	1%
Do-It-Best	37,200	1%
Home Concept	34,466	1%
Other	87,789	1%
Overall	6,074,839	

Table 2-5 shows the distribution of CFL rewards by retailer for individual store groupings.⁶ Since the program’s inception, over 1,300 stores have sold CFLs through the program. The top 10 stores have accounted for almost 30 percent of CFL rewards, with the most active store accounting for 10 percent. Over 60 percent of CFL rewards have been accounted for by the top 50 stores and 92 percent have been comprised by the top 200 stores.

Table 2-5. Distribution of Rewards—Individual Store Groupings

Store Grouping	Number of CFLs	Cumulative Percent
Top 10	1,761,703	29%
11 – 25	911,226	44%
26 – 50	1,093,471	62%
51 – 100	971,974	78%
101 – 200	850,477	92%
201 – 400	303,742	97%
401 – 1,320	60,748	98%
Missing Store ID	121,497	100%
Overall	6,074,839	

⁶ We do not report findings at the individual store level to maintain confidentiality. The database contains an ID for each store. We used this ID as the store identifier for our analysis.

2.3 CUSTOMER ACTIVITY

Table 2-6 shows the number of customers who purchased CFLs through the program, overall and for each year.⁷ Overall, over 700,000 customers have purchased a CFL through the program. Over 100,000 customers have purchased CFLs through the program in each of the last five years (2003-2007).

Table 2-6. Customers by Year

Year	Number of Customers
Overall ¹	706,490
2007	144,522
2006	158,028
2005	132,976
2004	166,954
2003	134,973
2002	72,953
2001	25,711
2000	8,871
1999	3,618
1998	1,833

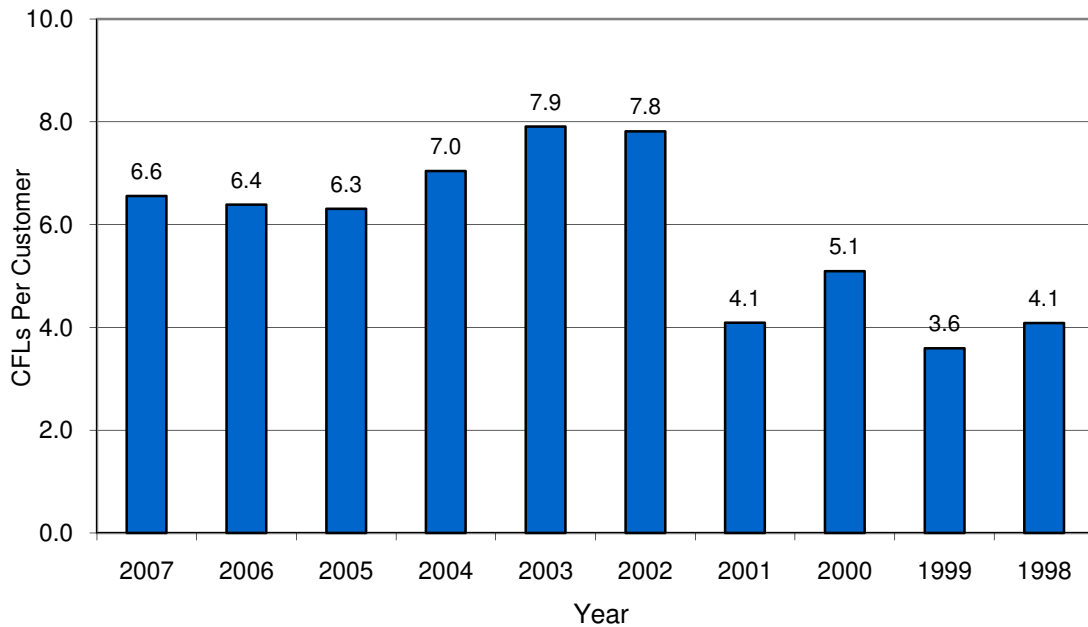
¹ Households that purchased in more than one year are only counted once.

Please note that the sum of the number of customers across years is greater than the overall number of customers because of customers purchasing CFLs in multiple years. The frequency with which customers make multiple purchases is addressed later in this section.

⁷ The database contains an ID for each customer based on a combination of the customer's last name, numeric portion of the street address, and five-digit zip code. We used this ID as the customer identifier for our analysis.

Figure 2-3 shows the average number of CFLs purchased per customer by year. The average number of CFLs purchased per customer peaked in 2003 (7.9) and has been between 6–7 CFLs in every subsequent year. This decrease is due in part to the program placing limits on the number of CFLs that a customer is able to purchase.⁸

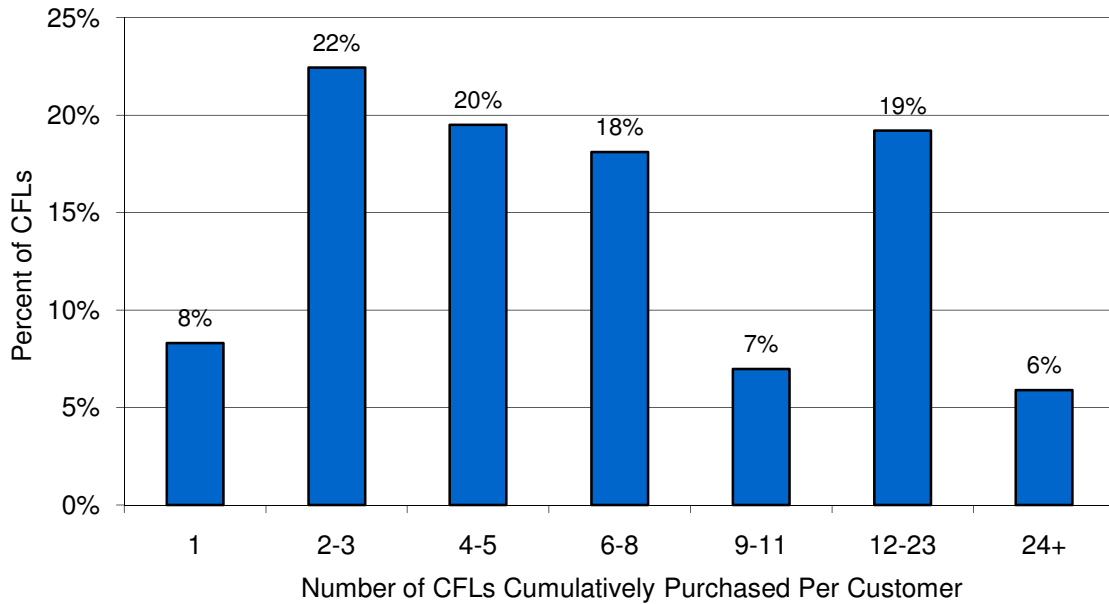
Figure 2-3. Average Number of CFLs Purchased Per Customer



⁸ At program inception, customers were allowed to purchase as many CFLs as they wanted. Starting in 2003, customers were limited to a maximum of 24 CFLs per store visit. In 2004, customers were further limited to a maximum of 12 CFLs per store visit. Please see the following installation rate study conducted by the evaluation team for a more in-depth analysis of the effects of these limits on the number of CFLs purchased and installed: *State of Wisconsin, Department of Administration, Division of Energy, Focus on Energy Statewide Evaluation Residential Programs: Compact Fluorescent Lighting Installation Rate Study Final Report*, November 29, 2005.

Figure 2-4 presents the distribution of the number of CFL purchased per customer cumulatively across all years. On the lower end, 30 percent have cumulatively purchased three or fewer CFLs through the program, with eight percent purchasing only one CFL. On the higher end, 25 percent have cumulatively purchased twelve or more CFLs through the program, with six percent purchasing 24 or more CFLs.

Figure 2-4. Distribution of Number of CFLs Cumulatively Purchased Per Customer



To analyze customer purchase activity over time, we assigned customers into cohorts based on the year in which the initial CFL purchase was made. Table 2-7 shows the number of customers in each cohort. If a customer first purchased a CFL in 2005 then that customer would be assigned to the 2005 cohort, regardless if the customer made purchases in subsequent years. The data show that the program is continuing to reach new customers. About 110,000 customers first purchased a CFL through the program in 2007. These customers represent 15 percent of all customers who have purchased a CFL through the program since its inception.

Table 2-7. Customer Cohorts by Year

Cohort	Number of Customers	Percent of Overall
Overall	706,490	
2007	106,140	15%
2006	122,647	17%
2005	106,513	15%
2004	143,221	20%
2003	120,925	17%
2002	68,467	10%
2001	24,589	3%
2000	8,604	1%
1999	3,551	1%
1998	1,833	< 1%

Please note that the sum of the number of customers in each cohort equals the overall number of customers.

Now that customers have been assigned into cohorts, we can analyze the composition of CFL rewards for each year in terms of cohort distribution. Before looking across all years, we first address the cohort distribution for rewarded CFLs in 2007 (Figure 2-5). Seventy-three percent of the CFLs rewarded in 2007 were purchased by customers in the 2007 cohort. This means that 73 percent of the CFLs rewarded in 2007 were purchased by customers who made their first purchase of CFLs through the program in 2007. The remaining 27 percent of CFLs were purchased by cohorts prior to 2007. For example, five percent of CFLs were purchased by customers in the 2006 cohort, meaning that these customers first purchased CFLs through the program in 2006 and also purchased CFLs through the program again in 2007.

Figure 2-5. Customer Cohort Distribution for CFLs Rewarded in 2007

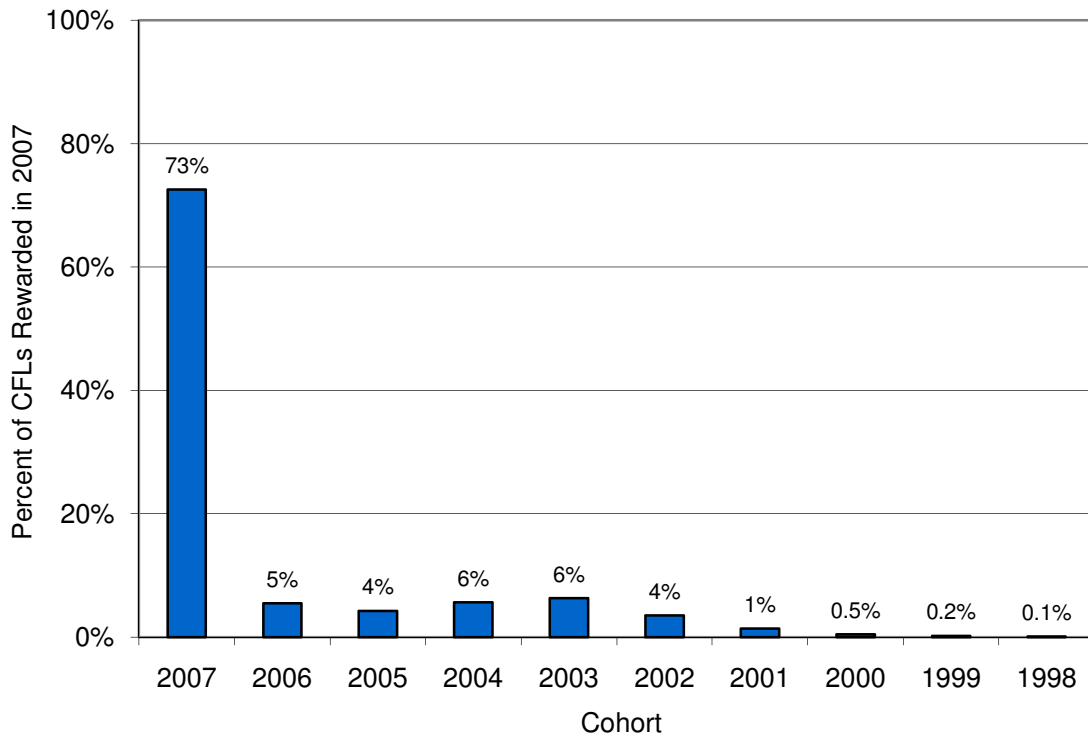
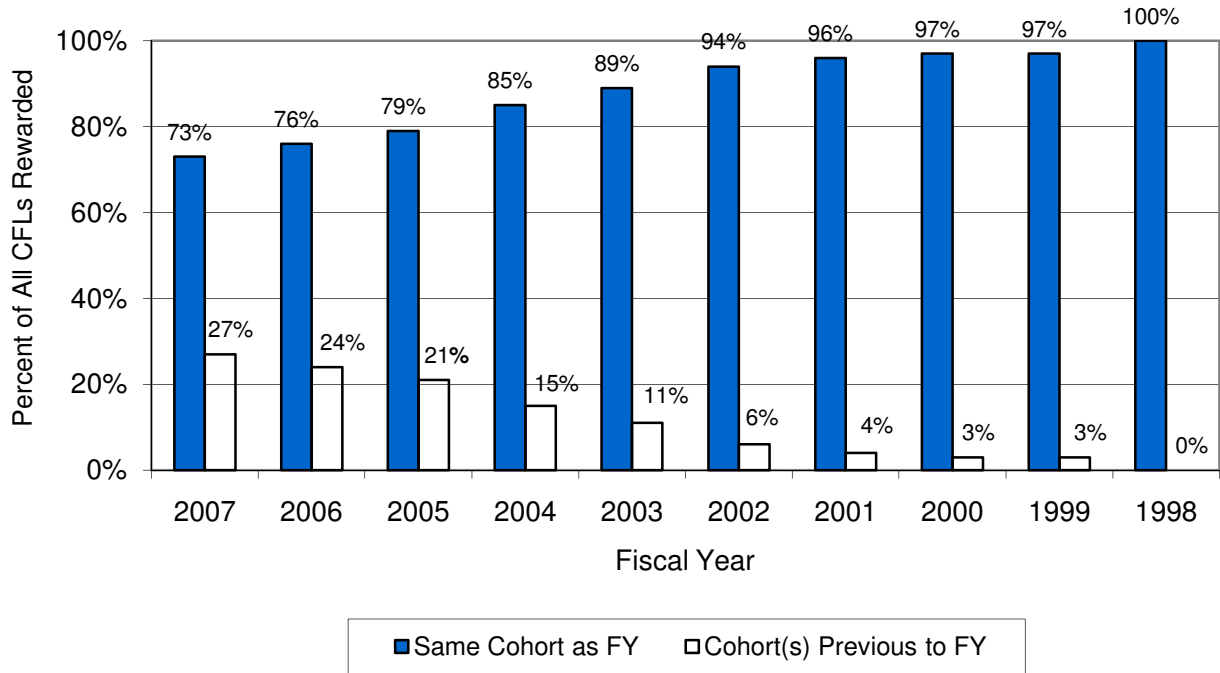


Figure 2-6 shows the cohort distribution for CFLs that were purchased through the program in each year.⁹ The results show that the percent of CFLs purchased by customers who had previously purchased CFLs through the program has been increasing. The majority of CFLs rewarded in each year, however, is still being purchased by customers who made their first purchase of CFLs through the program in that year. For example, 76 percent of the CFLs rewarded in 2006 were purchased by customers who made their first purchase of CFLs through the program in 2006. The remaining 24 percent of CFLs rewarded during 2006 were purchased by cohorts prior to 2006.

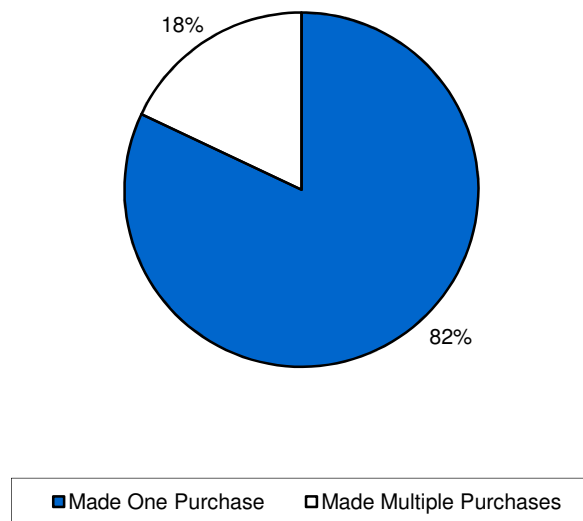
⁹ The more detailed analysis for 2007 (shown in Figure 2-5) provided a breakdown of all cohorts that purchased CFLs in 2007. For simplicity sake, the analysis presented in Figure aggregates the cohorts that purchased CFLs in each year of interest into two groups. The first is the cohort of the year of interest, and the second is all cohorts prior to the year of interest combined. As an example, for 2007, we illustrate the 73 percent of CFLs that were purchased by the 2007 cohort and the remaining 27 percent that were purchased in aggregate by cohorts prior to 2007.

Figure 2-6. Customer Cohort Distribution for CFLs Purchased in Each Year



While the cohort analysis sheds some light on the extent to which customers are making multiple purchases through the program, it does not fully show the extent to which customers are making multiple purchases through the program.¹⁰ This is because customers do make multiple purchases within a year. For example, the cohort analysis would not account for activity of a customer in the 2006 cohort who does not make a purchase in 2007 but makes multiple purchases in 2006. Figure 2-7 illustrates the extent to which customers are making multiple purchases. Overall, 18 percent of customers who have purchased CFLs through the program have made multiple purchases through the program. The remaining 82 percent have only made one purchase through the program.

Figure 2-7. Multiple Purchases (Percent of Customers)



¹⁰ For this analysis, a customer is deemed to have made multiple purchases if the customer purchased CFLs through the program on multiple dates. Also, please note that multiple purchases are distinct from the number of CFLs purchased, though related given that a customer is more likely to have purchased more CFLs if they have made multiple purchases. For example, a customer who purchased six CFLs on, say, March 15, 2007, and never purchased another CFL through the program would be categorized as having made only one purchase. The customer would be categorized as having made multiple purchases if this customer had made additional purchases on occasions other than March 15, 2007.

Figure 2-8 shows the frequency of multiple purchases through the program for customers in each cohort. Because customers in earlier cohorts have had more opportunities to make multiple purchases through the program, the percent of customers who have made multiple purchases through the program is higher in earlier cohorts and lower in later cohorts. It is interesting to point out, however, that the percent of customers making multiple purchases through the program is similar (in the 35–40 percent range) among customers in the 1998 through 2001 cohorts. This result would seem to indicate that the percent of customers who will make a repeat purchase through the program may level off in the 35–40 percent range. Finally, the difference in multiple purchases through the program between each consecutive cohort subsequent to 2001 is in the 3–9 percentage point range. For example, 27 percent of customer in the 2003 cohort made multiple purchases through the program compared to 18 percent for the 2004 cohort, a difference of nine percentage points; likewise, 15 percent of customers in the 2005 cohort made multiple purchases through the program, which is three percentage points lower than the 2004 cohort.

Figure 2-8. Multiple Program Purchases by Cohort

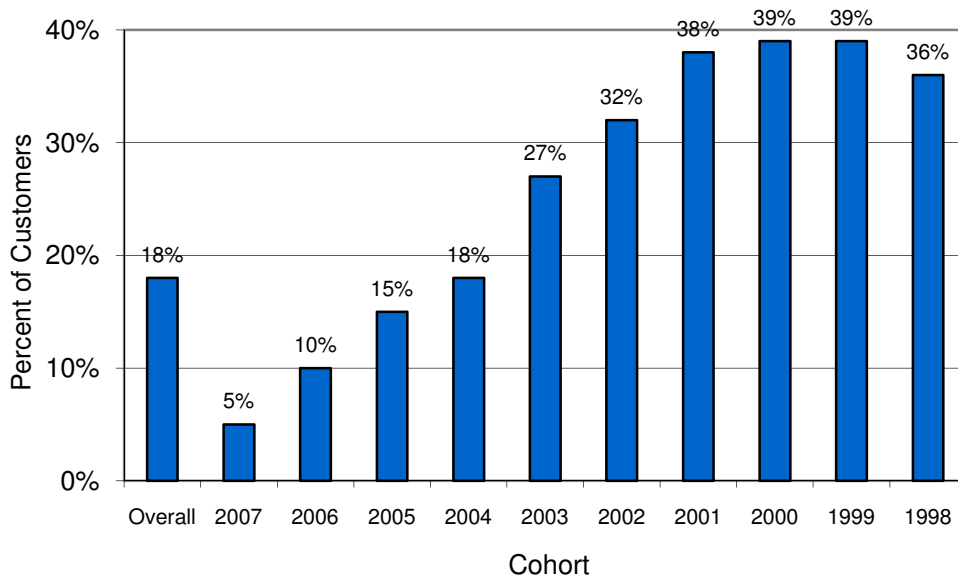


Figure 2-9 presents the number of program purchases made by customers who have made multiple purchases through the program. Sixty-four percent of customers who have made multiple purchases through the program have made two purchases, 21 percent have made three purchases, eight percent have made four purchases, and six percent have made five or more purchases.

**Figure 2-9. Number of Program Purchases among Multiple Purchasers
(Percent of Multiple Purchasers)**

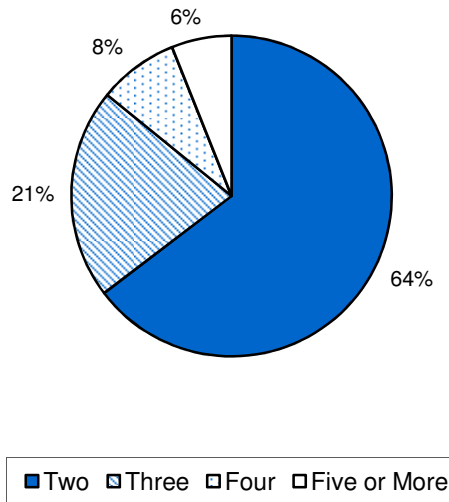


Figure 2-10 shows the number of program purchases made by customers in each cohort who have made multiple purchases through the program. Because customers in earlier cohorts have had more opportunities to make multiple purchases through the program, multiple purchasers in earlier cohorts will likely have made more purchases than those in later cohorts. For example, about 25 percent of the customers in the 2005 cohort who made multiple purchases through the program made three or more purchases, compared to 10 percent of customers in the 2007 cohort who made multiple purchases.

Figure 2-10. Number of Program Purchases among Multiple Purchasers by Cohort

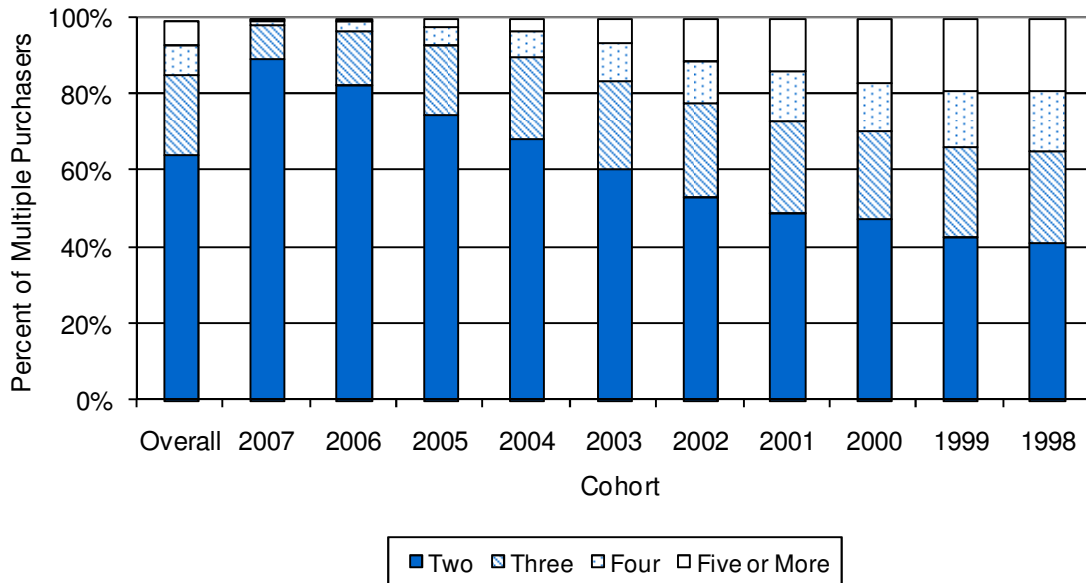
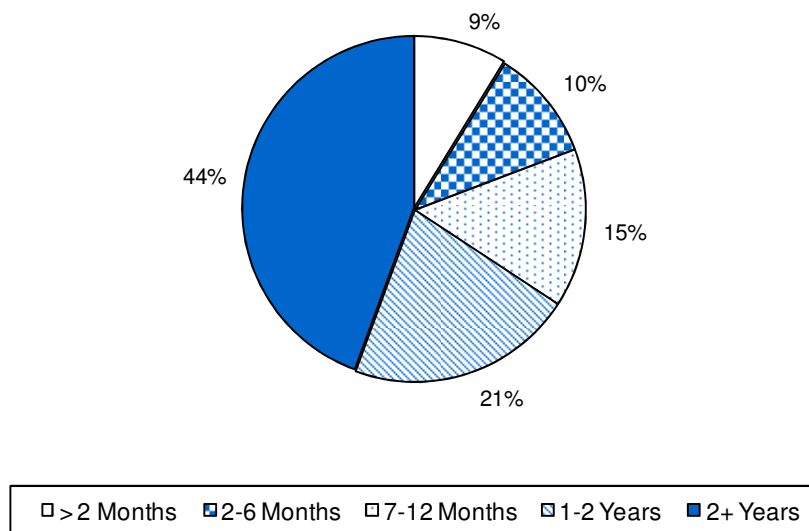


Figure 2-11 illustrates the interval between the first and last program purchase for customers who have made multiple purchases through the program. The interval between the first and last program purchase was less than two months for nine percent of customers who made multiple purchases through the program, between two and six months for 10 percent, between seven and twelve months for 15 percent, between one and two years for 21 percent, and more than two years for 44 percent.

Figure 2-11. Interval between First and Last Program Purchase among Multiple Purchasers (Percent of Multiple Purchasers)



We cannot definitively determine if those customers who are purchasing again through the program more than one year after their initial program purchase are replacing CFLs originally purchased through the program that have burnt out or are expanding the number of new fixtures in which they are using CFLs. We would surmise that repeat purchases within a year are likely for expansion to other fixtures rather than replacement of CFLs originally purchased through the program that have burnt out.

Figure 2-12 shows the interval between the first and last program purchase for customers in each cohort who have made multiple purchases through the program. Again, because customers in earlier cohorts have had more opportunities to make multiple purchases through the program, multiple purchasers in earlier cohorts will likely have longer intervals between their first and last purchase through the program. For example, the interval between the first and last program purchase was one year or longer for 52 percent of the customers in the 2005 cohort who made multiple purchases through the program, compared to 29 percent for customers in the 2006 cohort who made multiple purchases.

Figure 2-12. Interval between First and Last Program Purchase among Multiple Purchasers by Cohort

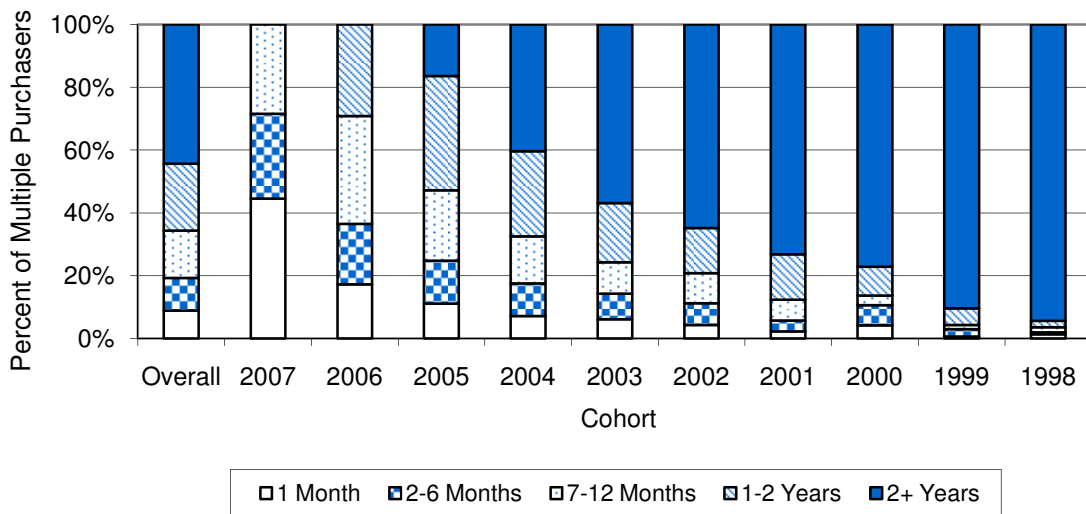
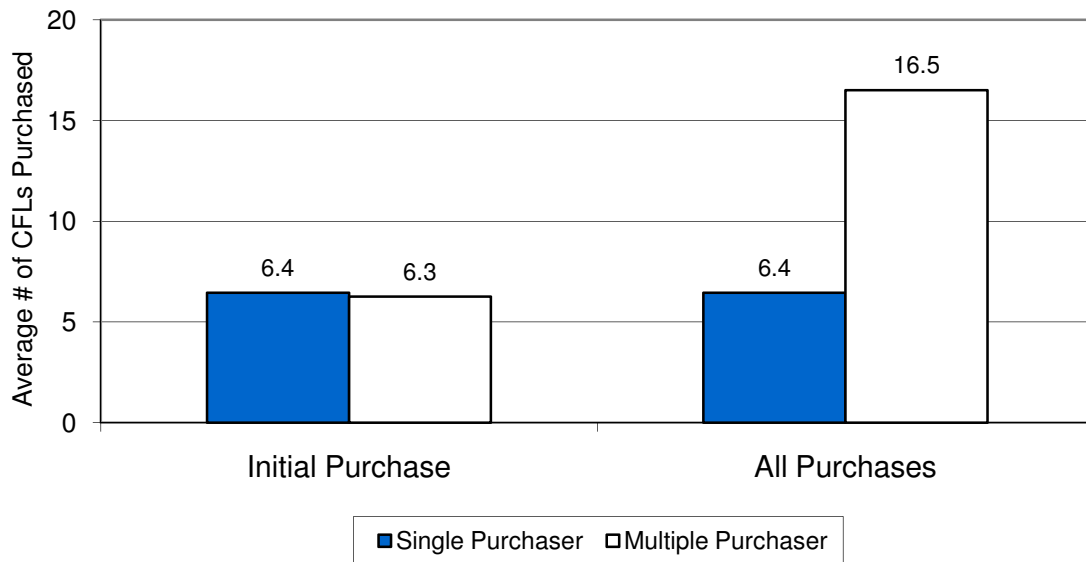


Figure 2-13 compares the average number of CFLs purchased between single and multiple program purchasers. Customers who have made only one purchase through the program have purchased an average of 6.4 CFLs. Customers who have made multiple purchases through the program have purchased an average of 16.5 CFLs. Multiple purchasers, however, on average purchase the same number of CFLs on their initial purchase as customers who have made only one purchase through the program. This seems to suggest that the initial propensity to invest in CFLs is the same among those customers who purchase again versus those who do not. This raises the issue, possibly for future research to explore, of why the customers who have made only one purchase do not make a repeat purchase through the program, especially in light of the fact that survey research conducted as part of the installation rate studies shows that both instant and mail-in reward participants are highly satisfied with the CFLs they purchased through the program.¹¹

Figure 2-13. Average Number of CFLs Purchased—Single vs. Multiple Purchasers

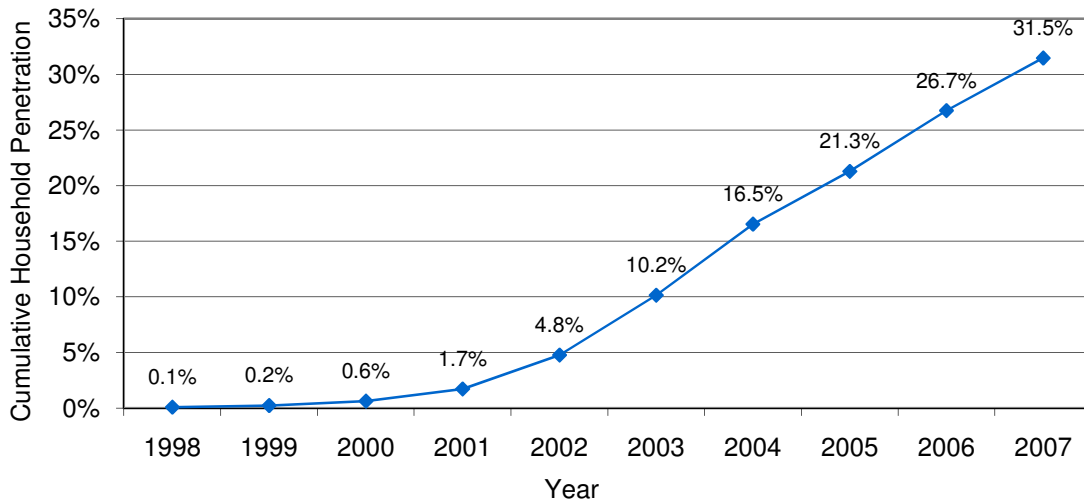


¹¹ *State of Wisconsin, Department of Administration, Division of Energy, Focus on Energy Statewide Evaluation Residential Programs: Compact Fluorescent Lighting Installation Rate Study Final Report, October 24, 2003; State of Wisconsin, Department of Administration, Division of Energy, Focus on Energy Statewide Evaluation Residential Programs: Compact Fluorescent Lighting Installation Rate Study Final Report, November 29, 2005; and State of Wisconsin, Public Service Commission of Wisconsin, Focus on Energy Evaluation Residential Lighting Program: Compact Fluorescent Lighting Installation Rate Study Final Report, December 27, 2007.*

2.4 HOUSEHOLD PENETRATION

Figure 2-14 illustrates the growth of the program in terms of household penetration.¹² As of the end of 2007, almost a third of Wisconsin households have purchased a CFL through the program. Because the program has been reaching new customers consistently during the last five years of high activity, household penetration has increased roughly five percentage points each year since 2002.

Figure 2-14. Household Penetration of Rewarded CFLs¹



¹ Source for total number of Wisconsin households: ESTIMATED OCCUPIED HOUSING UNITS (HOUSEHOLDS) FOR WISCONSIN COUNTIES, Demographic Services Center, Wisconsin Department of Administration.

¹² As discussed earlier, the database contains an ID for each customer based on a combination of the customer's last name, numeric portion of the street address, and five-digit zip code, and we used this ID as the customer identifier for our analysis. Because this ID can also reasonably represent households, we use the number of customers as a proxy for number of households. Please note that if multiple household members with the same last name purchase CFLs through the program then the ID would be the same for each member, and our analysis would not be affected. If, on the other hand, multiple household members with different last names purchase CFLs through the program then the ID would denote a single household as multiple households, and our analysis would be over-reporting the number of households for these cases.

Table 2-8 shows household penetration for the top 20 counties in terms of household penetration. Penetration in these 20 counties is 42 percent, with three of these counties (Sawyer, Shawano, and Rusk) having penetration in excess of 50 percent. In all, these 20 counties represent 36 percent of the customers who have purchased a CFL through the program (250,841 out of 706,490).

Table 2-8. Household Penetration by County—Top 20 in Terms of Penetration

County	Number of Customers	Number of Households	Penetration
Overall — statewide	706,490	2,244,623	31%
Overall — top 20	250,841	592,223	42%
Sawyer County	5,822	7,307	80%
Shawano County	11,823	18,495	64%
Rusk County	3,343	6,461	52%
Chippewa County	11,084	23,558	47%
Waukesha County	65,416	146,710	45%
Rock County	27,640	62,593	44%
Calumet County	7,446	17,493	43%
Waupaca County	8,814	21,160	42%
Washington County	20,056	48,896	41%
Fond du Lac County	16,048	39,255	41%
Green Lake County	3,233	8,026	40%
Langlade County	3,444	9,016	38%
Portage County	10,247	26,984	38%
Outagamie County	25,002	67,067	37%
Menominee County	508	1,405	36%
Vilas County	3,488	9,724	36%
Dodge County	11,882	33,582	35%
Pepin County	1,054	2,980	35%
Ozaukee County	11,802	33,597	35%
Taylor County	2,689	7,916	34%

Table 2-9 presents household penetration for the bottom 20 counties in terms of household penetration. Penetration in these 20 counties is 16 percent. In all, these 20 counties represent only seven percent of the customers who have purchased a CFL through the program (52,661 out of 706,490).

Table 2-9. Household Penetration by County—Bottom 20 in Terms of Penetration

County	Number of Customers	Number of Households	Penetration
Overall — statewide	706,490	2,244,623	31%
Overall — bottom 20	52,661	333,865	16%
Florence County	147	2,279	6%
Sauk County	1,764	22,846	8%
Sheboygan County	4,976	50,215	10%
Pierce County	1,596	14,547	11%
Monroe County	2,118	16,796	13%
Buffalo County	752	5,884	13%
Grant County	2,802	19,313	15%
Juneau County	1,562	10,659	15%
Trempealeau County	1,728	11,510	15%
Burnett County	1,129	7,124	16%
Polk County	3,026	18,063	17%
Adams County	1,483	8,758	17%
Door County	2,312	13,016	18%
Iron County	576	3,238	18%
Lafayette County	1,187	6,499	18%
Vernon County	2,229	11,646	19%
Crawford County	1,361	7,016	19%
Walworth County	7,976	38,310	21%
Wood County	6,665	31,778	21%
Manitowoc County	7,272	34,367	21%

Table 2-10 shows household penetration for the top 20 counties in terms of number of households (i.e., the 20 largest counties in terms of number of households, which is different from results presented earlier in Table 2-8 for the 20 counties with the highest household penetration). Penetration in these 20 counties is 33 percent. Each of the three largest counties (Dane, and Waukesha) has a penetration equal to or higher than the statewide average. The six counties with penetrations lower than the statewide average are shaded in gray.

Table 2-10. Household Penetration by County—Top 20 in Terms of Households

County	Number of Customers	Number of Households	Penetration
Overall — statewide	706,490	2,244,623	31%
Overall — top 20	521,146	1,599,707	33%
Milwaukee County	119,844	383,825	31%
Dane County	64,111	195,555	33%
Waukesha County	65,416	146,710	45%
Brown County	31,133	96,719	32%
Racine County	23,513	75,000	31%
Outagamie County	25,002	67,067	37%
Winnebago County	22,209	66,226	34%
Rock County	27,640	62,593	44%
Kenosha County	15,925	61,283	26%
Marathon County	17,191	52,039	33%
Sheboygan County	4,976	50,215	10%
Washington County	20,056	48,896	41%
La Crosse County	10,138	43,896	23%
Fond du Lac County	16,048	39,255	41%
Eau Claire County	12,347	38,794	32%
Walworth County	7,976	38,310	21%
Manitowoc County	7,272	34,367	21%
Ozaukee County	11,802	33,597	35%
Dodge County	11,882	33,582	35%
Wood County	6,665	31,778	21%

2.5 DEMOGRAPHIC COMPARISONS

In this section, we compare and contrast the demographic characteristics of customers who purchased CFLs through the program. We considered the following six demographic characteristics:

- Year residence built
- Years in residence
- Education level
- Household income
- Household age
- Gender

Although the program database does not contain demographic information for customers, we do have demographic information for a small subset of customers that were surveyed as part of the 2003, 2005, and 2007 installation rate studies.¹³

We conducted three sets of demographic comparisons. In the first set, we compare customers who purchased CFLs via instant rewards to customers who purchased via mail-in rewards. The second and third sets make comparisons across retailers. In the second set, we isolate customers who purchased CFLs via instant rewards and look at differences in demographics across the retailers at which the customers purchased CFLs. The analysis in the third set is the same as that in the second, except that we isolate customers who purchased CFLs via mail-in rewards. All three sets also include comparisons to the Wisconsin population.

We present the results of these three sets of demographic comparisons in the remainder of this report.

¹³ *State of Wisconsin, Department of Administration, Division of Energy, Focus on Energy Statewide Evaluation Residential Programs: Compact Fluorescent Lighting Installation Rate Study Final Report*, October 24, 2003; *State of Wisconsin, Department of Administration, Division of Energy, Focus on Energy Statewide Evaluation Residential Programs: Compact Fluorescent Lighting Installation Rate Study Final Report*, November 29, 2005; and *State of Wisconsin, Public Service Commission of Wisconsin, Focus on Energy Evaluation Residential Lighting Program: Compact Fluorescent Lighting Installation Rate Study Final Report*, December 27, 2007.

2.5.1 Instant vs. Mail-in

Table 2-11 compares year residence built and years in residence. The distribution of year residence built among customers who received instant rewards is about the same as that for the Wisconsin population. Compared to customers who received instant rewards, customers who received mail-in rewards were more likely to live in residences that were built between 1970 and 1994 (45 vs. 36 percent) and less likely to live in residences that were built in 1969 or earlier (45 vs. 54 percent). The distribution of years in residence among both customers who received instant rewards and customers who received mail-in rewards is different from the Wisconsin population. Customers who purchased CFLs through the program were more likely to have lived in their residence since 1989 or earlier (55 and 51 percent vs. 37 percent).

Table 2-11. Year Residence Built/Years in Residence

	Instant	Mail-In	Census ¹
Year Residence Built²			
1969 or Earlier	54%	45%	56%
1970–1994	36%	45%	35%
1995–2000	10%	10%	9%
N	701	518	2,321,144
Years in Residence²			
1989 or Earlier	55%	51%	37%
1990–2000	45%	49%	63%
n	669	469	2,084,544

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

² In order to compare to Census data, the table does not include the period subsequent to 2000.

Table 2-12 compares education levels and household incomes. Education levels among both customers who received instant rewards and customers who received mail-in rewards are different from the Wisconsin population. For example, customers who purchased CFLs through the program were more likely to have a college or advanced degree (32 and 39 percent vs. 22 percent). Compared to customers who received mail-in rewards, customers who received instant rewards were less likely to have a college or advanced degree (32 vs. 39 percent). The distribution of household income among both customers who received instant rewards and customers who received mail-in rewards is also somewhat different from the Wisconsin population. In particular, customers who purchased CFLs through the program were less likely to have household incomes less than \$15,000 (3 percent each vs. 13 percent). Compared to customers who received mail-in rewards, customers who received instant rewards were less likely to have incomes of \$75,000 or more (21 vs. 32 percent).

Table 2-12. Education Level/Household Income

	Instant	Mail-In	Census ¹
Education Level			
Not High School Graduate	3%	3%	15%
High School Graduate	31%	32%	35%
Some Tech/College	23%	17%	21%
Tech Grad/Assoc Degree	12%	9%	7%
College or Advanced Degree	32%	39%	22%
n	777	568	3,475,878
Household Income			
Less than \$15,000	3%	3%	13%
\$15,000–\$49,999	48%	42%	44%
\$50,000–\$74,000	28%	23%	23%
\$75,000 +	21%	32%	20%
n	573	441	2,086,304

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

Table 2-13 compares household age distribution and gender. The age distribution among households of both customers who received instant rewards and customers who received mail-in rewards is comparable to each other and to that for the Wisconsin population. The proportion of males among both customers who received instant rewards and customers who received mail-in rewards is higher than that of the Wisconsin population (60 and 62 percent vs. 49 percent). The proportion of males, however, is similar among customers who received instant rewards and customers who received mail-in rewards.

Table 2-13. Household Age Distribution/Gender

	Instant	Mail-In	Census ¹
Household Age Distribution²			
17 or Younger	21%	25%	26%
18 to 65	60%	61%	61%
66 or Older	19%	15%	13%
n	799	577	5,363,675
Gender			
Male	60%	62%	49%
Female	40%	38%	51%
n	821	595	5,363,675

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

² Census data for these categories are 18-64 and 65 or older.

2.5.2 Retailer Comparison

We now make comparisons across retailers. We first isolate customers who purchased CFLs via instant rewards and look at differences in demographics across the retailers at which the customers purchased CFLs. We then do the same for customers who purchased CFLs via mail-in rewards. Because of limited survey data available for some retailers, we collapsed some retailers into a single category.¹⁴ The end result is three retailer groupings for customers who purchased CFLs via instant rewards and five retailer groupings for customers who purchased CFLs via mail-in rewards.

¹⁴ This method was also used in the 2006 database analysis and a similar 2003 analysis (Tom Talerico and Rick Winch, Glacier Consulting Group, *State of Wisconsin Department of Administration, Division of Energy, Focus on Energy Public Benefits Evaluation: ENERGY STAR® Products Program—CFL Database Analysis*, critical review by Ralph Prah, Prah and Associates, April 12, 2006 and “Demographic Comparison of CY2 Compact Fluorescent Light Bulb Purchasers by Retail Channel,” memorandum to Oscar Bloch, Wisconsin DOA, December 5, 2003).

A. INSTANT REWARDS

Table 2-14 compares year residence built and years in residence across retailers among customers who purchased CFLs via instant rewards. Customers who purchased CFLs at Mills Fleet Farm/Blain’s Farm and Fleet were less likely to live in older homes (41 percent built in 1969 or earlier compared to 58 and 50 percent). Customers who purchased CFLs at Ace/Hardware Hank/True Value were more likely to have lived in their residences for a longer period of time (58 percent since 1989 or earlier compared to 45 and 51 percent).

Table 2-14. Year Residence Built/Years in Residence—Instant Rewards

	Ace/ Hardware Hank/True Value	Menards	Mills Fleet Farm/Blain’s Farm and Fleet	Census ¹
Year Residence Built²				
1969 or Earlier	58%	50%	41%	56%
1970–1994	33%	39%	46%	35%
1995–2000	8%	10%	13%	9%
n	469	127	70	2,321,144
Years in Residence²				
1989 or Earlier	58%	45%	51%	37%
1990–2000	42%	55%	49%	63%
n	445	120	71	2,084,544

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

² In order to compare to Census data, the table does not include the period subsequent to 2000.

Table 2-15 compares education levels and household incomes across retailers among customers who purchased CFLs via instant rewards. Customers who purchased CFLs at Mills Fleet Farm/Blain’s Farm and Fleet were less likely to have a college or advanced degree (22 percent vs. 31 and 34 percent). Customers who purchased CFLs at Menards were less likely to have incomes between \$15,000 and \$49,999 (41 percent vs. 50 and 53 percent).

Table 2-15. Education Level/Household Income—Instant Rewards

	Ace/ Hardware Hank/True Value	Menards	Mills Fleet Farm/Blain’s Farm and Fleet	Census¹
Education Level				
Not High School Graduate	3%	3%	3%	15%
High School Graduate	32%	22%	36%	35%
Some Tech/College	21%	32%	30%	21%
Tech Grad/Assoc Degree	13%	10%	10%	7%
College or Advanced Degree	31%	34%	22%	22%
n	509	157	78	3,475,878
Household Income				
Less than \$15,000	3%	4%	0%	13%
\$15,000–\$49,999	50%	41%	53%	44%
\$50,000–\$74,000	27%	31%	22%	23%
\$75,000 +	21%	24%	24%	20%
n	376	113	58	2,086,304

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

Table 2-16 compares household age distribution and gender across retailers among customers who purchased CFLs via instant rewards. The age distribution among households of customers who purchased CFLs at Menards is less likely to be comprised of individuals in the 66 or older age range (12 percent vs. 21 percent each). Menards also has a lower proportion of males comparatively (56 percent vs. 60 and 64 percent).

Table 2-16. Household Age Distribution/Gender—Instant Rewards

	Ace/ Hardware Hank/True Value	Menards	Mills Fleet Farm/Blain's Farm and Fleet	Census ¹
Household Age Distribution²				
17 or Younger	20%	25%	19%	26%
18 to 65	59%	62%	60%	61%
66 or Older	21%	12%	21%	13%
n	525	158	81	5,363,675
Gender				
Male	60%	56%	64%	49%
Female	40%	44%	36%	51%
n	538	164	84	5,363,675

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

² Census data for these categories are 18-64 and 65 or older.

B. MAIL-IN REWARDS

Table 2-17 compares year residence built and years in residence across retailers among customers who purchased CFLs via mail-in rewards. Customers who purchased CFLs at Mills Fleet Farm/Blain’s Farm and Fleet were more likely to live in older homes (55 percent built in 1969 or earlier compared to 41–44 percent). Interestingly, the opposite was true for customers who received instant rewards for CFLs purchased at Mills Fleet Farm/Blain’s Farm and Fleet (41 percent built in 1969 or earlier). Customers who purchased CFLs at Home Depot and Menards were more likely to have lived in their residences for a shorter period of time (54 percent each since 1990 vs. 33–46 percent). Customers who purchased CFLs at Independents were more likely to have lived in their homes for a longer period of time (67 percent since 1989 or earlier vs. 46–59 percent).

Table 2-17. Year Residence Built/Years in Residence—Mail-In Rewards

	Ace/ Hardware Hank/ True Value	Home Depot	Indepen- dents	Menards	Mills Fleet Farm/ Blain’s Farm and Fleet	Census ¹
Year Residence Built²						
1969 or Earlier	44%	44%	43%	41%	55%	56%
1970–1994	45%	44%	49%	48%	41%	35%
1995–2000	11%	11%	8%	11%	4%	9%
n	36	97	53	244	49	2,321,144
Years in Residence²						
1989 or Earlier	54%	46%	67%	46%	59%	37%
1990–2000	46%	54%	33%	54%	41%	63%
n	39	83	46	218	46	2,084,544

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

² In order to compare to Census data, the table does not include the period subsequent to 2000.

Table 2-18 compares education levels and household incomes across retailers among customers who purchased CFLs via mail-in rewards. Customers who purchased CFLs at Mills Fleet Farm/Blain's Farm and Fleet were less likely to have a college or advanced degree (29 vs. 39–44 percent). This was also the case for customers who received instant rewards for CFLs purchased at Mills Fleet Farm/Blain's Farm and Fleet (22 percent). Customers who purchased CFLs at Mills Fleet Farm/Blain's Farm and Fleet were more likely to have incomes in the \$15,000–\$49,999 range (60 percent vs. 37–46 percent). Also, customers who purchased CFLs at Home Depot were more likely to have incomes of \$75,000 or more (41 percent vs. 11–34 percent). Finally, customers who purchased CFLs at Ace/Hardware Hank/True Value were less likely to have incomes of \$75,000 or more (11 percent). The same was true for customers who received instant rewards for CFLs purchased at Ace/Hardware Hank/True Value (21 percent).

Table 2-18. Education Level/Household Income—Mail-In Rewards

	Ace/ Hardware Hank/ True Value	Home Depot	Indepen- dents	Menards	Mills Fleet Farm/ Blain's Farm and Fleet	Census ¹
Education Level						
Not High School Graduate	0%	0%	2%	5%	6%	15%
High School Graduate	24%	27%	32%	32%	45%	35%
Some Tech/College	34%	20%	17%	14%	14%	21%
Tech Grad/Assoc Degree	0%	9%	7%	10%	6%	7%
College or Advanced Degree	42%	44%	43%	39%	29%	22%
n	38	107	54	279	49	3,475,878
Household Income						
Less than \$15,000	7%	0%	0%	5%	0%	13%
\$15,000–\$49,999	43%	37%	46%	40%	60%	44%
\$50,000–\$74,000	39%	22%	20%	22%	16%	23%
\$75,000 +	11%	41%	34%	32%	24%	20%
n	28	85	50	219	25	2,086,304

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

Table 2-19 compares household age distribution and gender across retailers among customers who purchased CFLs via mail-in rewards. The age distribution among households of customers who purchased CFLs at Home Depot is less likely to be comprised of individuals in the 66 or older age range (7 percent vs. 15–34 percent). On the other hand, the age distribution among households of customers who purchased CFLs at Ace/Hardware Hank/True Value is more likely to be comprised of individuals in the 66 or older age range (34 percent), meaning that these customers are more likely to be retired, which explains why customers who purchased CFLs at Ace/Hardware Hank/True Value were least likely to have incomes of \$75,000 or more (see Table 2-18). Customers who purchased CFLs at Ace/Hardware Hank/True Value were more likely to be female (58 percent vs. 20–38 percent). Customers who purchased CFLs at Home Depot were more likely to be male (80 percent).

Table 2-19. Household Age Distribution/Gender—Mail-In Rewards

	Ace/ Hardware Hank/ True Value	Home Depot	Indepen- dents	Menards	Mills Fleet Farm/ Blain's Farm and Fleet	Census ¹
Household Age Distribution²						
17 or Younger	20%	27%	23%	26%	28%	26%
18 to 65	46%	66%	60%	59%	45%	61%
66 or Older	34%	7%	17%	15%	27%	13%
n	38	109	54	283	53	5,363,675
Gender						
Male	42%	64%	80%	63%	62%	49%
Female	58%	36%	20%	37%	38%	51%
n	41	108	54	297	52	5,363,675

¹ Source: US Census Bureau. Profile Characteristics: 2000. Geographic Area: Wisconsin.

² Census data for these categories are 18-64 and 65 or older.