

ENERGY STAR Residential Lighting

Market Progress Evaluation Report, No. 2

prepared by

ECONorthwest

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Residential Lighting Program Final Market Evaluation Progress Report

A Report to the
Northwest Energy
Efficiency Alliance

ECONorthwest

ECONOMICS • FINANCE • PLANNING

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Acknowledgements

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EXECUTIVE SUMMARY

INTRODUCTION

This report is the final market progress evaluation report (MPER) of the Northwest Energy Efficiency Alliance's (the Alliance's) ENERGY STAR Residential Lighting Program (Lighting Program). The Lighting Program promotes residential lighting products that meet ENERGY STAR technical lighting specifications and are labeled with the ENERGY STAR logo. Targeted lighting technologies include screw-based compact fluorescent lamps (CFLs), indoor and outdoor fixtures, and portable lamps. The program is part of an ongoing effort to transform the residential lighting market in the Pacific Northwest. It is implemented by ECOS Consulting, Inc. (ECOS) over the four-state Alliance territory. This incarnation of the Lighting Program ended in December 2003, but Alliance residential lighting program efforts are continuing through the Residential Sector Initiative, which formally began in March 2004.

This MPER is the second and last written for this program and covers the period January 2002 through December 2003.

PROJECT BACKGROUND AND APPROACH

Originally, there were two separate residential lighting programs, ENERGY STAR Fixtures and LightWise Bulbs, both approved by the Alliance Board of Directors in June 1997 and implemented through June 2000. These programs focused on manufacturers, encouraging them to increase the availability of high efficiency lighting products and to reduce their prices. Financial incentives were offered to manufacturers to help achieve these goals. This strategy was extremely successful in introducing efficient lighting products into the marketplace and in establishing a strong relationship between manufacturers, retailers, and the Alliance Program.

The two programs were combined into one in July of 2000 and a decision was made to support only ENERGY STAR qualified or labeled products. The program's focus shifted to retailers, by providing training, product information, and advertising and marketing support to salespeople. The program premise was that acceptance of high efficiency residential lighting products would be helped by the increasing visibility of the ENERGY STAR brand in local retail outlets, where consumers could easily acquire both information and the products themselves. Direct advertising and rebates to consumers were explicitly excluded from the program both because of the cost and the Alliance Board's belief that it would be premature to appeal directly to consumers prior to having a strongly established presence among retailers.

Specific objectives of the project include:

- Encourage consumers to purchase new generation ENERGY STAR CFLs;
- Encourage the development and enhancement of market conditions for residential ENERGY STAR lighting fixtures;
- Leverage local utility support for retail program efforts; and
- Encourage improvement of ENERGY STAR product quality.

Beginning in 2004, the Lighting Program became integrated with the broader Residential Sector Initiative (Initiative) developed by the Alliance. Within this Initiative, the Lighting Program will continue utilizing many of the same tools that have been used effectively to date, but will expand to include the new construction market (through the ENERGY STAR Homes Northwest Program included in the Residential Sector Initiative).

MARKET PROGRESS INDICATORS

Progress indicators identified at the outset of the program reflect the consumer/retail focus of the current effort. These indicators – along with a brief assessment on program performance for each – include:

1. Increased consumer awareness of ENERGY STAR products and benefits of purchasing energy efficient lighting products.

Evaluation Finding: Consumer awareness is very high and has been sustained over time, as measured in several waves of consumer surveys. In addition, the vast majority of retailers surveyed indicated that consumer knowledge of CFLs has increased and that this increase is attributable to the Lighting Program.

2. Increasing the number of manufacturers producing ENERGY STAR qualified residential lighting products.

Evaluation Finding: Beginning after the energy crisis, it was decided that a consumer focus for this evaluation was the most useful approach. Consequently the evaluation focused on the overall availability of CFLs rather than the number of manufacturers producing CFLs. As a result, this indicator was not tracked in the evaluation.

3. Increases in the number of retail stores in the Northwest that regularly stock ENERGY STAR lighting products.

Evaluation Finding: The number of retailers stocking CFLs has increased since the start of the program, as determined by the market assessment conducted in this evaluation and the number of participating retailers as reported by ECOS.

4. Increases in the variety of products (indoor, outdoor, torchieres) available to each market segment (homebuyers and volume builders) throughout the region.

Evaluation Finding: The variety of CFL products has increased from the start of the program, and it appears that this variety will be maintained at least in the near term. In two surveys, the vast majority of retailers we talked to (over 80 percent) indicated that they planned to either increase or maintain the number of brands and models of CFLs they carry.

5. Retailers showing a preference for program products through in-store promotions, shelf placement, or feedback to manufacturers.

Evaluation Finding: Retailers we surveyed indicate that they plan to either maintain or increase the CFL promotions they conduct in the upcoming year. In the latest retailer

survey (conducted in Spring 2003), 85 percent of the retailers expected their CFL promotions to either increase or stay the same in the next year.

6. Prices of ENERGY STAR-qualified products dropping below pre-program levels.

Evaluation Finding: Prices consumers pay for CFLs have fallen steadily during the course of this evaluation and are well below pre-program levels. In the 2003 consumer survey, 48 percent of CFL purchasers reported paying \$6 or less for their CFLs, compared to only 20 percent in the 2002 survey.

7. Increase in the market share of ENERGY STAR units shipped to retailers and purchased by consumers in the Northwest.

Evaluation Finding: Market share for CFL sales has increased since the program inception. Prior to 2000, market share for CFLs was essentially zero and has increased to about 9 percent in 2002 and 2003 within the program territory. (The evaluation focused on market share of CFL sales to consumers and did not track market share for CFL shipments to retailers.)

EVALUATION APPROACH

This MPER employed three primary data collection components to evaluate the program's progress:

- **Market Assessment**

This analysis uses retailer sales data collected by ECOS and estimates quarterly CFL sales for all retailers in the program territory using a sales estimation model developed by ECONorthwest.

- **Retailer Survey**

In May 2003, ECOS program field staff administered a short written survey to approximately 130 participating retailers. Survey topics included market trends, stocking practices, and general perceptions of the CFL market. The survey instrument was the same as that used in 2002 to allow for an analysis of trends.

- **Consumer Surveys**

A third wave of lighting purchaser surveys were fielded in April 2003 to assess consumer awareness, perceptions, and CFL purchase and installation behaviors. Over 750 surveys were completed with a random population of recent lighting purchasers, and over 500 "callback" interviews were completed with respondents from Wave II and Wave I to understand their satisfaction and behavior over time.

The analysis methods and results for each of these tasks are summarized below.

MARKET ASSESSMENT APPROACH AND RESULTS

One of the primary objectives of the evaluation was to develop mechanism for tracking CFL sales in order to provide an overall assessment of the CFL market over time. This assessment relies on available CFL sales and market data, as well as information obtained from the consumer and retailer surveys. The objectives of the market assessment are to:

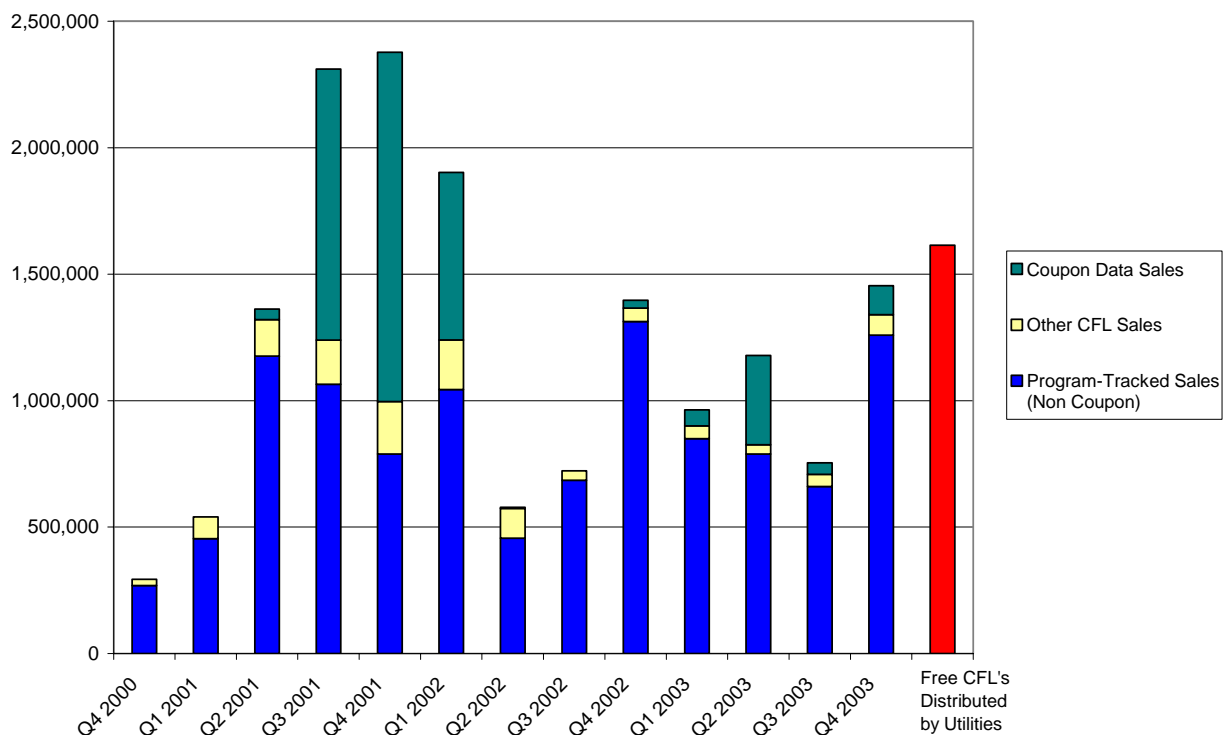
- Develop a picture of overall CFL sales within the program territory;
- Estimate CFL sales occurring outside program channels; and
- Evaluate the sustainability of observed CFL sales trends.

The figure below shows CFL sales within the region by quarter as developed in the CFL sales database. Since Quarter 4 of 2000, total CFL sales are estimated at 15,834,900 for the Lighting Program territory. In addition to promoting CFL sales, some utilities within the Alliance Territory also had campaigns in which free CFLs were mailed directly to customers over the same time period (mostly at the height of the energy crisis.) Information on the total number of free CFLs bulbs distributed by the utilities was collected by ECOS. When these sales are combined with the 1,614,257 free CFLs distributed in the region by the utilities, the total number of CFLs reaching customers (both through the Lighting Program and through non-program channels) is estimated at 17,449,157 since the fourth quarter of 2000.

Current Market Assessment of Regional CFL Sales and Free CFLs

Quarter	Coupon Data Sales	Program-Tracked Sales (Non Coupon)	Other CFL Sales	Total CFL Sales
Q4 2000	0	268,717	25,046	293,763
Q1 2001	0	454,678	85,259	539,937
Q2 2001	41,286	1,176,186	144,696	1,362,168
Q3 2001	1,071,357	1,065,263	174,225	2,310,845
Q4 2001	1,381,927	789,193	206,795	2,377,915
Q1 2002	662,421	1,044,325	195,505	1,902,251
Q2 2002	4,207	456,025	118,096	578,328
Q3 2002	348	684,790	37,267	722,405
Q4 2002	30,721	1,313,043	52,847	1,396,612
Q1 2003	63,111	850,167	50,046	963,324
Q2 2003	353,234	788,879	36,345	1,178,458
Q3 2003	45,689	660,493	48,392	754,575
Q4 2003	114,301	1,259,102	80,916	1,454,319
Total	3,768,602	10,810,862	1,255,436	15,834,900
Free CFL's distributed by utilities				1,614,257
Total CFL's				17,449,157

CFL Sales by Quarter and Free CFLs Distributed



The market assessment shows that the CFL sales have been consistently robust throughout the period covered by this evaluation. While there was an expected decrease once the Coupon Campaign¹ ended, sales have remained strong and have not returned to their pre-program or pre-energy crisis levels. This trend provides an encouraging sign that CFL sales may be sustained in the long term.

SURVEY APPROACH AND RESULTS

During the spring of 2002 and 2003, two types of surveys of residential lighting customers were fielded. The first survey type was a general consumer survey and asked a representative sample of residential customers in the program area about their lighting purchases. The second type of survey was a ‘call back’ survey, in which lighting purchasers from earlier survey waves were called back the following year and asked about CFL satisfaction, persistence, and the type of lighting purchases made in the period following the initial survey contact.

The goal of both the general lighting survey and the call back survey is to gather information on:

¹ In response to the energy crisis, the Bonneville Power Administration created an ENERGY STAR Coupon Campaign (Coupon Campaign), with strong support from Eugene Water and Electric Board and Portland General Electric. The Coupon Campaign was based on a fulfillment house concept in which utilities wishing to participate ordered coupons through a central clearinghouse operated by ECOS Consulting. Retailers sent redeemed coupons back to ECOS, which then paid the participating retailers for each coupon received. More information about this program is available in MPER #1.

- Demographics of CFL purchasers;
- Consumer awareness of CFLs;
- CFL purchase drivers and barriers;
- CFL installation/purchase rates;
- Consumer satisfaction with CFL bulbs; and
- Influence of CFL experience on subsequent lighting purchases.

In addition to the consumer surveys, the evaluation developed a retailer survey that was fielded in 2002 and 2003 by the Lighting Program field staff during their normal visits to retailers. These surveys provided a different perspective on the market and provided another data source to help corroborate findings from the consumer survey and market assessment.

The consumer surveys highlighted important satisfaction issues and identified key factors that contributed to consumers switching back to incandescents after trying CFLs. In particular, the most often cited reasons for returning to incandescents were dissatisfaction with light color and brightness. Early bulb burnout seemed to be less of a factor influencing CFL satisfaction levels or causing customers to return to incandescents. However, if early burnout problems persist, it will almost certainly become a customer satisfaction and repeat purchase issue – particularly given that longer bulb life is often cited as a CFL benefit. Despite these issues, consumer-stated intentions for purchasing CFLs in the future remain relatively high.

The retailer survey showed positive signs that retailers have embraced CFLs and are likely to continue stocking them in the near future. Retailers indicated that stocking levels for ENERGY STAR CFLs would either increase or stay the same relative to the prior year. Similarly, the variety of ENERGY STAR CFLs offered is anticipated to stay the same or increase in the upcoming year, according to retailers. Retailers also indicated that consumers are showing greater awareness of ENERGY STAR CFLs and of the ENERGY STAR label in general, which retailers attributed to Lighting Program efforts.

The results of these evaluation activities are described in detail in the main part of this report. Chapter 1 provides an overview of the Residential Lighting Program implementation occurring in 2002 and 2003. Chapter 2 provides a brief overview of evaluation activities over this same period. Chapter 3 presents the market assessment and information on quarterly CFL sales. Chapter 4 presents the results of the consumer surveys conducted in 2002 and 2003. Chapter 5 presents similar comparative results for the retailer surveys conducted in 2002 and 2003. Chapter 6 reviews the assumptions underlying the Alliance’s cost-effectiveness model for this program. Finally, Chapter 7 presents the evaluation conclusions and recommendations for the Lighting Program moving forward. The consumer survey instruments are provided as an appendix to the main report. Detailed results from the retailer survey are also included as a separate appendix.

EVALUATION CONCLUSIONS AND RECOMMENDATIONS

The Lighting Program has continued its strong performance in 2002 and 2003, despite the phasing out of the Coupon Campaign and a lessening of concern regarding energy supplies and prices as the energy crisis subsided. Based on the evaluation results presented in this report, we draw the following general conclusions.

- *The market for CFLs has not been transformed.* Significant progress toward some of the CFL market goals has been achieved and positive market effects for CFLs have been observed. As discussed below, awareness of CFLs is very high and CFL sales have continued to be strong despite the end of BPA's Coupon Campaign and the energy crisis. Despite these achievements, however, it is still too early to claim that the market for CFLs has been transformed. Although the majority of CFLs purchased are still installed, the consumer survey data show a general decline in consumer satisfaction with CFLs, and that the majority of CFLs removed have been replaced by incandescent bulbs. Significant barriers to initial and repeat purchases such as price, light quality, and compatibility with fixtures still need to be addressed and future program efforts should continue to focus on these areas.
- *Consumers do not associate the ENERGY STAR label with CFLs at the levels observed for other ENERGY STAR products.* Just under half of the retailers we surveyed in 2002 and 2003 indicated that customers were asking specifically for ENERGY STAR products, and these were surveys of retailers that are actively involved with the Lighting Program. In addition, the results of the Northwest sample from the Consortium for Energy Efficiency (CEE) national ENERGY STAR survey in Fall 2003 indicates that ENERGY STAR brand recognition for CFLs is lagging behind other products. In the Northwest, 28 percent reported having seen the ENERGY STAR label on a CFL, which is significantly higher than the 17 percent national average. Nevertheless, recognition for the Energy Star label for other appliances is much higher, with refrigerators at 60 percent, clothes washers at 55 percent, dishwashers at 51 percent, and computers at 42 percent. In addition, when asked "in the future, if you needed to buy a light bulb, how important would it be for you to buy one with an ENERGY STAR label?", 21 percent of respondents in the CEE survey say "Very important" compared with 34 percent for appliances. Similarly, 40 percent said that this was "Slightly important" or "Not at all important" for lighting, compared with only 23 percent for appliances.

These responses indicate that there is still work to be done in getting consumers to make the link between CFLs and the ENERGY STAR brand. Given the issues with product quality and consumer dissatisfaction, it is very important that the ENERGY STAR brand management team work to improve the products that it labels, particularly in terms of light quality and lumen depreciation.

- *CFL sales remain strong and have been sustained for several quarters following the energy crisis.* Even in the absence of an immediate concern for energy supplies and without a widespread coupon campaign, CFL sales remained strong in 2002 and 2003. This sustained CFL sales volume suggests that higher levels of CFL sales can be sustained as retailers and consumers both begin to embrace CFLs. Based on the

estimated CFL sales and total lamp sales for the program territory, we estimate that market share for CFLs is about 9 percent for 2002 and 2003.

- *Consumer awareness of CFLs remains high.* Given the high levels of CFL sales, it is not surprising that consumer awareness of ENERGY STAR CFLs has remained high, as confirmed through all three waves of the consumer survey. Retailers interviewed as part of the retailer surveys also indicated that consumer awareness has increased and that more customers are actively seeking ENERGY STAR lighting. This is encouraging for the long-term outlook for sustainable CFL sales and corresponds to one of the market progress indicators set for this program.
- *Overall consumer satisfaction with CFLs has declined over the program period.* CFL purchaser satisfaction ratings have shown progressive erosion since the first consumer survey was conducted in 2001. Although approximately 80 percent of CFL purchasers rate their satisfaction at 6 or higher on a 10-point scale, the proportion rating their satisfaction as a 9 or 10 has declined from 46 percent in 2001 to 29 percent in 2003. This finding underscores the critical importance of continued support for product quality testing and assurance programs.
- *Issues with light quality and dimness are causing some to switch back to incandescents.* Although based on very small survey sample sizes, it appears that CFL purchasers who have problems with light brightness or color are switching back to incandescents. While consumers appear to have been somewhat tolerant of CFL burnouts, this is not the case with light quality issues. Fortunately, this is an issue that the program is well positioned to address and has already taken steps in this direction through its newly designed Retailer Pocket Guide and its support of PEARL quality testing efforts.
- *CFL lamp burnouts appear to be less of an issue than light quality.* The lighting purchaser callback surveys show that CFL purchasers that have CFLs that burn out early are still purchasing CFL bulbs as replacements, although some are returning to incandescents. In addition, our callback surveys indicate that removals due to burnouts have been decreasing. Despite anecdotal evidence regarding high rates of CFL burnouts, this does not appear to be negatively affecting purchases in the short run. There is no reason to believe, however, that tolerance for burnouts will continue in the long term, as consumers that have repeated experiences with early bulb failures are likely to become frustrated with the product and switch back to incandescents.
- *Retailers are increasing or maintaining the levels and varieties of ENERGY STAR CFLs that they carry.* Both retailer survey waves show that retailers were planning to either increase or maintain the ENERGY STAR CFLs that they carry – both in number and variety. This indicates that lighting stocking practices promoted by the program are being sustained at least in the short run, which is one of the measures of market progress for this program.

Given these findings and the evaluation results included in this report, we make the following recommendations for the Lighting Program and the evaluation moving forward.

- *Increase program efforts to mitigate CFL lumen depreciation and to educate consumers on CFL color and brightness issues.* The lighting purchaser surveys show a disturbing decline in consumer satisfaction with CFLs. Consumers have consistently cited light quality and brightness issues as a primary source of dissatisfaction with CFLs, which can be the result of inaccurate wattage conversion charts or lumen depreciation over time. Moreover, lighting quality issues seem to have a long-term detrimental effect on repeat purchase of CFLs, causing some consumers to switch back to incandescents. Program efforts should continue to address these problems by increasing the use among retailers of lighting displays, accurate wattage conversion charts, and lighting color guides. In conjunction with this, the program should provide support for quality control activities (such as PEARL testing) that are working toward addressing lumen depreciation.
- *Expand CFL promotional efforts to grocery stores.* The consumer survey shows that one of the reasons why incandescents are purchased instead of CFLs is out of habit, which was cited by 26 percent of the respondents in the latest call back survey as to why they returned to purchasing incandescents after buying a CFL. The Wave I consumer survey also shows that 35 percent of respondents tend to purchase light bulbs at grocery stores, which are frequented far more often than the types of stores currently targeted by the program. Encouraging more grocery stores to carry ENERGY STAR CFLs will help reach these consumers.
- *Utilize the consumer surveys to estimate CFL sales within the program territory.* While ECOS has been exceptional at collecting CFL sales data from retailers, it is limited to those retailers that agree to provide them data and does not account for retailers that are outside the reach of the program. If program resources (and therefore ECOS data collection efforts) remain relatively constant while the number of retailers stocking CFLs and not providing sales data increases (as we would expect if consumers continue to demand CFLs), then by definition the overall share of the market covered by the data ECOS collects will likely fall.

For future evaluations, we recommend that a consumer survey sample utilizing a slightly larger sample be fielded and the survey results used to estimate CFL sales and market share for the program territory. This method likely will yield more accurate estimates of total CFL sales than the current system and will provide an independent check of the CFL sales numbers being collected as part of the program implementation.

- *Increase the callback survey sample.* By increasing the sample size of the general consumer survey, the evaluation should also be able to reach more respondents through the callback surveys. This will allow for a more robust sample that can be used to determine trends in CFL purchases with more certainty. This is particularly important for understanding the reasons why consumers try CFLs and then switch back to incandescents in subsequent purchase occasions.
- *Continue efforts to track and mitigate early CFL burnouts.* The evaluation surveys indicate that consumers are currently tolerant of CFL bulbs that burn out early and are tending to stay with CFLs. There is no reason to believe that this trend should continue, however, and repeated experiences with burnouts will likely cause consumers to switch

back to incandescents. The Lighting Program should continue collecting burnout data through the Report Cards and work to increase retailer responses. Continued support of PEARL testing should also be a priority for the Lighting Program moving forward.

- *Dedicate additional resources to track pivotal cost-effectiveness model assumptions.* This was not a priority for the current evaluation and only lately has this become more of an issue with the publication of the Retrospective report of Alliance programs. We recommend future evaluation research include an effort to determine baseline CFL sales, possibly through a survey in a baseline region that has limited exposure to CFLs. Other pivotal assumptions that should also be addressed include CFL retention and installation rates, as these impact overall energy savings calculated for the program. Determining a consistent definition of program participation for retailers will also help address the attribution issue.
- *Refine measures of market progress.* Given the widespread sales of CFLs, tracking the number of CFL manufacturers is less relevant as a measure of program progress and is less important than the overall availability of quality product. We recommend that the number of CFL manufacturers be dropped as a progress indicator for this program. Given the issues with product quality issues discussed above, we recommend that consumer satisfaction with CFLs and decreasing numbers of complaints regarding CFL brightness and light quality both be added as measures of progress for Lighting Program.

1. INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This report is the final market progress evaluation report (MPER) of the Northwest Energy Efficiency Alliance's (the Alliance's) ENERGY STAR Residential Lighting Program (Lighting Program). The Lighting Program promotes residential lighting products that meet ENERGY STAR technical lighting specifications and are labeled with the ENERGY STAR logo. Targeted lighting technologies include screw-based compact fluorescent lamps (CFLs), indoor and outdoor fixtures, and portable lamps. The program is part of an ongoing effort to transform the residential lighting market in the Pacific Northwest. It is implemented by ECOS Consulting, Inc. (ECOS) over the four-state Alliance territory. This incarnation of the Lighting Program ended in December 2003, but Alliance residential lighting program efforts are continuing through the Residential Sector Initiative, which formally began in March 2004.

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Progress indicators identified at the outset of the program reflect the consumer/retail focus of the current effort. They include:

- Increased consumer awareness of ENERGY STAR products and benefits of purchasing energy efficient lighting products;
- Increasing the number of manufacturers producing ENERGY STAR qualified residential lighting products;
- Increases in the number of retail stores in the Northwest that regularly stock ENERGY STAR lighting products;
- Increases in the variety of products (indoor, outdoor, torchieres) available to each market segment (homebuyers and volume builders) throughout the region;
- Retailers showing a preference for program products through in-store promotions, shelf placement, or feedback to manufacturers;
- Prices of ENERGY STAR-qualified products dropping below pre-program levels; and
- Increase in the market share of ENERGY STAR units shipped to retailers and purchased by consumers in the Northwest.

1.4 PROGRAM ACTIVITIES

This MPER focuses on general CFL market issues and does not evaluate the activities of the program itself. This section is provided as background for readers interested in a more detailed understanding of the structure and activities of the ENERGY STAR[®] Residential Lighting Program.

As the Lighting Program shifted from upstream, manufacturer incentives to a retail-based strategy, it was imperative to address the needs of a variety of retail players in the market. A market analysis was therefore performed during the program planning process and four primary channels were identified: Do-It-Yourself or “DIY” (e.g., Home Depot, Lowe's); Mass Merchandisers (e.g., Wal-Mart, Costco); Hardware (small regional chains such as Thurman’s and Penguins and independents such as Ace and True Value); and Lighting Specialty (e.g., World Lighting, Lamps Plus). As the similarities between some store types emerged as the program matured, these categories were collapsed into two broader channels: “DIY/Mass Merchandiser” and “Hardware/Specialty”.

The Lighting Program addresses these market channels with five broad categories of activities:

- Field Support
- Cooperative Marketing Fund
- Promotions
- Websites
- Coordination with National Programs

Details on specific activities within these categories are described in the remainder of this section.

Field Support

Field services are the heart of the Lighting Program and field service representatives (field reps) create and maintain the retailer and utility relationships that allow all program activities to function effectively. They help introduce the concept of energy-efficient lighting and assist local lighting retailers and electric utilities in promoting the sale of ENERGY STAR lighting products. The Lighting Program has a team of trained field reps covering Idaho, Montana, Oregon, and Washington. ECOS has subcontracted with Applied Proactive Technologies, Inc. (APT) to provide field services in Eastern Washington, Idaho, and Montana.

Each of the field representatives is assigned a service territory so that he or she gets to know individual retailers and utility staff members and develop long-term relationships with them. A typical retailer or utility visit takes between 15 and 60 minutes. The number of visits that can be made in a day varies greatly with the size and population density of the service territory. At small retailers, the field representative will typically try and speak with the owner. At larger retailers, the lighting or department manager will be contacted. If the owner or department manager is not available, the field representative may talk with a sales clerk. A higher priority is given to visiting retailers participating in cooperative marketing agreement. Specific field rep activities include:

- Enlistment of retailers to sign ENERGY STAR Retail Agreements;
- Retailer training;
- On-going retailer support including point-of-purchase material placement and merchandising assistance;
- Supporting special projects and other cooperative retail efforts;
- Labeling ENERGY STAR products that require identification;
- Consumer education through in-store demonstrations; and
- Data collection- including manufacturer, product, and price of ENERGY STAR CFLs.

Activities related to utilities include:

- Regular visits to utility representatives when visiting retailers in their area;
- Providing utility representatives with the opportunity to visit retailers and attend retailer training and in-store promotions led by field representatives;

- Providing utility training for specific program-sponsored events and promotions;
- Training utility staff that may be interested in performing fieldwork themselves; and
- Material support at utility outreach events such as fairs, home shows, and trade shows.

Field reps originally provided a Retailer Resource Kit that contains information on both the program and ENERGY STAR and was designed for use by retailers and utility staff. There are seven main sections in the kit that cover all aspects of the program: Program Overview, ENERGY STAR, Compact Fluorescent Bulbs, Hardwired Fixtures, Torchiere Floor Lamps, Cooperative Marketing Funds, Point-of-Purchase materials. The Resource Kit was replaced in 2002 by the Retailer “Pocket Guide”, which is more compact and consequently easier to use as retailers can carry it in an apron or have it on the counter near the cashier. The Pocket Guide provides information on lighting color and the correct CFL choices for various applications.

Table 1 shows the level and type of field rep activities for 2002 and 2003. Activity levels in all areas increased in 2003 relative to 2002. In addition to increases in activity for existing tasks, utility trainings were added as an activity in 2003.

Table 1: Field Rep Activities 2002-2003

	Retailer Visits	Retailer Trainings	Utility Visits	Utility Trainings	Outreach / Coop Events
2002	1,468	23	173	NA	64
2003	3,832	167	295	28	104

Finally, field representatives serve as the eyes and ears of the program, gathering as much qualitative and quantitative information on retailers and their products as possible. ECOS has been refining its data collection process in an effort to generate consistent data across retailers. Currently, some retailers are directly providing ECOS with detailed sales and inventory data that come from company databases. In other cases, retailers do not maintain these data or prefer not to distribute them. Except when required as part of a coop agreement, it is up to each retailer to decide whether they provide sales data to ECOS. The extent that data are provided is determined largely by each retailer’s interest in the Lighting Program.

In addition to field reps, the Lighting Program has also provided field assistance through several other mechanisms. Due to the large number of CFLs sold, the Lighting Program has created a system to track CFL failures (both ENERGY STAR and non-ENERGY STAR models combined) and other reliability issues at the retailer level. To accomplish this, the program has created the CFL Report Card as an early warning system to track CFL failures. For 2003, the report volume received by the Program was steady, but lower than 2002, especially towards the last quarter. This was possibly due to a combination of low or depleting card supply, lessened awareness, and decreasing product prices. Analysis of data by ECOS is helping to create a baseline for product quality and has provided feedback for PEARL product testing selection. The data from the CFL Report Card indicate so far that no excessive failures of any one product model or brand occurred in 2003.

The Lighting Program also created a CFL Disposal Kit in 2003 that is intended to help utilities understand the CFL disposal issue by reviewing the role of mercury in fluorescent lamps and addressing some of the confusion caused by some media coverage shortly after the 2001 energy crisis. The Disposal Kit offers options, tools and resources for utility participation in promoting proper CFL disposal. The Lighting Program has also found it necessary to frequently update the Kit when new information becomes available and it is currently in its fourth edition.

In addition to the CFL Disposal Kit, the Lighting Program has also provided support for those utilities involved in the development of a CFL recycling program. Utilities actively involved in this effort include those in the Puget Sound area (Puget Sound Energy, Seattle City Light, and Tacoma Power) and the Eugene, OR vicinity (EWEB leading, with EPUD participating as well). Both programs are still under development and are anticipated to launch in mid-2004 for a six- to twelve-month pilot. The Lighting Program is assisting with program messaging and will help with retailer and manufacturer communications.

Cooperative Marketing Agreements

Recognizing that each of the retail channels is driven by different needs and constraints, the Lighting Program established Cooperative Marketing Agreements as a means for supporting retailers in selling ENERGY STAR CFLs. These agreements provide funds to individual teams of retailers and manufacturers that submit applications, and are awarded by ECOS based on the quality of the proposals submitted. Virtually all agreements use some combination of the following materials and activities:

- Header Boards
- Point-of Purchase materials
- CFL Sales Data Reporting
- Advertising
- End Caps
- Sweepstakes
- Displays

The amount of funding allocated to each agreement is determined by the specific needs outlined in a proposal, the amount of matching funds contributed by the proposers, and the market channel that the proposal team represents. When funds first became available, the Lighting Program mailed out an invitation to apply for funds to all participating retailers and manufacturers operating in each channel. The invitation included information on the amount of money available, eligibility criteria, definitions of qualifying activities, an application form, a funds reservation form, a participation guideline, and a reservation confirmation.

In June 2002, 67 coop agreements had been approved for the 2001-02 funding cycle involving \$323,839 in coop funding provided by the Lighting Program. Retailers matched these funds by

providing an additional \$406,523 for the coop promotional activities. The largest share of coop dollars in 2001-02 was from the hardware and specialty store channel, with 59 retailers participating covering over 200 store locations. These stores contributed \$220,000 to the coops, achieving a 59 percent match of coop dollars provided by the Lighting Program. Coop marketing funds were also widely utilized in the 2002-03 funding cycle, with the Lighting Program leveraging over \$248,000 in coop funds. Participation in cooperative marketing by the Hardware/Specialty channel remained high, with 140 stores contributing \$172,000 to achieve a 72 percent match with coop funds provided by the Lighting Program.

Promotions

In addition to coop and field activities, the Lighting Program is also involved in a variety of promotional activities. Program promotions are structured to stimulate consumer awareness for ENERGY STAR while simultaneously reinforcing retail activity and/or establishing new relationships with partners outside the traditional arena. Promotions are also designed to establish infrastructure to support future promotional activity, making them an effective tool for jump-starting regional program efforts or introducing new products. The Lighting Program implements two types of promotional models. In the first, the Lighting Program develops a promotion concept, pilots the promotion in a select territory, and creates a “tool kit” to enable widespread implementation (e.g., individual utility coupon campaigns). In the second, the Lighting Program works with the federal ENERGY STAR program to implement national promotions in the Northwest (e.g., Change a Light, Change the World). This strategy enables the Lighting Program to take advantage of national resources, link in with a national media push, and build upon relationships with retailers and manufacturers.

The Change a Light, Change the World promotion was coordinated nationally by the US Environmental Protection Agency and spearheaded regionally by the Lighting Program in Fall 2002 and 2003. Promotion by the program for this event in 2003 focused on utilities and they were reminded and encouraged to participate in this event through multiple media channels. Despite these efforts, participation in Change a Light was less than expected and was likely due to limited resources on the part of retailers and utilities.

The Lighting Program extended its resources to lighting showrooms to help promote CFL fixtures and to help convince Northwest lighting showrooms to stock, promote and sell ENERGY STAR qualified fixtures. Program field representatives visited the national list of 26 American Lighting Association (ALA) member showrooms as well as 5 other non-ALA showrooms in the Northwest, for a total of 31 visits. Staff at these showrooms were given surveys to determine which CFL manufacturers they carried, their knowledge and interest in ENERGY STAR, and their perceptions on the major barriers to increasing sales of ENERGY STAR light fixtures. Of the 31 lighting showrooms targeted, 17 responded to the promotion and were educated on the benefits ENERGY STAR. In addition, the program conducted two fixture promotions in 2003: one with six Puget Sound area lighting showrooms and the Puget Sound utilities, and one in which the program partnered with a major DIY retailer and fixture manufacturer to introduce ENERGY STAR fixture bays in support of the fall Change A Light campaign.

Coordination with National Programs

The Lighting Program has provided assistance and resources for a variety of other national ENERGY STAR efforts. The Lighting Program has been a regular participant in meetings of the Consortium of Energy Efficiency (CEE), which has the primary role of coordinating comments from regional ENERGY STAR partners on changes in the ENERGY STAR specifications. The Lighting Program has also assisted with the development of the Program for Evaluation and Analysis of Residential Lighting (PEARL), a national effort funded by regional ENERGY STAR partners responsible for conducting independent testing of CFLs to ensure compliance with ENERGY STAR specifications. The Lighting Program has helped fund the PEARL initiative and the field reps in the Lighting Program have pulled CFL bulb samples off store shelves for testing as part of the PEARL effort.

The Lighting Program also began working with Habitat for Humanity in 2002 to encourage the installation of CFLs in the homes they build. The Lighting Program also developed a Habitat for Humanity Partnership Guide to help utilities develop and coordinate their own promotions with Habitat for Humanity.

Websites and Listserv

There are several websites that help to promote the Lighting Program's goals.

Lightsite.net

The website lightsite.net is used in the Lighting Program both as a means of disseminating program information to retailers and utilities and as a tool for providing consumers with the location of participating stores. Utilities and retailers can subscribe to the lightsite.net listserv, which provides periodic updates on program activities. Utilities are also able to access CFL sales data for promotions within their territories.

BetterBulbsDirect.com

The Lighting Program also created BetterBulbsDirect.com, a website designed to provide a wholesale outlet for new and innovative sub-compact CFLs. Website development was directed by Battelle Pacific Northwest National Laboratory (PNNL), with assistance from ECOS staff and ECONorthwest.

Lightingplans.com

This website is designed for new homebuilders and provides several home designs that utilize ENERGY STAR CFLs and fixtures.

In addition to these websites, the Lighting Program has created *ebulletin*, which is a listserv email update of lighting market events and Lighting Program activities. These updates are targeted at utilities and, currently, almost 400 utilities receive the *ebulletin* on a regular basis.

2. EVALUATION APPROACH AND METHODS OVERVIEW

This chapter provides an overview of the evaluation and describes the general evaluation approach and methods used for the key evaluation activities. Details on the individual evaluation components are provided in subsequent chapters.

2.1 CFL MARKET ASSESSMENT

One of the primary objectives of the evaluation was to develop a mechanism for tracking CFL sales in order to provide an overall assessment of the CFL market over time. This assessment relies on available CFL sales and market data, as well as information obtained from the consumer and retailer surveys. The objectives of the market assessment are to:

- Develop a picture of overall CFL sales within the program territory;
- Estimate CFL sales occurring outside program channels; and
- Evaluate the sustainability of observed CFL sales trends.

There are multiple benefits to developing a comprehensive market assessment:

- Determining the long-term effects of the Coupon Campaign;
- Identifying market sectors that the program should consider targeting; and
- Determining the effect of other non-program events (such as the energy crisis) on overall CFL sales.

As much as possible, multiple data sources are used to confirm important analysis findings from the market assessment. Data from the consumer and retailer surveys and other evaluation activities are incorporated into the market assessment to evaluate the sustainability of current sales levels.

2.2 CONSUMER AND RETAILER SURVEYS

During the spring of 2002 and 2003, two types of surveys of residential lighting customers were fielded. The first survey type was a general consumer survey that asked a representative sample of residential customers in the program area about their lighting purchases. The second type of survey was a ‘call back’ survey, where lighting purchasers from earlier survey waves were called back the following year and asked about CFL satisfaction, persistence, and the type of lighting purchases made in the period following the initial survey contact.

The goal of both the general lighting survey and the call back survey is to gather information on:

- Demographics of CFL purchasers;
- Consumer awareness of CFLs;
- CFL purchase drivers and barriers;

- CFL installation/purchase rates;
- Consumer satisfaction with CFL bulbs; and
- Influence of CFL experience on subsequent lighting purchases.

The survey instrument was developed by ECONorthwest and Quantum Consulting and fielded by Quantum Consulting. The survey information was used in conjunction with other market information to help develop an overall picture of the residential CFL market within the Alliance territory.

In addition to the consumer surveys, the evaluation developed a retailer survey that was fielded in 2002 and 2003 by the Lighting Program field staff during their normal visits to retailers. These surveys provided a different perspective on the market and provided another data source to help corroborate findings from the consumer survey and market assessment.

3. EVALUATION RESULTS – MARKET ASSESSMENT

3.1 DATA SOURCES

Information was needed from a variety of sources to develop the market assessment. Data components include:

- A list of retailers participating in the Lighting Program
- Firmographic information on all stores in the retail population
- CFL sales data from retailers that provided it to the Lighting Program
- Coupon redemption data for both participating and nonparticipating retailers.

CFL Sales Data

CFL sales data were obtained from two different sources. First, ECOS has cultivated relationships with most of the large retailers in the territory and they have been supplying ECOS with quarterly sales information on CFLs. Second, ECOS has been collecting sales data from retailers participating in cooperative marketing agreements. However, these sales data are typically available only for the duration of the cooperative agreement and not for the entire quarter. ECOS takes these sales data and produces their own estimates of CFL sales for each quarter. The reports for the fourth quarter of 2000, and all four quarters of 2001, 2002 and 2003 were available for use in the evaluation's market assessment.

ECOS has also been tracking coupon redemption information from the Coupon Campaign and for smaller subsequent coupon campaigns sponsored by individual utilities. Coupon data that were tracked by ECOS through December 2003 was incorporated by ECONorthwest into the CFL sales database that was developed as part of the market assessment. Each redeemed coupon represents one bulb sold and identifies the retailer who redeemed it and their utility service territory. This information was combined with the other available CFL sales data and incorporated into the sales estimates for the entire market.

Retailer Information

The list of program-tracked retailers was provided by ECOS and reflects participating retailers during 2001. At that time, ECOS's definition of participating retailers involved those stores that were visited regularly by field reps or that participated in coop marketing through the Lighting Program. Since then, the stores considered as participating in the Lighting Program has expanded to include any retailer that has come in contact with the program, including those that receive mailings or phone calls and those that are primarily being reached through other local lighting programs with minimal direct assistance from the Lighting Program. Many of these stores would not be considered program participants in the traditional sense but may be actively promoting CFLs. Consequently, we do not have an accurate sense of which retailers should be considered program participants since this has not been consistently defined or tracked for the Lighting Program.

To address this issue, we have redefined the retailer definitions in the market assessment so that the distinction between ‘participating’ and ‘non-participating’ retailers has been dropped. We have kept the original set of ‘participating’ retailers from the first MPER to maintain consistency over the entire evaluation period, but sales from this group are now referred to as ‘program-tracked sales’ rather than ‘participant sales’. Similarly, what were formerly ‘non participant sales’ are now referred to as ‘non-program tracked sales’, which are estimated using the methods discussed in this section.

In order to characterize the CFL market, non-program tracked retailers that sell CFLs need to be identified. To accomplish this, Dun and Bradstreet (D&B) data were used to determine the number of retailers in the overall CFL market and to characterize these retailers by store type and size. D&B is a company that tracks businesses within SIC (Standard Industrial Classifications) codes and provides information such as store location, contact information, annual revenues, and number of employees. For larger stores (those with at least 50 employees), D&B has close to 100 percent coverage of the market.

To develop the potential market of CFL retailers, the first step was to determine the appropriate SIC codes for ECOS’ list of program-tracked stores by matching store names and addresses to D&B data. Through this matching process it was determined that the 1,060 stores tracked by the program represent twelve SIC categories. As shown in Table 2, for these 12 SIC codes the D&B data contain over 27,000 stores in the program territory.

Table 2: Population of Stores in Potential CFL Market by SIC Code

SIC	SIC Description	Program Market Channel	Program-Tracked Stores	Total Retail Stores	% of Retail Stores
5999	Misc. Retail Stores	All	113	8,024	1%
5912	Drug Stores	Hardware/ Mass Merchandisers	106	1,403	8%
5722	Household Appliance	All	1	845	0%
5719	Misc. Home Furnishings	All	10	1,340	1%
5411	Grocery Stores	Hardware/ Mass Merchandisers	68	6,730	1%
5399	Misc. General Merchandise	All	104	829	13%
5331	Variety Stores	Hardware/ Mass Merchandisers	35	571	6%
5311	Department Stores	Hardware/ Mass Merchandisers	55	709	8%
5251	Hardware Stores	All	182	1,296	14%
5211	Lumber & Other Bldg Supplies	All	342	2,380	14%
5199	Wholesale Non-Durable Goods	Hardware/ Mass Merchandisers	12	1,955	1%
5063	Elec. Apparatus & Equip	All	32	1,008	3%
Total			1,060	27,090	4%

We know, however, that not all of these 27,090 stores sell light bulbs. To address this, the original list of stores from D&B was analyzed and stores that were considered unlikely to sell light bulbs (i.e., pet stores, clothing stores, gas station convenience stores) were removed from the dataset. For the SIC codes containing relatively few stores, this was done by hand. For the Wholesale Non-Durable Goods category (SIC 5199), only Costco was kept, as it is also a retail outlet and has had a very large amount of retail CFL sales. The other stores in this category were removed to prevent double counting of wholesale and retail CFL sales.

With the preliminary non-program tracked stores established, we conducted a survey to see what percent of these stores actually sold CFLs. Our target was to interview 50 retailers within each SIC category to determine the proportion in each that sell CFLs.² As can be seen in Table 3, approximately 25 percent of the stores called in the summer of 2003 reported selling CFLs. Broken down by SIC, the percents in column (d) produce 2,530 stores that are not in the program base who sell CFLs.

Table 3: Determination of Non-participant Stores Selling CFLs

(a)	(b)	(c)	(d)	(e)	(d) x (e)
SIC Code	SIC Description	# of Stores Called	Percent of Non Program-Tracked Stores Selling CFLs	Preliminary Non Program-Tracked Population	Estimated Other CFL Sellers
5999	Misc. Retail Stores	49	12%	7,975	977
5912	Drug Stores	52	17%	1,275	221
5722	Household Appliance	50	10%	23	2
5719	Misc. Home Furnishings	49	45%	35	16
5411	Grocery Stores	50	12%	6,565	788
5399	Misc. General Merchandise	51	10%	58	6
5331	Variety Stores	50	16%	37	6
5311	Department Stores	51	41%	301	124
5251	Hardware Stores	50	46%	481	221
5211	Lumber & Other Bldg Supplies	50	22%	303	67
5199	Wholesale Non-Durable Goods	0	0%	4	0
5063	Elec. Apparatus & Equip	50	44%	236	104
Total		552	25%	17,293	2,530

Based on the results in Table 3, the entire population of stores selling CFLs (program-tracked and other retailers determined to be CFL sellers) is 3,590 as shown in Table 4. This population serves as the starting point for the CFL sales estimates discussed below.

² This involved attempting to call significantly more than 50 stores per SIC code, as many of the stores had wrong phone numbers and/or addresses. This is due to the fact that the Dun and Bradstreet data used for this market tracking system were purchased in early 2001 and were not updated since the initial purchase in order to direct evaluation resources to higher priority areas.

Table 4: Population of Stores Selling CFLs (2003)

SIC	SIC Description	Program- Tracked Stores	Estimated Other CFL Sellers	All CFL Sellers
5999	Misc. Retail Stores	113	977	1,090
5912	Drug Stores	106	221	327
5722	Household Appliance	1	2	3
5719	Misc. Home Furnishings	10	16	26
5411	Grocery Stores	68	788	856
5399	Misc. General Merchandise	104	6	110
5331	Variety Stores	35	6	41
5311	Department Stores	55	124	179
5251	Hardware Stores	182	221	403
5211	Lumber & Other Bldg Supplies	342	67	409
5199	Wholesale Non-Durable Goods	12	0	12
5063	Elec. Apparatus & Equip	32	104	136
Total		1,060	2,530	3,590

3.2 CFL SALES ESTIMATION

CFL Sales Data

With the retailer population established, it is possible to estimate total market sales using sales data for defined segments within the population. Two types of sales data are available for this exercise: (1) those collected directly from stores or corporate headquarters by ECOS staff and (2) redeemed coupons from the Bonneville Coupon Campaign and from individual utility coupon programs. (For clarity's sake, these will be referred as *program-tracked sales* and *coupon sales*, respectively.) Table 5 shows how these data sources are used to categorize the retailers for this analysis.

Table 5: Retailer CFL Sales Categories

Retailer Sales Category	Definition
Coupon Sales	CFL coupon redemptions reported to ECOS.
Program-Tracked Sales (Non Coupon)	CFL sales by retailers who report sales to ECOS, with coupon sales removed for those that use coupons and report redemptions to ECOS.
Other CFL Sales	CFL sales estimated for retailers that do not provide sales data or coupon redemption data to ECOS.

As part of its implementation of both the Lighting Program and Coupon Campaign³, ECOS was routinely collecting data for the first two categories shown in Table 5. This information is shown by quarter in Table 6. As part of the cooperative marketing agreements, retailers participating in these agreements were required to provide CFL sales data to the Alliance throughout the duration of the marketing effort. In some cases, retailers continued to provide the Alliance data after the cooperative marketing campaign ended. ECOS also established relationships with some of the larger retailers, which began providing aggregated sales data on a quarterly basis for those stores within the Alliance territory. Beginning in 2003, some stores quit providing total CFL sales data to ECOS. In these cases the program field reps collected CFL sales data from a sample of stores within the chain. Using the sample data, ECOS then extrapolated total CFL sales for that chain for the quarter.

In addition to the CFL sales data provided directly from the retailer, ECOS also administered BPA's Coupon Campaign and a series of smaller coupon campaigns for individual utilities. As part of this, ECOS processed each of the redeemed coupons and included this information in their quarterly CFL sales estimates.

³ Coupon data represents redeemed coupons that were received by ECOS from retailers. It is assumed in this analysis that each redeemed coupon represents a single CFL sale. Because most retailers only sent in coupons periodically, there may be a time lag of as long as three months between when retailers accepted a coupon at the register and when it was received by ECOS.

Table 6: CFL Coupon and Retailer Sales Data Collected by ECOS

Quarter	Coupon Data Sales	Program- Tracked Sales (Non Coupon)	Total CFL Sales
Q4 2000	0	268,717	268,717
Q1 2001	0	454,678	454,678
Q2 2001	41,286	1,176,186	1,217,472
Q3 2001	1,071,357	1,065,263	2,136,620
Q4 2001	1,381,927	789,193	2,171,120
Q1 2002	662,390	1,043,659	1,706,049
Q2 2002	3,746	409,926	413,672
Q3 2002	348	589,624	589,972
Q4 2002	30,721	1,074,824	1,105,545
Q1 2003	63,111	628,328	691,439
Q2 2003	353,234	601,393	954,627
Q3 2003	45,397	566,923	612,320
Q4 2003	104,420	1,188,258	1,292,678
Total	3,612,231	6,769,133	10,381,364

To develop a complete picture of the CFL market, CFL sales need to be estimated for the “Other CFL Sales” category in which the Lighting Program did not collect sales data. Sales were estimated for this group from available sales information using the following approach. First, a common firmographic variable was needed to extrapolate sales figures from the existing sales data. The D&B data provides both annual revenues and employees for individual stores, either of which could be used for this purpose. Revenue data, however, are often missing for stores or are included only as an aggregate number for the corporate headquarters if the store is part of a chain. Employee information, in contrast, is available for almost all stores⁴. Further, the number of store employees serves as a proxy for revenue, as stores within an SIC code with higher sales will tend to be larger and therefore have more employees. Given these advantages, number of employees was selected as the extrapolation variable.

The next step was to calculate the average CFL sales per employee per quarter for program participants with available retailer sales data. The CFL sales excluded those purchased with coupons, as the purpose was to extrapolate to stores where coupons were not accepted. In order to make the estimate as accurate as possible, separate averages were calculated for each unique state/region type/SIC combination.⁵ These averages were then multiplied by the number of employees at the stores without sales data to estimate retailer sales.⁶

⁴ In those cases where information on the number of employees was not available in the D&B data, the average number of employees was assigned for stores within the same State/Geography/SIC Code.

⁵ The specific definitions for the urban, rural, and suburban categories are the same as those used for the consumer survey and are discussed in detail in that section of the report.

⁶ In those instances where there were no retailers with sales within a particular State/Geography/SIC Code segment, it was assumed that nonparticipant non-coupon CFL sales were zero. This is based on the assumption that the lack of retailers with sales data is a good indication that there are no CFLs being sold through that particular channel except possibly through the Coupon Campaign, which is accounted for in the assessment.

One drawback of this approach is that it implicitly assumes that there is no difference between stores that the program has sales data for and those that it does not have data for. To adjust for these stores that are less likely to promote CFLs as aggressively as the stores that provide sales data, the final CFL sales estimates were calculated assuming that stores without sales data are only 25 percent as successful in selling CFLs as those with data, as the latter are more likely to have had assistance from the Lighting Program. The implications of this assumption are tested in the sensitivity analysis presented later in this section.

Shown in Table 7 is the calculation for one particular SIC code (5311-Department Stores) for urban Idaho in the fourth quarter of 2003. There are 13 stores in this category; 4 had sales data collected by ECOS and 9 did not. The average sales per employee for those stores with CFL sales for at least one quarter in this category is 0.9. The survey of stores selling CFLs (shown in Table 3) indicates that 41 percent of retailers in this category sell CFLs. This factor is used to adjust the CFL sales average to 0.4 CFLs per employee, as shown in column E. Next, we apply the 25 percent estimate for the difference of sales for stores with and without sales data, which results in a CFL sales per employee of 0.1 for these stores. Finally, we multiply this number by the number of employees in column B to get our estimated total, with the final total shown in column H.

Table 7: Sample Calculations for Quarterly CFL Sales for Stores Without Sales Data

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
	Sales of NonCoupons	Employees	Sales Per Employee	SIC CFL Seller Adjustment	Sales Per Employee with CFL Seller Percent Adjustment	Sales Data Adjustment	Sales Per Employee With Sales Data Adjustment	Estimated Sales
Store 1	317	350						317
Store 2	148	164						148
Store 3	148	164						148
Store 4	148	164						148
	762	842	0.9			Total of Stores With Sales Data		762
Store 5	NA	150	0.9	41%	0.4	25%	0.1	14
Store 6	NA	254	0.9	41%	0.4	25%	0.1	24
Store 7	NA	150	0.9	41%	0.4	25%	0.1	14
Store 8	NA	140	0.9	41%	0.4	25%	0.1	13
Store 9	NA	124	0.9	41%	0.4	25%	0.1	11
Store 10	NA	104	0.9	41%	0.4	25%	0.1	10
Store 11	NA	175	0.9	41%	0.4	25%	0.1	16
Store 12	NA	135	0.9	41%	0.4	25%	0.1	13
Store 13	NA	164	0.9	41%	0.4	25%	0.1	15
						Total of Stores Without Sales Data		129
						Total for Category		891

Using this estimation method, total CFL sales were calculated for each quarter covered in this analysis. These estimates are shown below in Table 8 and graphically in Figure 1.⁷

⁷ It should be noted that the estimated “other CFL sales”, which are not tracked by ECOS, are not included in the results presented in the Alliance’s annual Market Activities Report (MAR). This omission is reasonable given that the estimation

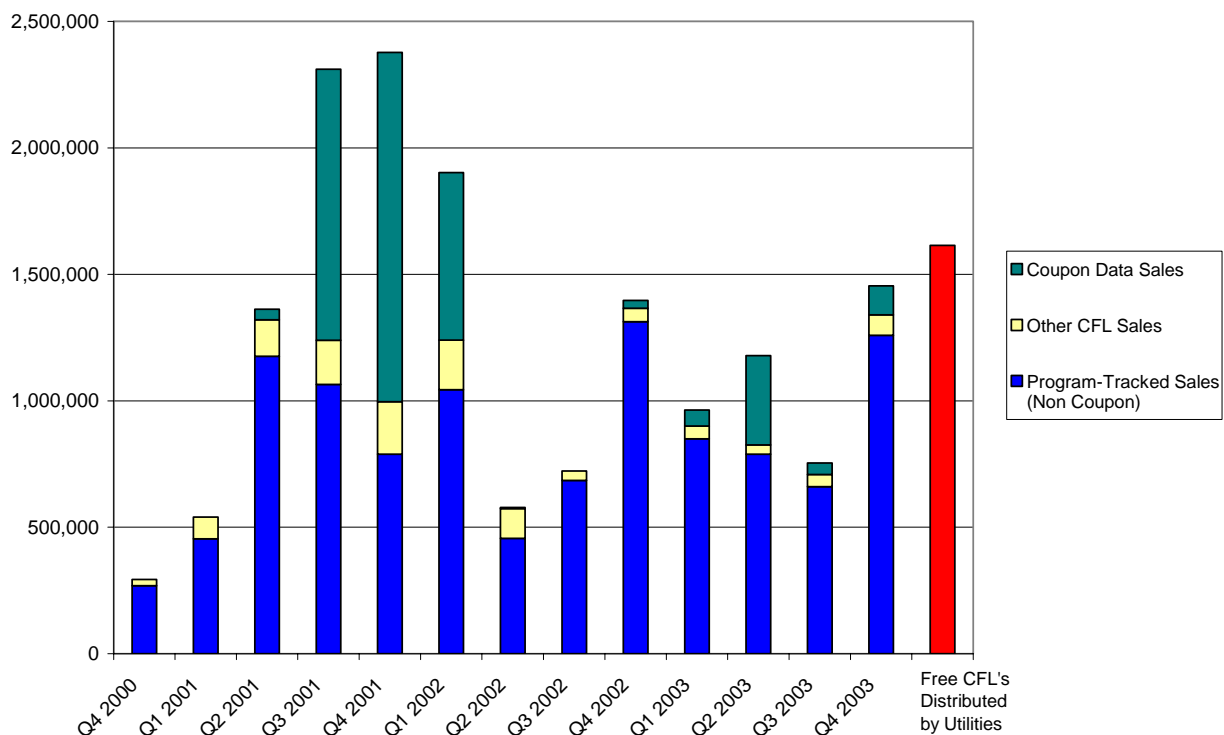
Since Quarter 4 of 2000, total CFL sales are estimated at 15,834,900 for the Lighting Program territory. In addition to promoting CFL sales, some utilities within the Alliance Territory also had campaigns where free CFLs were mailed directly to customers over the same time period (mostly at the height of the energy crisis.) Information on the total number of free CFLs bulbs distributed by the utilities was collected by ECOS. When these sales are combined with the 1,614,257 free CFLs distributed in the region by the utilities, the total number of CFLs reaching customers (both through the Lighting Program and through non-program channels) is estimated at 17,449,157 since the fourth quarter of 2000.

Table 8: Current Market Assessment of Regional CFL Sales and Free CFLs

Quarter	Coupon Data Sales	Program-Tracked Sales (Non Coupon)	Other CFL Sales	Total CFL Sales
Q4 2000	0	268,717	25,046	293,763
Q1 2001	0	454,678	85,259	539,937
Q2 2001	41,286	1,176,186	144,696	1,362,168
Q3 2001	1,071,357	1,065,263	174,225	2,310,845
Q4 2001	1,381,927	789,193	206,795	2,377,915
Q1 2002	662,421	1,044,325	195,505	1,902,251
Q2 2002	4,207	456,025	118,096	578,328
Q3 2002	348	684,790	37,267	722,405
Q4 2002	30,721	1,313,043	52,847	1,396,612
Q1 2003	63,111	850,167	50,046	963,324
Q2 2003	353,234	788,879	36,345	1,178,458
Q3 2003	45,689	660,493	48,392	754,575
Q4 2003	114,301	1,259,102	80,916	1,454,319
Total	3,768,602	10,810,862	1,255,436	15,834,900
Free CFL's distributed by utilities				1,614,257
Total CFL's				17,449,157

methodology described above has not yet undergone statistical validation. As a result, the numbers reported in the MAR likely understate regional CFL sales.

Figure 1: CFL Sales by Quarter and Free CFLs Distributed

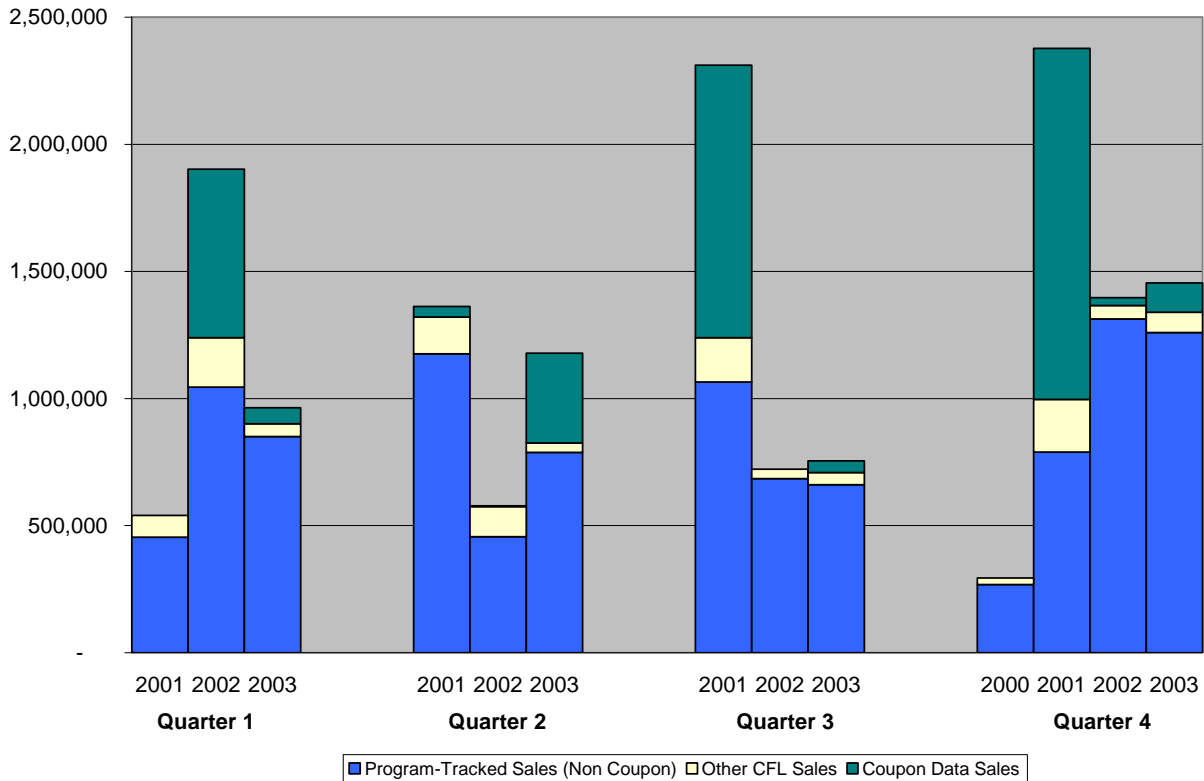


After a strong surge during the energy crisis in 2001 and early 2002, CFL sales dropped considerably once the Coupon Campaign ended. Program-tracked stores continued with solid CFL sales without coupons between Quarter 2 of 2002 and Quarter 3 of 2003.

The reemergence of coupons in the first half of 2003 provided an extra boost to total sales but did not have apparent crossover to the program-tracked sales the following quarter. However, in the fourth quarter, there was a strong push in non-coupon sales for these retailers. Much of this increase is due to large increases for two large retailers in the DIY and mass merchandiser channels. Because there are few of these types of stores that are not being tracked by the program, these gains did not have a corresponding effect on the sales estimated for those retailers comprising the “Other CFL Sales” category.

To examine the seasonal pattern of CFL sales, Figure 2 shows the same sales data organized by quarter. As can be seen, strongest sales are found in the fourth quarter, which corresponds to the traditional “lighting season” for all lighting sales. In general, quarterly comparisons between 2002 and 2003 show CFL sales remaining steady throughout the year after falling from the high levels observed during the energy crisis in 2001. The exception is Q1, but the high sales in 2002 are from coupon sales during the energy crisis, and non-coupon sales for this quarter show much less of a decrease between 2002 and 2003.

Figure 2: CFL Sales by Quarter/Year and Source



One of the measures of program success is the market share of CFLs as a share of all lighting sales in the program territory. Market share for CFLs prior to the Lighting Program was essentially zero and has increased substantially since the program's inception. For 2002, total lamp sales within the program territory were approximately 51,000,000.⁸ Total CFL sales for 2002 from the CFL sales database are 4,599,596, which results in a market share for CFLs of 9.0 percent. Assuming that total lamp sales remain the same for 2003 and given the CFL sales estimate of 4,350,676 for 2003 from the CFL sales database, market share for 2003 is about 8.5 percent.

Given the inherent uncertainty of extrapolating between stores it is important to look at how sensitive the results are to the underlying assumptions used in the estimation. To address this, we conducted a sensitivity analysis to determine how much the overall CFL sales estimates varied with changes in the assumption that non-program tracked sales are 25 percent of the sales of the program-tracked stores on a per employee basis. We tested this by running the model assuming a 50 percent change in sales intensity, which results in the original 25 percent sales factor ranging from 12 percent to 37 percent of participant sales rates. These results are shown in

⁸ Total lamp sales for the US in 2002 are estimated to be 1,240,238,085 as reported in the *California Lamp Report 2001 Volume 1* prepared by RER (now Itron) for Southern California Edison (October 2001). Sales for the Alliance territory were estimated using the fraction of the population in the program territory based on 2000 US Census data. For the purposes of estimating market share, we assume that lighting sales for the region will remain about the same for 2003.

Table 9 as an aggregate for the 13-quarter period covered in this analysis. For this entire period, the estimate of total CFL sales varied by 4 percent under different assumptions regarding non-program tracked non-coupon CFL sales.⁹ Given the magnitude of total CFL sales and the large portion of coupon sales, the sensitivity analysis shows that the overall assessment is not particularly dependent on the assumptions used to estimate sales outside the Lighting Program and Coupon Campaign.

Table 9: Sensitivity Analysis of the Non Program-Tracked Sales Percentage Assumption

Sales Percentage Assumption	Change From Base Case	Total CFL Sales 13 quarters	Percent Change
12.5 %	- 50 %	15,207,182	-4.0%
25 %	--	15,834,900	--
37.5 %	+ 50 %	16,462,617	+4.0%

3.3 SUMMARY

The market assessment shows that the CFL sales have remained consistently strong throughout the period covered by this evaluation. While there was an expected decrease once the Coupon Campaign ended, sales have remained strong and have not returned to the levels observed prior to the energy crisis. This trend provides an encouraging sign that CFL sales may be sustained in the long term. In addition, one large retailer that does not accept coupons saw CFL sales decline by 33 percent in 2002 from 2001, and then increase by 48 percent in 2003, which indicates that CFL sales can be sustained without the use of coupons. While we are not able to quantify the influence of the Lighting Program with certainty, there is no doubt that the retail relationships cultivated by the program were instrumental in bringing about these higher levels of CFL sales.

The next section presents results of the consumer survey, which includes information on consumer attitudes. In particular, survey questions regarding future lighting purchase intentions provide insights on the likely sustainability of current CFL sales trends.

⁹ Sensitivity analysis conducted for individual quarters did not show much fluctuation over time, with estimates only changing from 0 to 5 percent across individual quarters.

4. EVALUATION RESULTS – CONSUMER SURVEY

As a means to examine CFL sales sustainability and other evaluation issues, ECONorthwest organized a series of consumer surveys that gathered information on consumer lighting purchases and preferences. Specific topic areas included consumer awareness of CFLs, market barriers, product satisfaction, future purchase intentions, and lighting purchases following a customer’s previous experience with CFLs.

Fielded in May and June of 2001, the first customer survey (Wave I) occurred during the west coast energy crisis and the ensuing pro-conservation media campaign. The second survey (Wave II) was fielded in April 2002 after the energy crisis abated. The third instrument (Call Back) was also fielded in April 2002 and re-surveyed both CFL and incandescent purchasers from Wave I; the Call Back was designed to measure retention rates, satisfaction levels, and follow-through on previously stated CFL purchase intentions. The final set of surveys (Wave III) was administered in April and May of 2003 and followed the same design as the general consumer survey and the Call Back survey from Wave II.

4.1 SURVEY DESIGN

For each survey, we collected responses from households that had recently purchased CFLs or incandescent light bulbs; Table 10 describes each of the survey samples in detail. Designed to proportionally represent the overall Northwest population, the random samples were first stratified by state and then by residence in urban, suburban, and rural areas (based on population density.) Further, respondents were asked screening questions that divided them among three categories: CFL purchasers, incandescent purchasers, and free CFL recipients. These sub-groups ensured an equal range of experiences within each stratum and allowed for detailed analysis of survey results.

Table 10: Survey Design

Respondent Group	Wave I	Wave II	Wave III	Callback	Callback
				Wave I	Wave II
CFL Purchasers	246	202	156		
Incandescent Purchasers	316	166	176	180	75
Free CFL Recipients	38	32	21		
CFL Purchasers + Free CFL Recipients				163	125
Total Sample	600	400	353	343	200

Table 11 shows the sample distribution by geography for each of the survey waves. The sample was stratified by state and by county population density; “Urban” areas were considered those

counties with 200 or more people per square mile, “Rural” areas were classified as those with less than 20 residents per mile, and “Suburban” areas had between 20 and 200 people per mile.¹⁰ This sample design was used to ensure that consumers from all geographic regions within the program territory had appropriate representation in the survey sample.

Table 11: Sample Distribution by Geography

State	Geographic Area	Sample Design	Wave I	Wave II	Wave III
ID	Urban	3%	14	10	11
ID	Rural	3%	18	12	10
ID	Suburban	6%	33	22	24
MT	Rural	4%	23	16	14
MT	Suburban	4%	24	16	13
OR	Urban	15%	90	59	54
OR	Rural	2%	14	9	8
OR	Suburban	13%	76	50	45
WA	Urban	37%	221	148	125
WA	Rural	2%	15	9	9
WA	Suburban	12%	72	48	40
Total		100%	600	400	302

As an initial survey screen, consumers were asked about their awareness of CFLs, and those that are unaware are ultimately dropped from the remainder of the survey. Table 12 shows the responses to the initial awareness question across all three survey waves. In each survey, awareness of CFLs has remained consistently high across all geographic regions. (Given the relatively small survey sample within the sample strata, year-to-year differences—as well as geographic differences—are for the most part statistically insignificant.)

¹⁰ County population numbers are from the 2000 US Census. Some reclassification of counties was done in those instances where it appeared a different category was appropriate, such as when a county originally classified as “Rural” is located near an area of higher population density and the “Suburban” category is a more accurate description.

Table 12: CFL Awareness by Geography and Survey Wave

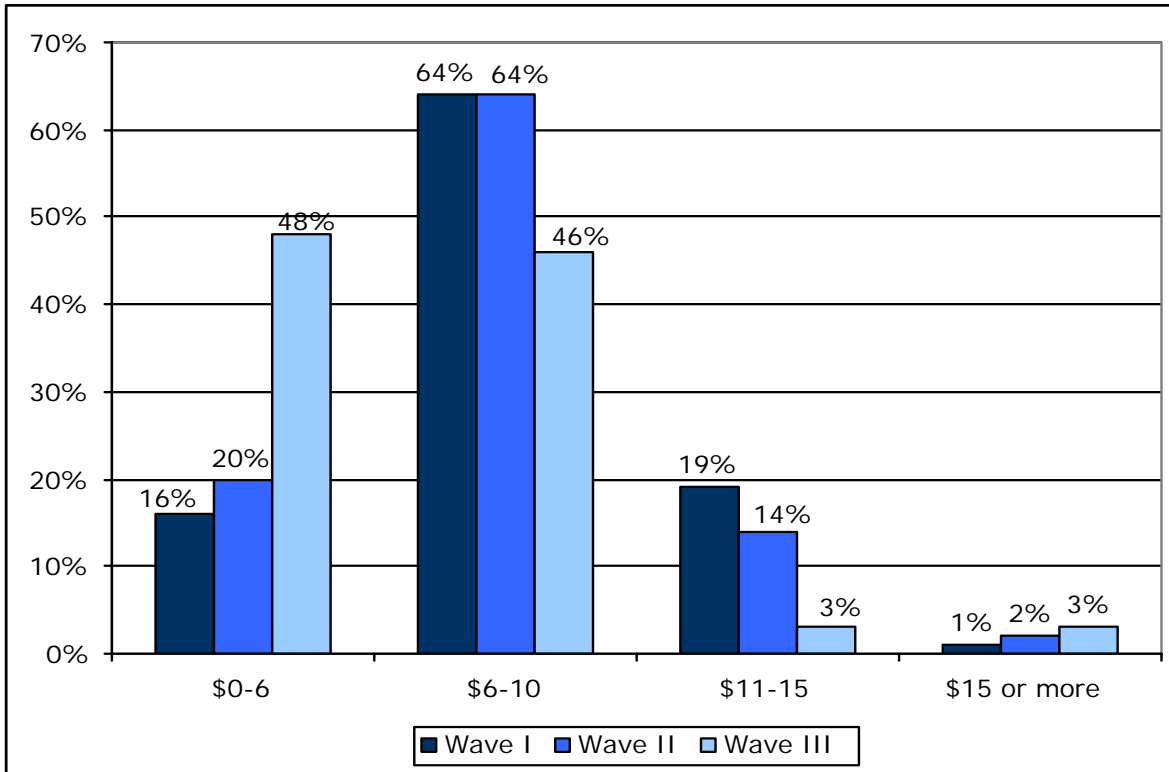
State	Geographic Area	Wave I	Wave II	Wave III
ID	Urban	70%	67%	92%
ID	Rural	68%	78%	90%
ID	Suburban	62%	68%	93%
MT	Rural	75%	76%	77%
MT	Suburban	72%	80%	81%
OR	Urban	88%	95%	91%
OR	Rural	89%	100%	83%
OR	Suburban	87%	89%	86%
WA	Urban	82%	92%	87%
WA	Rural	80%	85%	100%
WA	Suburban	87%	87%	92%
Total		82%	88%	88%
# Respondents		1421	756	709

4.2 GENERAL SURVEY RESULTS

Responses to selected survey questions are included in the next section. The survey instruments and frequencies for the Wave II and Wave III questions are included as an appendix to this report. All survey responses shown in this section are weighted to the population that is aware of CFLs within the program territory, using the geographic coding and survey responses shown in Table 11 and Table 12.

We use Figure 2 to describe changes in CFL product price over time. In survey waves I and II, a majority of consumers—64 percent in each case—paid \$6-10 for a CFL. This percentage dropped dramatically in survey wave III when only 46 percent of consumers paid \$6-10, and the percentage of consumers who paid only \$0-6 increased accordingly—from 20 percent in wave II to 48 percent in wave III. Generally, the data suggest that CFL prices continue to fall, but—as Figure 4 will demonstrate—prices remain sufficiently high to deter a number of potential buyers.

Figure 2: CFL Prices

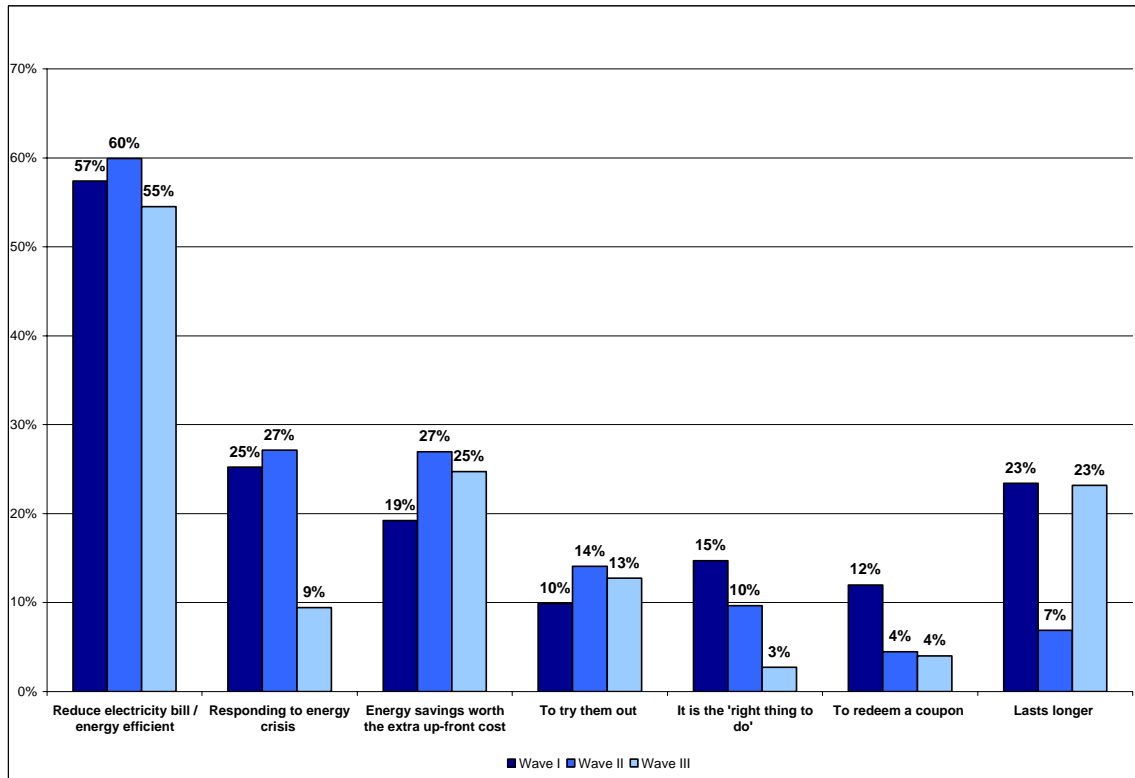


Q: Thinking about the most recently purchased compact fluorescent light bulb(s), what was the price of the bulb(s) before any discounts?

Sample Size: Wave I = 148, Wave II = 115, Wave III = 108

Figure 3 shows the reasons for purchasing CFLs among recent CFL purchasers across all three survey waves. Over half of the respondents said that saving energy and reducing their energy bill were a motivating factor for their CFL purchase. Consumers are also responding to the fact that CFLs last longer than incandescent bulbs and seem to accept that the increase in energy savings is worth the additional upfront cost for these bulbs. Not surprisingly, “Responding to the Energy Crisis” and “To Redeem a Coupon” both decreased as reasons, as concerns about the Energy Crisis and the use of coupons both decline significantly by the time of the Wave III survey.

Figure 3: Reasons for Purchasing CFL



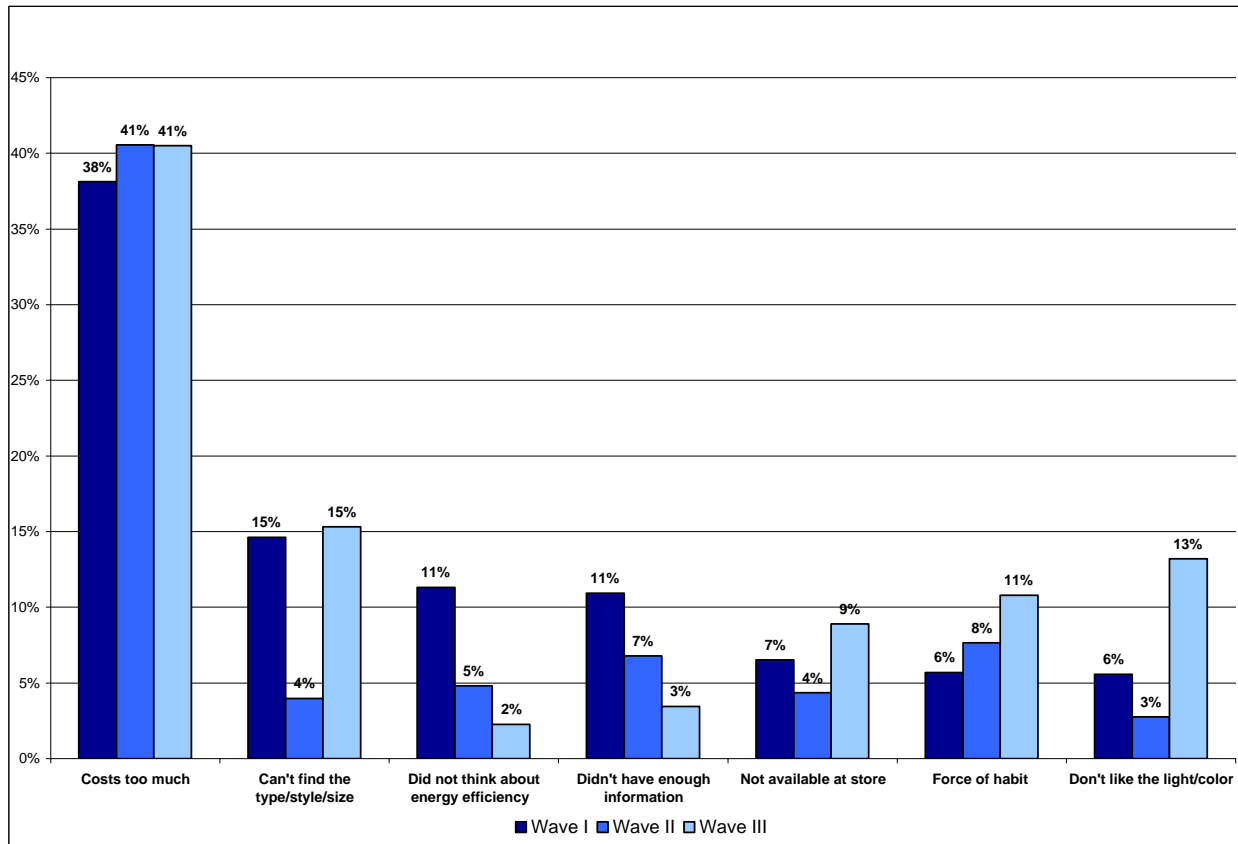
Q: Thinking about your most recent purchase, why did you purchase compact fluorescent light bulbs?

Sample Size: Wave I = 179, Wave II = 199, Wave III = 156

Figure 4 shows the reasons that recent purchasers of incandescent bulbs chose not to purchase a CFL. Clearly the cost of CFLs remains as the primary barrier, with 41 percent of the respondents citing this factor in Wave II and Wave III. Not being able to find the type or size of bulb required remains the second most stated barrier by incandescent purchasers, but was mentioned significantly less often than cost as a reason. Respondents stating that they did not think about energy efficiency at the time of purchase or that they did not have enough information to make a CFL purchase both declined dramatically by Wave III, with only 2-3 percent of the respondents mentioning these issues. This may be the result of program activities, which are designed to help reduce these barriers. The increase in respondents saying that they did not need them may be reflecting the fact that with the high levels of purchasing during the Energy Crisis, respondents already purchased CFLs for the high lighting areas and are relying on incandescent bulbs for areas with lower operating hours.

Some barriers that were targeted by the program have shown some increase across survey waves. The share of respondents citing “force of habit” as a purchase barrier has steadily increased across survey waves, and negative perceptions regarding CFL light color and quality have also increased significantly: 13 percent of incandescent purchasers recognized these barriers in the last survey, an increase from 3 percent in Wave II.

Figure 4: Reasons for Not Purchasing a CFL

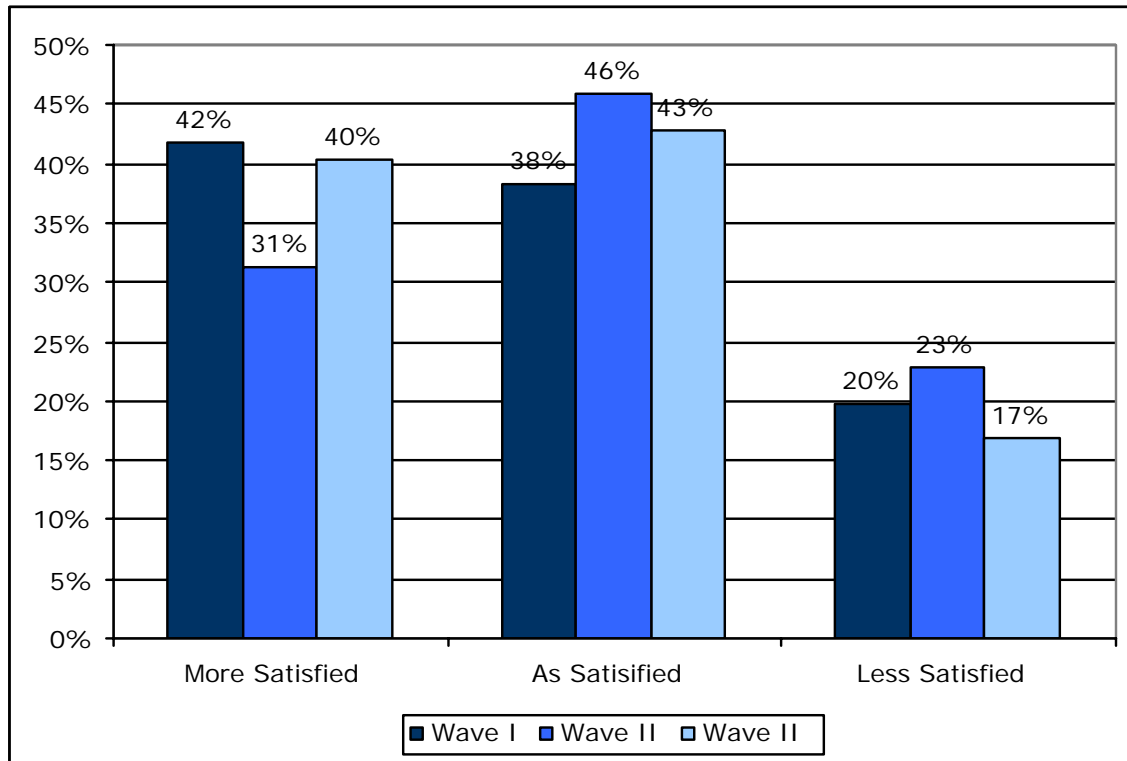


Q: When you recently purchased your new light bulbs, why didn't you purchase a compact fluorescent light bulb?

Sample Size: Wave I = 316, Wave II = 166, Wave III = 168

The next series of graphs relate to the CFL purchasers and their satisfaction with the CFL bulbs; Figure 5 provides a distribution of CFL purchasers by their reported satisfaction with CFLs relative to incandescents. Satisfaction levels have fluctuated slightly from one survey wave to the next, and in the latest survey over 83 percent reported that they were "More satisfied" or "As satisfied" with their CFL lamps relative to incandescents.

Figure 5: Satisfaction with CFLs Relative to Standard Bulbs Among Recent CFL Purchasers

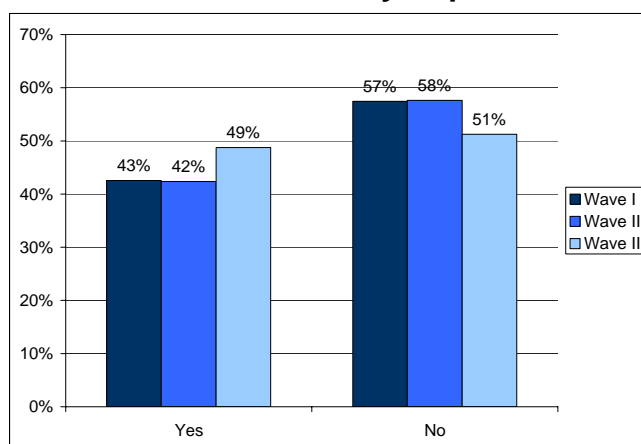


Q: Relative to standard bulbs, are you more, less, or as satisfied with your compact fluorescent bulb?

Sample Size: Wave I = 258, Wave II = 211, Wave III = 166

Figure 6 shows those CFL purchasers that were dissatisfied with any aspect of their CFLs. Responses to this question have remained consistently high, with almost half the CFL purchasers (49 percent in Wave III) stating that they had some reason for dissatisfaction. This has increased moderately from the 43 percent reported in Wave I and the 42 percent observed in Wave II. The subsequent graphs help shed some light on the reasons for dissatisfaction and how they will likely impact subsequent lighting purchases.

Figure 6: Dissatisfaction with Any Aspect of CFL Purchase



Q: Are you dissatisfied with any of the CFLs for any reason?

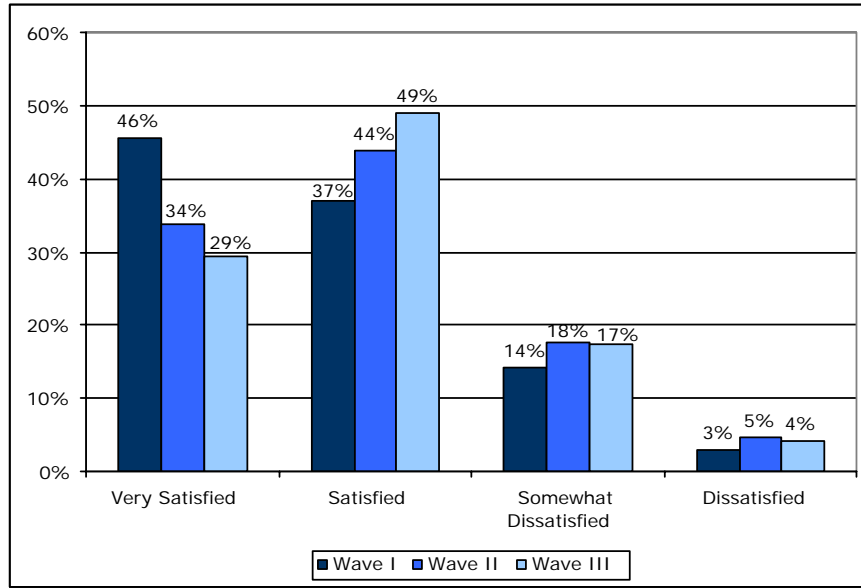
Sample Size: Wave I = 175, Wave II = 200, Wave III = 156

Figure 7 reveals satisfaction levels among those who had recently purchased CFLs. Respondents were asked to rate their satisfaction with CFLs on a 1 to 10 scale. Ratings of 9-10 were coded as ‘Very Satisfied’, 6-8 coded as “Satisfied”, 3-5 as “Somewhat Dissatisfied” and 1-2 as “Dissatisfied”.

As shown by these categorical responses, satisfaction with CFLs is relatively high in each survey period: in Wave I, more than 45 percent were “Very Satisfied” with CFLs, and approximately 35 percent were “Satisfied”. The number of those “Very Satisfied” decreased in Wave II and Wave III, and a large share of these consumers now appear only “Satisfied.” Generally, total ratings of “Satisfied” and “Very Satisfied” combined accounted for roughly 80 percent of responses, but there has been a distinct shift from the “Very Satisfied” to the “Satisfied” category in the later survey waves. In contrast, the number that was “Somewhat Dissatisfied” and “Dissatisfied” remained essentially constant across surveys.

The average satisfaction rating on the 1 to 10 scale was calculated for each survey wave and is shown at the bottom of Figure 7. In Wave I, CFL satisfaction had an average rating of 7.83, which is low enough to suggest that consumers are not consistently happy with the CFL products they have purchased. The average satisfaction ratings have fallen across surveys, with an average rating of 7.46 in Wave II and 7.27 in Wave III.

Figure 7: Satisfaction of Recent CFL Purchasers

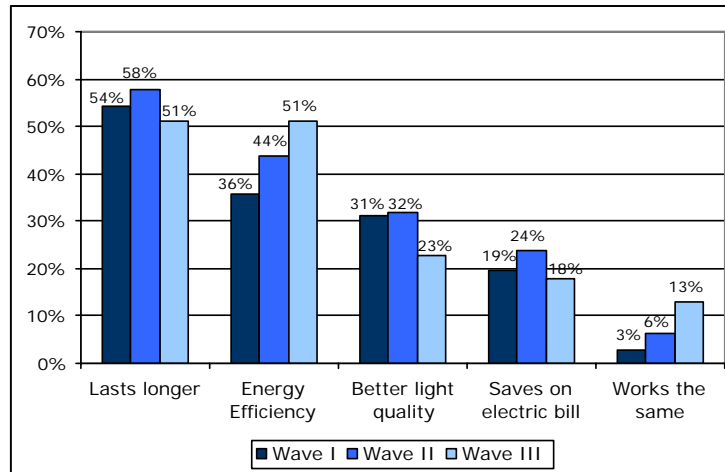


Q: Thinking about all of the compact fluorescent light bulbs you recently purchased, on a scale of 1 to 10, where a 1 is “Not at all satisfied” and a 10 is “Very Satisfied,” how satisfied were you with your compact fluorescent bulb?

Satisfaction	Wave I	Wave II	Wave III
Very Satisfied	46%	34%	29%
Satisfied	37%	44%	49%
Somewhat Dissatisfied	14%	18%	17%
Dissatisfied	3%	5%	4%
Mean	7.83	7.46	7.27
# of respondents	167	192	155

Figure 8 and Figure 9 provide additional information on satisfaction and dissatisfaction levels using questions that were asked specifically to compare their satisfaction with CFLs relative to incandescent bulbs. As shown in Figure 8, across all three surveys, many “more satisfied” respondents claimed the CFLs longer life made it an attractive alternative to conventional bulbs. This preference pattern remained relatively constant over time while, surprisingly, the CFLs efficiency appeal appeared to increase with each survey wave; one might have expected concerns for efficiency to *decrease* slightly as the urgency of California’s energy crisis faded. In a second important pattern, the number of consumers claiming CFLs functioned like other bulbs increased over time.

Figure 8: CFL Purchasers More Satisfied with CFLs than Standard Bulbs

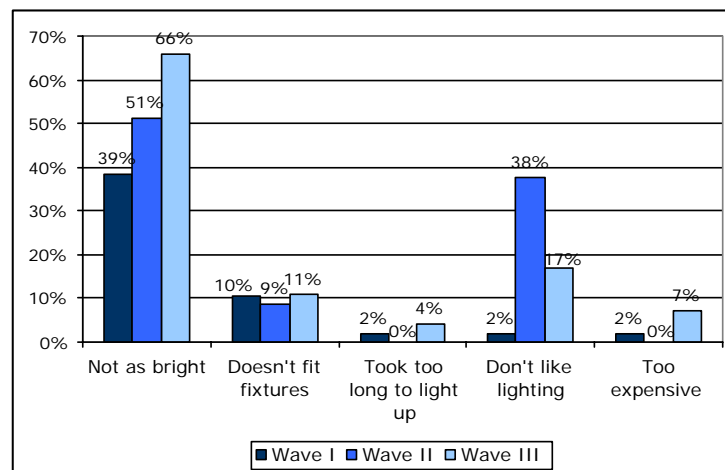


Q: Relative to standard bulbs, are you more, less, or as satisfied with your compact fluorescent bulb? Why do you say that?

Sample Size: Wave I = 108, Wave II = 66, Wave III = 67

Figure 9 reports reasons why those less satisfied with CFLs than with incandescent bulbs did not prefer the latter product. Across all three survey years, large numbers of “less satisfied” respondents claimed the CFLs relative dimness made them less desirable. This dissatisfaction with CFL light quality increased noticeably over time, perhaps reflecting a return to former preferences for brighter, less efficient bulbs as energy concerns appeared less pressing. While fewer consumers claimed CFLs were incompatible with fixtures, this concern was nonetheless consistently mentioned.

Figure 9: CFL Purchasers Less Satisfied with CFLs than Standard Bulbs

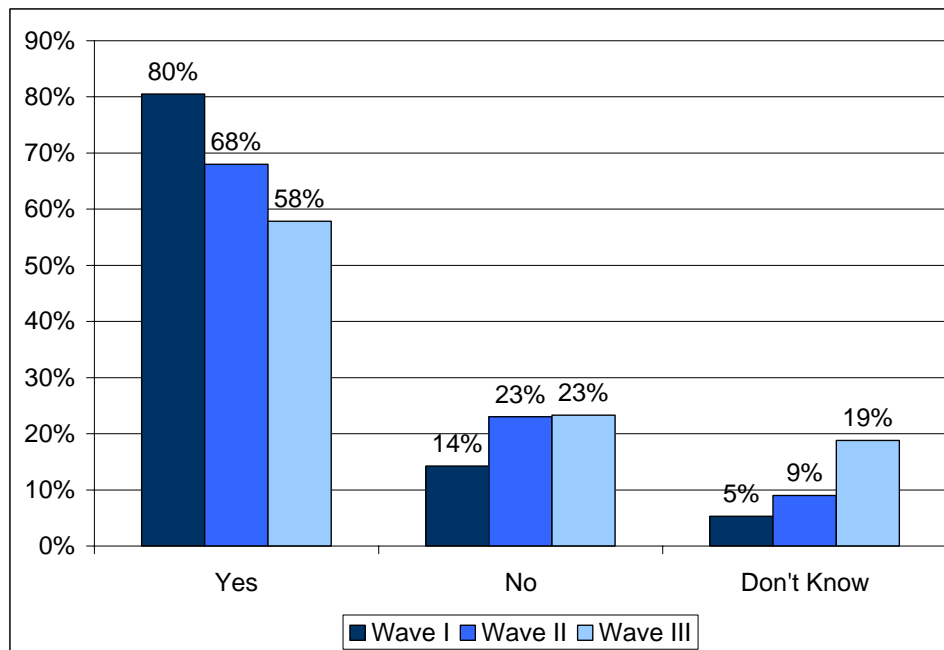


Q: Relative to standard bulbs, are you more, less, or as satisfied with your compact fluorescent bulb? Why do you say that?

Sample Size: Wave I = 51, Wave II = 48, Wave III = 28

The decrease in satisfaction also is reflected in stated intentions to purchase CFLs in the upcoming year. Figure 10 documents future purchase intentions among recent CFL purchasers across all three survey waves. In Wave I, future purchase intentions were very high with 80 percent of recent CFL purchasers expecting to purchase more CFLs in the upcoming year. This has fallen steadily in the next two survey waves and is likely due to decreased concern with conservation as the energy crisis subsided and dissatisfaction with CFLs for the reasons discussed earlier. By 2003 (Wave III), future purchase intentions had fallen to 58 percent, with an additional 19 percent of CFL purchasers uncertain if they will purchase CFLs in the upcoming year.

Figure 10: CFLs Purchasers That Intend to Purchase CFLs in the Upcoming Year



Q: Do you think that you will purchase a compact fluorescent bulb in the next year?

Sample Size: Wave I = 276, Wave II = 226, Wave III = 163

The preceding survey questions were targeted at current CFL experiences. Of central interest to this evaluation and the Lighting Program in general is how experiences with purchasing a CFL influence subsequent lighting purchases. The hope is that satisfaction with an initial CFL purchase will lead to sustained CFL purchasing behavior in the future – even in the absence of the Lighting Program. To assess progress and identify issues along these lines, the following section presents the results of our Call Back surveys.

4.3 CONSUMER CALL-BACK SURVEY: GENERAL RESULTS

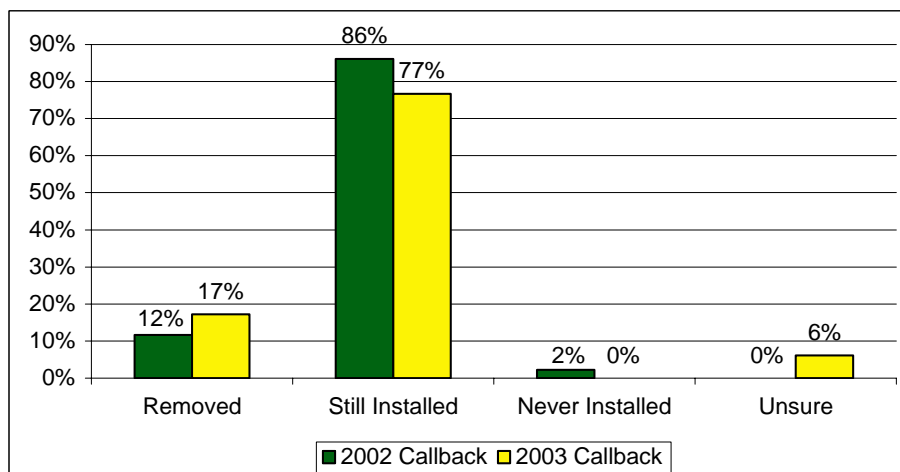
In addition to the general lighting survey, we also fielded two Call Back surveys to re-interview respondents from previous surveys. Administered in Spring 2002, the first call back survey targeted CFL and incandescent bulb purchasers from Wave I of the general consumer survey. The second instrument was administered in Spring 2003 and interviewed CFL and incandescent purchasers from the Wave II general consumer survey. The call back survey results were particularly useful as we sought to determine how a CFL purchase influences the

subsequent purchase of other lighting products. As shown in some of the following charts, some questions had particularly small sample sizes and these results should be interpreted with caution.

All responses are weighted to the population based on the population within each geographic category and the percentage of population within each geographic category that is aware of CFLs. Both Call Back survey instruments and response frequencies for all questions are included as an appendix to this report. Selected survey results are presented in the remainder of this section.

Figure 11 shows CFL retention rates within one year following the original survey.¹¹ Generally, most CFLs remain installed after their original purchase: In the 2002 Call Back survey (targeting purchasers from Wave I), 86 percent of the bulbs purchased were still installed after one year. Similarly, the 2003 Call Back survey (targeting purchasers from Wave II) had 77 percent of the original CFLs still installed after one year.

Figure 11: Retention of Original CFL



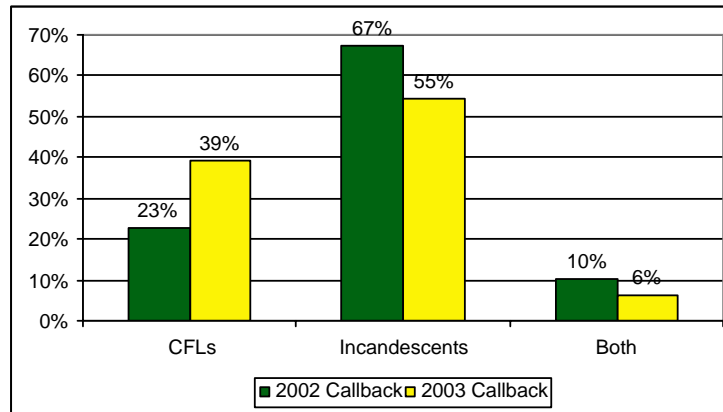
Q: Our records show that when we talked to you last time you had purchased compact fluorescent light bulbs. Are these bulbs still in use?

Sample Size: 2002 Callback = 492 (bulbs) 2003 Callback = 751 (bulbs)

Figure 12 shows the types of bulbs that most commonly replaced CFLs. A consistent majority of CFLs were replaced with incandescent bulbs, but survey responses also indicated that consumers were increasingly willing to replace CFLs with other CFLs. Given that a majority of consumers are nonetheless reverting to incandescents, an understanding of the reasons for this behavior will help inform the Lighting Program and provide guidance as to where program resources should be allocated.

¹¹ Given that the original CFL surveys asked about lighting purchases in the prior year, the Call Back surveys are asking about lighting purchases that occurred one to two years ago.

Figure 12: Type of Bulb Used to Replace CFLs



Q: If you removed the compact fluorescent light bulbs, were they replaced with incandescent bulbs or compact fluorescent light bulbs?

Sample Size: 2002 Callback = 32. 2003 Callback = 43

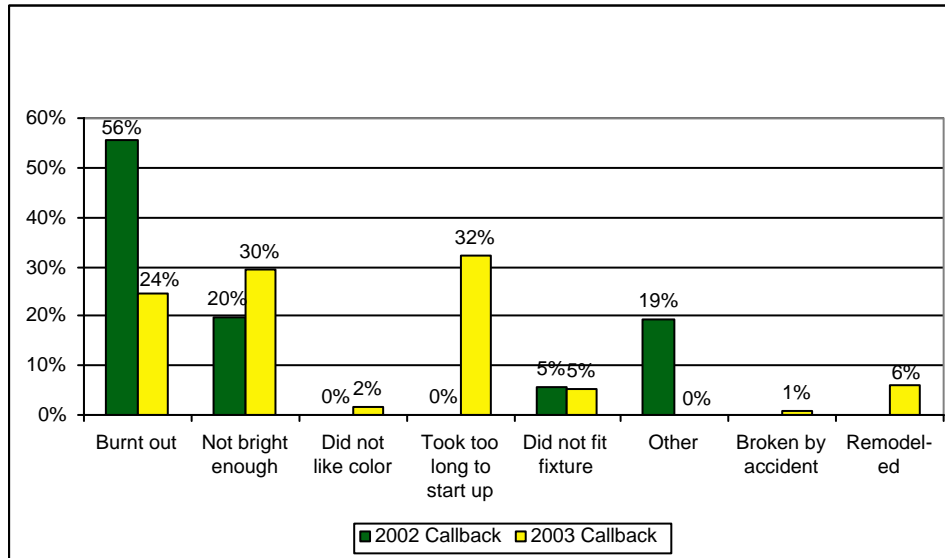
An analysis of the survey responses for the type of replacement bulb purchased and the reasons for removal also yielded some interesting results:

- For CFLs that were removed due to lamp burnout, there was a relatively even distribution across replacement lamp types. In the 2003 Call Back survey, for example, 28 percent replaced the burnt out CFL with another CFL, 13 percent replaced the CFL with an incandescent, and 39 percent replaced burnt out CFLs with both types of lamps. (19 percent did not replace the lamp).
- For CFLs that were removed because the lamp was not bright enough, most were replaced with incandescents. In the 2002 Call Back survey, 100 percent of these CFLs were replaced by incandescents and in 2003, 73 percent of the replaced lamps were incandescents.

This trends suggests that – at least in the short run – consumers are more forgiving of CFLs that burn out early and are willing to replace them with CFLs. For CFLs that do not provide adequate lighting – possibly due to inaccurate wattage conversion information, unexpected color rendering, or lumen depreciation after the bulbs have been in use over time – consumers are more likely to return to incandescents. These results are based on very small sample sizes (20 points or less), so the results should be interpreted viewed with caution.

Figure 13 shows responses for those respondents that replaced CFLs with incandescent bulbs for any reason. While respondents in both callback surveys cited a variety of reasons for replacing CFLs, bulb burnout, poor light quality, and long start-up times consistently dominating other concerns. From Wave I to Wave II, the number of respondents reporting burn-out decreased dramatically while the number replacing CFLs due to dissatisfaction with the light quality increased.

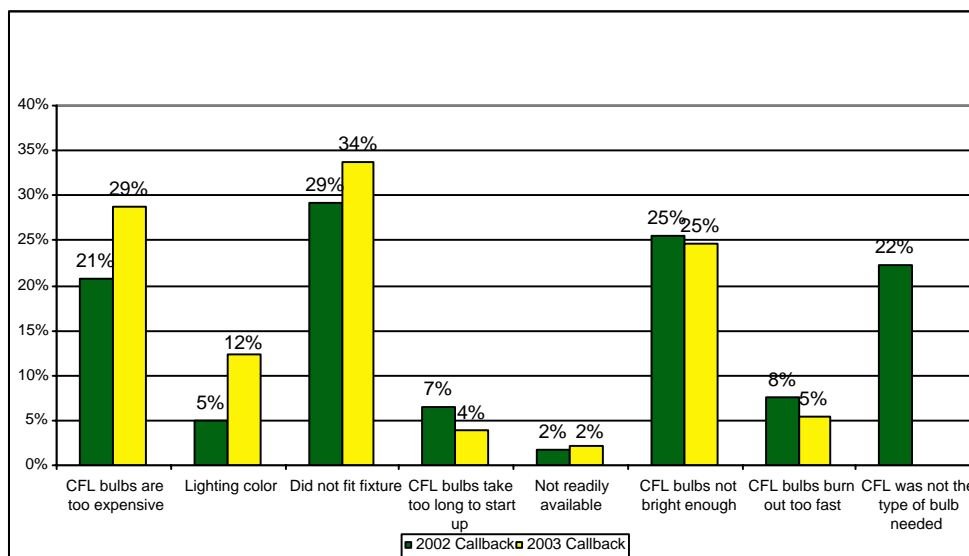
Figure 13: Reasons CFLs Replaced with Incandescents



Q: For each of the bulbs you removed, please tell me the reasons why you removed the bulbs.
Sample Size: 2002 Callback = 32. 2003 Callback = 56

Figure 14 shows reasons why former CFL purchasers chose to purchase incandescent bulbs at some point since the original survey. These results generally confirm the trend shown in the previous exhibit. For these customers, a CFLs cost, fixture compatibility, and light quality are among the most common reasons for purchasing an incandescent bulb instead. Frequency of these complaints either remained constant or increased over time, suggesting a limited consumer tolerance for products perceived to be too expensive or not aesthetically pleasing.

Figure 14: Former CFL Purchasers Who Buy Incandescents



Q: Why did you decide to purchase incandescent bulbs instead of compact fluorescent light bulbs?

Sample Size: 2002 Callback = 61. 2003 Callback = 64

4.4 SUMMARY OF CONSUMER SURVEY RESULTS

There are several important trends revealed by the consumer surveys:

- High levels of awareness for CFLs.** Consumers have shown high levels of awareness of CFLs throughout the different regions and geographic areas covered by the program. In general, CFL awareness has averaged about 80 percent and the high awareness levels have been sustained over time.
- CFL prices have decreased but remain a significant barrier.** Prices paid for CFLs have fallen, even without the use of coupons. In the first survey completed in 2001, 16 percent of CFL purchasers reported paying \$6 or less for a CFL (not including any coupons). By the time of the final survey wave in 2003, 48 percent of CFL purchasers reported paying \$6 or less. Despite this trend toward lower prices, high costs of CFLs remains a critical barrier and is cited consistently as the primary reason for not purchasing CFLs in all of the surveys fielded for this evaluation.
- CFL satisfaction decreasing.** Overall, satisfaction levels for CFLs have decreased from the high levels observed in 2001. Across all three survey waves, 42 to 49 percent of CFL purchasers indicated dissatisfaction with at least some aspect of CFLs. Average satisfaction ratings have also fallen over this period. Consistent with this decrease in satisfaction is a decrease in the stated intentions to purchase CFLs in the future. While 58 percent of recent CFL purchasers said that they still plan to purchase CFLs in the upcoming year, this has fallen from 80 percent observed in Wave I. This decrease in purchase intentions is likely due to a combination of decreasing concerns regarding the energy crisis and greater dissatisfaction with CFLs themselves.

- ***Lamp burnouts decreasing, but CFL replacements due to poor light quality increasing.***
The Call Back surveys show that fewer CFLs are being removed due to early burnout. For lamps that do burn out early, respondents appear somewhat forgiving and tend to replace them with other CFLs. For CFLs that are not bright enough or have other light quality issues, lamps are more often replaced with incandescents. In fact, dissatisfaction with lighting quality (either too dim or taking too long to start up) was the most often cited reason for CFLs being replaced with incandescents.

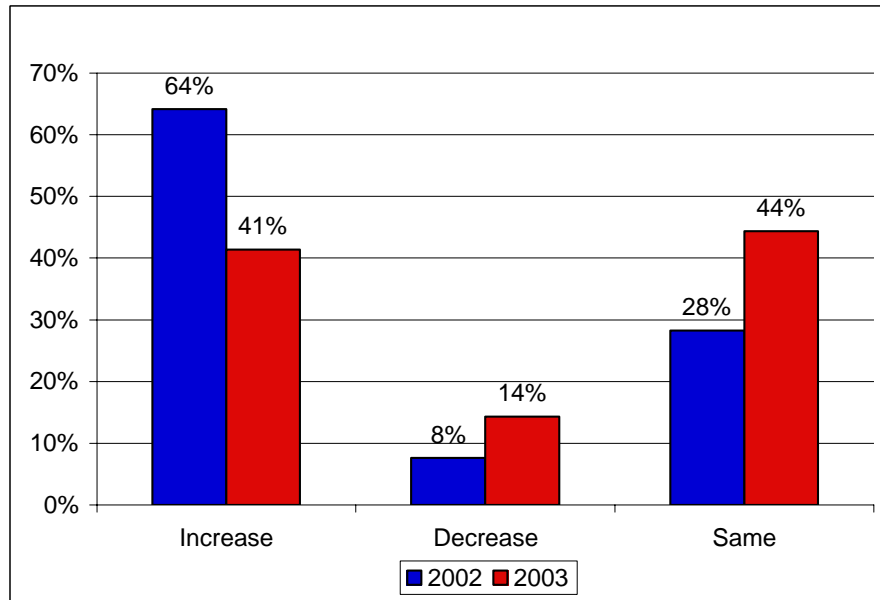
5. EVALUATION RESULTS – RETAILER SURVEY

In addition to the consumer survey, ECONorthwest also fielded a survey of retailers in 2002 and 2003 to provide an additional source of information on important CFL market trends. This survey was administered in person by ECOS Consulting field staff as part of their regular visits to retailers. Both surveys were administered in late spring (May and June) in 2002 and 2003; for 2002, 134 retailer surveys were completed and in 2003 135 surveys were completed. Key results from both surveys are presented in this section. A copy of the survey instrument and tabulations of all the results for both years are included as appendix to this report.

Due to limited evaluation resources (and in an attempt to reduce demands on field rep time) we did not attempt a random sample of retailers for this task, nor did we attempt to stratify the sample or survey results by channel or retailer type. Given that the same sampling method was used in both 2002 and 2003, the surveys are useful for comparing the general trends and outlooks of those retailers that are most often visited by field staff. The retailer surveys also provide a valuable source of supporting information for insights and conclusions drawn from the consumer surveys and other evaluation activities.

Figure 15 shows changes – over the prior year – in the number of brands and CFL models retailers carried. In 2002, 64 percent of retailers claimed they increased the number of brands and models they carried while 8 percent claimed they decreased the number; 28 percent reported their stock unchanged. In 2003, the number of retailers that expanded their CFL stock variety fell to 41 percent. This decrease, however, corresponded to an increase in retailers who reported no change in stock (44 percent of those surveyed.) Overall, 85 percent of retailers in 2003 indicated that the variety of CFLs they carried had either increased or remained unchanged from 2002, which suggests that the program may be having an affect on retailer stocking practices and that CFL stocking trends appear stable for at least the near term.

Figure 15: Change in Number of Models / Brands of CFLs Carried Over Prior Year

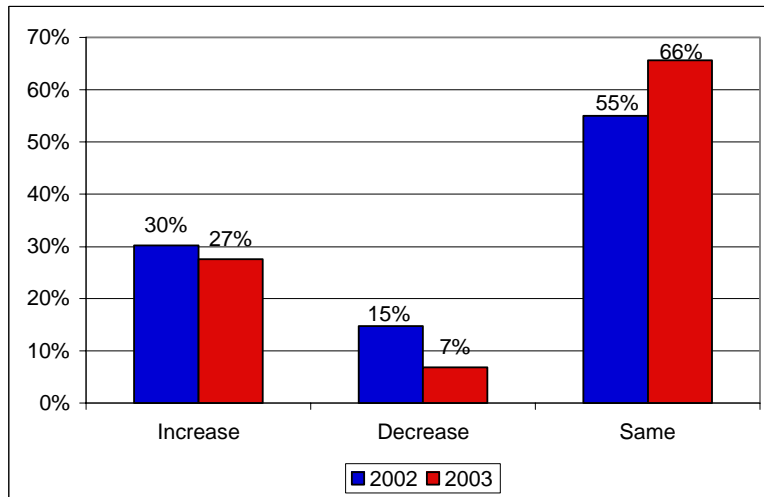


Sample Sizes: 2002 = 131, 2003= 133

Figure 16 reports anticipated changes in total CFL stock for the coming year. In 2002, nearly one-third of retailers intended to increase the number of CFL brands and/or models they would carry in the coming year, and more than one-half of retailers claimed their stock would remain unchanged; 15 percent intended to decrease the number of brands they would carry. In 2003, the number of retailers who intended to increase their stock fell slightly (now 27 percent), and the number of retailers who intended to decrease the number of brands and models fell by nearly half (now 7 percent.)

The combined result shows that 93 percent of retailers surveyed in 2003 planned to either increase or maintain their current variety of CFL brands and models. Again, this suggests that the lighting program is having a positive influence on retailer CFL stocking practices.

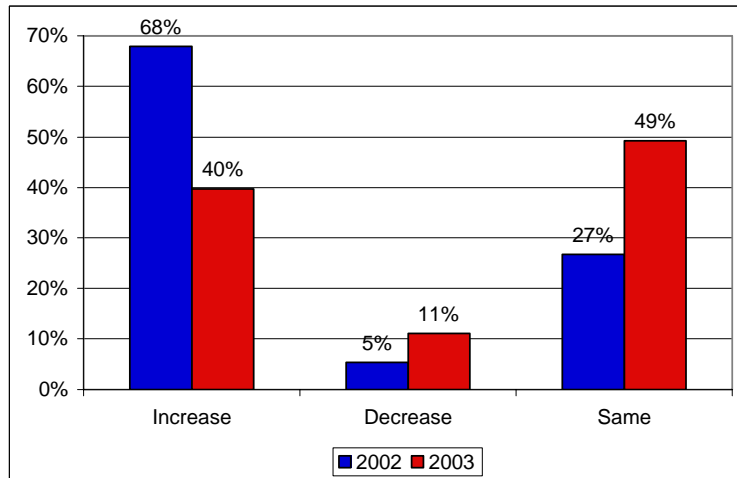
Figure 16: Expected Change in Number of Models / Brands of CFLs to be Carried in Coming Year



Sample Sizes: 2002 = 129, 2003 = 131

In 2002, 68 percent of retailers reported an increase the number of ENERGY STAR brands and models carried while 5 percent reported a decrease in that number; 27 percent claimed their stock had remained unchanged. In 2003, however, the number who claimed their stock had increased fell dramatically (now 40 percent) and both the number who claimed they decreased their stock and the number who maintained their stock approximately doubled. Nonetheless, 89 percent of retailers in 2003 claimed they had increased or maintained their stock of ENERGY STAR CFLs, which is consistent with trends revealed in general CFL stocking practices shown in the previous figures.

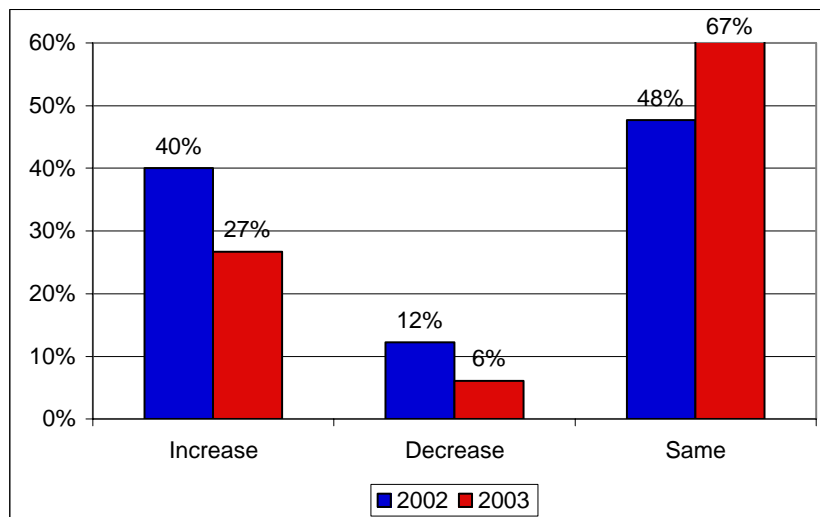
Figure 17: Change in Number of Models / Brands of Energy Star CFLs From Prior Year



Sample Size: 2002 = 131, 2003 = 136

Figure 18 reports anticipated changes in retailers' ENERGY STAR CFL stock for the coming year. In 2002, 40 percent of retailers intended to increase the number of ENERGY STAR models they carried while 48 percent of retailers intended to maintain their current variety; 12 percent planned on a decrease in the number of models. In 2003, both the number of retailers who intended to increase and decrease their stock variety fell (now 27 percent and 6 percent, respectively), and the number of retailers who planned on maintaining their stock composition increased to 67 percent. In all, 94 percent of retailers in 2003 intended to increase or maintain their variety of ENERGY STAR CFLs in the coming year, thereby sustaining the trends shown in Figure 17.

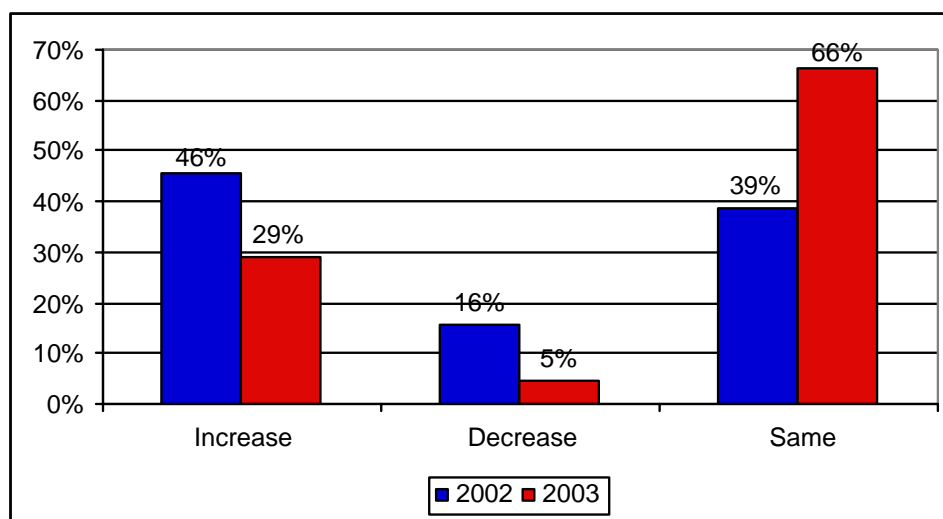
Figure 18: Expected Change in Number of Models / Brands of Energy Star CFLs to be Carried in the Upcoming Year



Sample Size: 2002 = 130, 2003 = 131

Figure 19 reports anticipated changes in retailers' ENERGY STAR CFL promotions for the upcoming year. In 2002, 46 percent of retailers anticipated an increase in CFL promotions while 39 percent planned on the same promotional level; 16 percent planned on decreasing their CFL promotions. In 2003, retailers clearly shifted towards maintenance of current promotional levels: only 29 percent and 5 percent of retailers planned on increasing or decreasing their CFL promotions, respectively, and 66 percent intended to maintain their current promotions.

Figure 19: Expected Change in Energy Star CFL Promotions for Coming Year

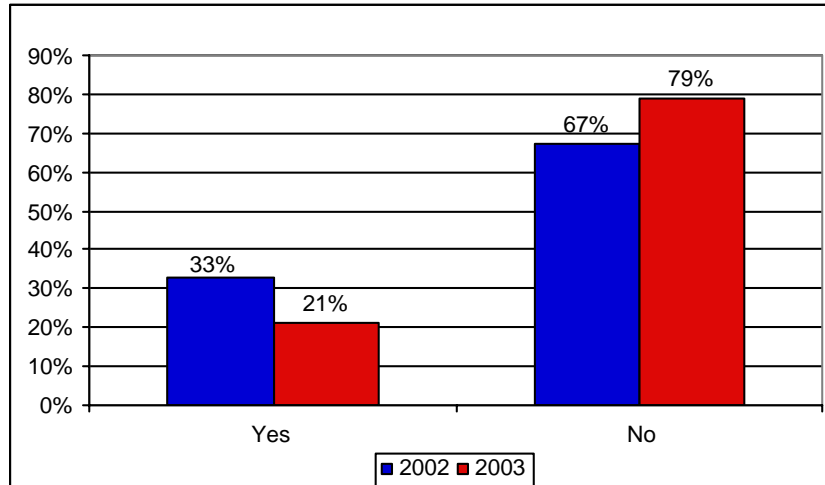


Sample Size: 2002 = 129, 2003 = 130

One of the largest CFL promotional events is the annual Change-A-Light promotion done nationally each fall. The Change-A-Light promotion is actively promoted by the Lighting Program and retailer plans for participating in this event are shown in Figure 20. Of the retailers we surveyed, most do not actively participate in this event, and the rate of participation has fallen from 33 percent in 2002 to 21 percent in 2003. The general trend in promotions shown in

Figure 19, however, suggests that overall promotions are remaining about the same. This suggests that retailers are finding other ways to promote CFLs without participating in Change-A-Light.

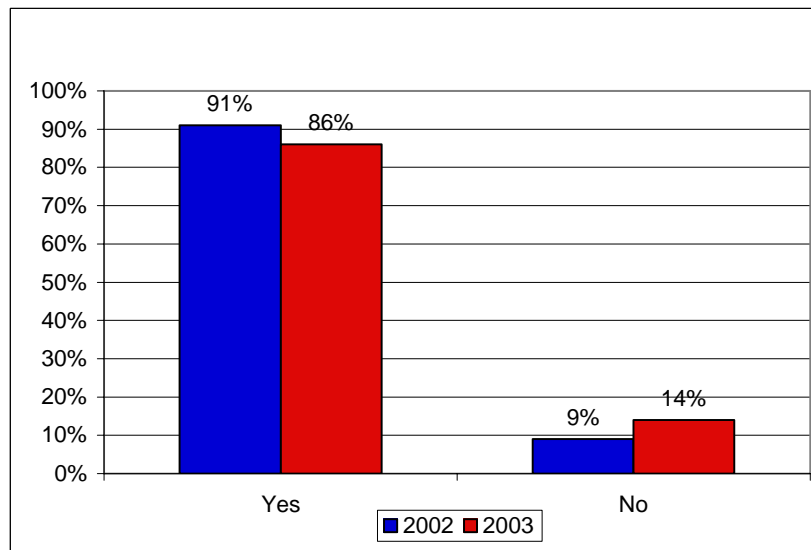
Figure 21: Plan to Participate In Change-A-Light Promotion



Sample Size: 2002 = 109, 2003 = 123

Figure 22 reports retailers' perceptions of consumer awareness attributable to the Lighting Program. In both 2002 and 2003, the vast majority of retailers (91 percent and 86 percent, respectively) felt the Lighting Program had increased consumer awareness of ENERGY STAR CFLs; much smaller shares of retailers (9 percent and 14 percent, respectively) felt the Program did not increase consumer awareness.

Figure 22: Perceived Increase in Customer Awareness of Energy Star CFLs Attributable to Lighting Program

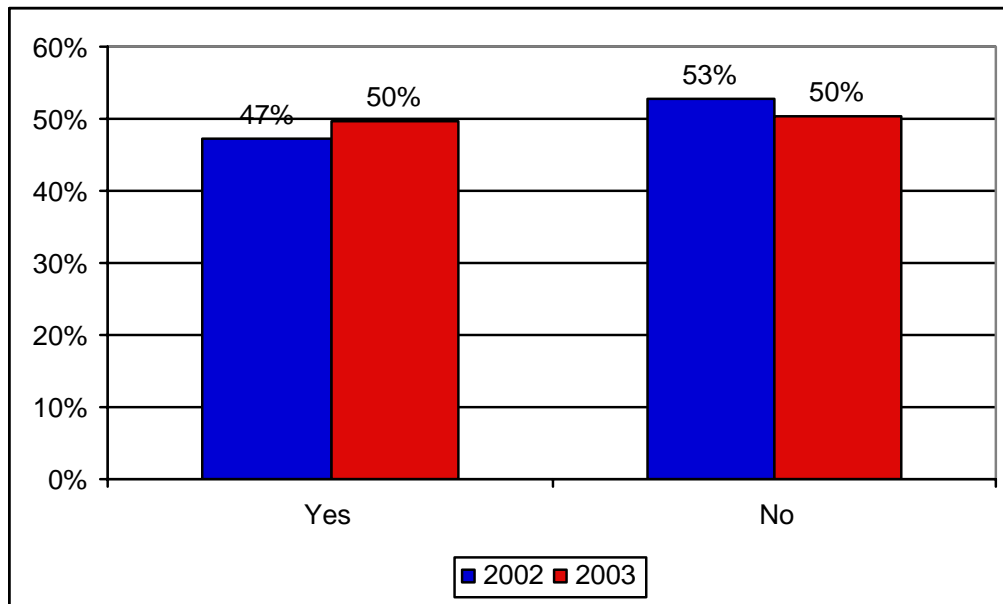


Sample Size: 2002 = 133, 2003 = 129

Figure 23 reports consumer preferences for the ENERGY STAR brand of CFL products. In 2002, slightly less than half (47 percent) of customers specifically requested the ENERGY

STAR brand while slightly more than half (53 percent) communicated no brand preference. These preference patterns were essentially unchanged in 2003: 50 percent of customers specifically requested the ENERGY STAR brand and 50 percent expressed no brand preference. Generally, consumer interest in ENERGY STAR products appears relatively stable across both survey periods.

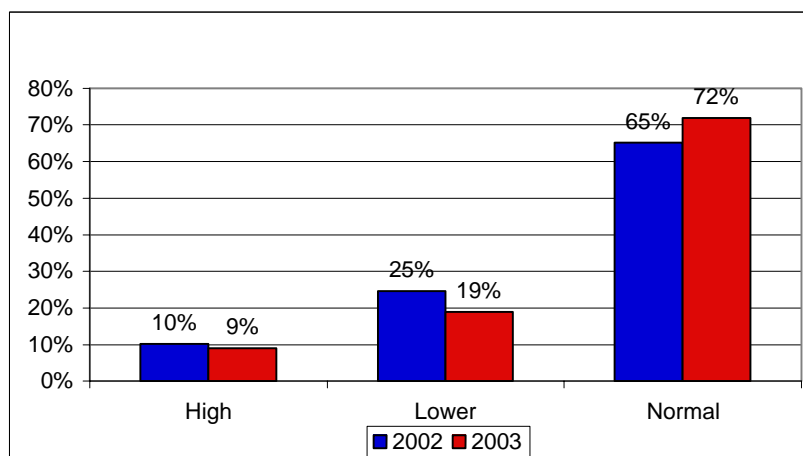
Figure 23: Customers Asking Specifically for Energy Star Products



Sample Size: 2002 = 129, 2003 = 125

Figure 24 reports retailers' perceptions of CFL complaints as compared to other product complaints. In 2002, the majority of retailers (65 percent) claimed the level of CFL-related complaints equaled the complaint level associated with other products; 25 percent of retailers claimed to receive fewer CFL-related complaints, and 10 percent claimed to receive more complaints. In 2003, the share of retailers observing a normal level of CFL-related complaints increased to 72 percent while the share of those observing fewer and more complaints fell to 19 percent and 9 percent, respectively. From the retailer surveys, it appears that CFLs tend to elicit the same complaint level as other products. This does not measure the satisfaction levels of those that had problems with CFLs and did not complain to the retailer, however, and therefore may be an understatement of true complaint levels. Relative to other more expensive products (such as appliances), CFLs would be considered a low-ticket item and consequently purchasers may not bother to complain directly to the retailer. (This issue is addressed in much greater detail in the discussion of the consumer surveys.)

Figure 24: CFL Complaint Level Relative to Other Products



Sample Size: 2002 = 126, 2003 = 132

5.1 SUMMARY OF RETAILER SURVEYS

Key findings from the 2002 and 2003 retailer surveys are as follows:

- ***CFL stocking stable.*** Retailers are generally reporting that their stocking of ENERGY STAR CFLs will either increase or remain stable in the near term. Similarly, retailers plan to maintain current levels in the number of brands and models of CFLs they carry in the upcoming year.
- ***Promotion level stable.*** As with product stocking, retailers expect CFL promotional activities to remain about the same in the upcoming year. Although overall CFL promotions are expected to remain stable, retailers indicated that they are less likely to participate in the “Change A Light” promotion in the future.
- ***Consumer awareness high.*** The retailer survey confirmed the high CFL awareness levels found in the consumer survey. Retailers reported that customers are generally aware of ENERGY STAR CFLs and half of the retailers we surveyed said that customers are asking for ENERGY STAR products.
- ***Low levels of CFL complaints.*** Retailers report generally normal levels of complaints from customers regarding CFLs. Given the relatively low price for these products (relative to large appliances, for example), it is possible that customers that are dissatisfied are not taking the trouble to report back to retailers about problem lamps.

6. REVIEW OF COST EFFECTIVENESS ASSUMPTIONS

As part of this evaluation, we reviewed the assumptions and parameter values used by the Alliance to determine cost effectiveness for the Residential Lighting Program. For each of these pivotal assumptions, we reviewed the current values and provide a recommendation for setting these parameters moving forward. Recommendations for future data collection and tracking efforts that will help inform the cost effectiveness modeling and refining the key parameter values are included at the end of this section.

6.1 PREVIOUS RECOMMENDATIONS

The previous MPER recommended that the cost effectiveness model assumptions be adjusted to reflect higher levels of total CFL sales within the program territory (above the assumed amounts of 355,000 in 2000 and 455,000 in 2001). The previous MPER also recommended that the CFL cost assumptions be adjusted downward to reflect the general trend of lower CFL prices.

Both of these recommended adjustments were made for the current cost effectiveness model for the Residential Lighting program. Additional recommended adjustments based on the current model parameters are discussed below.

6.2 REVIEW OF CURRENT PIVOTAL ASSUMPTIONS

As part of the evaluation for the Residential Lighting Program, the assumptions underlying the cost effectiveness calculations for the program were reviewed.

Incremental First Cost

Assumed Value

\$8.00 per lamp for 2001-2002, with the \$8.00 coming from market data provided by ECOS Consulting. First cost is assumed to decrease to \$5.00 per lamp for 2003, and \$3.00 per lamp from 2004 onward.

Assessment

The current value of \$5.00 is consistent with the latest survey responses that reflect CFLs purchased in 2003, where 48 percent of respondents reported paying \$6 or less for CFLs. However, it is unlikely that the average incremental cost of CFLs has fallen to \$3.00 in 2004.

Recommendation

Maintain the assumed first cost of \$5.00 until that time when market data can be collected that supports the \$3.00 incremental first cost assumption.

Displaced Wattage

Assumed Value

Displaced wattage is the difference between the average wattage of bulbs replaced and the average wattage of the replacement CFL. This value was originally set at 74 watts per lamp and revised by the Alliance to 52 watts per lamp in March 2004.

Assessment

In 2003, a Retrospective Assessment¹² of the Alliance market transformation accomplishments was completed. The ENERGY STAR lighting program was one of four programs reviewed in depth, and this review addressed many of the program's cost-effectiveness model assumptions. The Retrospective Assessment report adjusted displaced wattage from 74 watts per lamp installed to 58 watts per lamp. The report cites 3 studies that found displaced wattage to be more in line with the lower estimate.¹³ The report acknowledges that while the higher estimate was developed by the Northwest Power Planning Council (NWPPC), it was developed early on in the program when there was a preponderance of higher wattage bulbs and a focus on high-use areas. Since the majority of lamps were sold in 2001-2002, the report argues, it makes sense to use a more current estimate of displaced wattage.

Since the Retrospective report was published, Alliance staff performed an additional analysis of displaced wattage that looks at assumed substitution wattages of CFL lamps for incandescent lamps, and applies the distribution of CFL sales by wattage reported for California in its 2002 Statewide program evaluation.¹⁴ The analysis yields an estimated average displaced wattage between 49 and 53. The NWPPC is currently recommending a value of 52 for average displaced wattage in its draft 5th Northwest Power Plan.

Recommendation

Keep using 52 watts for the CFL displaced wattage value.

Operating Hours

Assumed Value

2.4 hours per day (interior), 3.4 hours per day (exterior).

Assessment

The Retrospective Assessment recommends adjusting operating hours from an average of 3 hours per day for interior locations to an average 2.75 hours per day, and from 5 hours per day for exterior locations to an average of 4 hours per day. The report cites two studies that support a lower average value for operating hours per day.¹⁵ One of these studies is based on logger data collected for the 1996 Tacoma Public Utilities (TPU) study, which is also used as the basis for the RTF's 2004 plan assumptions.

¹² *Findings and Report Retrospective Assessment of the Northwest Energy Efficiency Alliance Final Report*. Prepared by Summit Blue Consulting and Stratus Consulting for the Northwest Energy Efficiency Alliance, (December 2003).

¹³ *US Lighting Market Characterization – Volume I: National Lighting Inventory and Energy Consumption Estimate*. Prepared by Navigant Consulting for the US DOE, September 2002; *Conservation Kit Program Evaluation*. Seattle City Light, 2003; *Impact Evaluation of MPCs Residential Lighting Program*. Hagler Bailly, December 1995.

¹⁴ *Evaluation of the 2002 Statewide Crosscutting Residential Lighting program*. Prepared for San Diego Gas and Electric, Pacific Gas and Electric, and Southern California Edison by Kema-Xenergy, October 2003.

¹⁵ Navigant Consulting, 2002; Hagler Bailly, 1995.

Since the time the Retrospective Assessment was published, an additional analysis based on data from the 2001 and 2002 consumer CFL surveys on distribution of CFLs installed by room type was conducted as part of this evaluation. This distribution was then applied to the operating hours data logged in the TPU study for the same room types. The analysis yielded average indoor hours of use of 2.4 and 2.5 for 2001 and 2002, respectively, and outdoor hours of use of 3.4 for both years. These values are consistent with the values used by the Northwest Public Power Council, which is using 2.3 and 2.8 for indoor and outdoor, respectively, in its draft 5th Northwest Power Plan.

Recommendation

Use 2.4 for indoor hours and 3.4 hours for outdoor values and update as new information becomes available from the NWPPC or upcoming Alliance program evaluations.

Installation / Retention Rate

Assumed Value

80 percent of the purchased CFLs are assumed installed.

Assessment

The Retrospective Assessment defines installation/removal rate as the proportion of CFLs that were installed and not replaced with another CFL. It adjusts the value in the Alliance cost-effectiveness model from 88 percent down to 72 percent; although it seems that the logic supporting this recommendation is flawed. In the two Call Back surveys done as part of this evaluation, respondents reported that 86 percent of the bulbs purchased in 2001 and 77 percent of bulbs purchased in 2002 were still installed after one year. These figures from the Call Back surveys are also very similar to installation rates reported in two other lighting studies.¹⁶ The combined rate from both survey years is a two-year average installation rate of about 81 percent (average weighted by CFLs purchased bulbs by respondents in each survey).

In contrast, the Retrospective Assessment also cites a 10-year old study that used a 79 percent installation rate.¹⁷ The Retrospective states that this value should be discounted because not all CFLs purchased are installed and it appears that on this point the rationale is confused. The Call Back survey question asks consumers how many of the bulbs they purchased are installed, so the resulting proportions already account for bulbs not installed.

The 81 percent rate derived from the Call Back surveys is likely a lower bound as not all of the CFLs purchased had been installed at the time of the survey. If there is no upward adjustment, then all CFLs not installed at the time of the survey are essentially assumed to be discarded. While the actual percent that ultimately will be installed is open to debate, it seems unreasonable to assume that *none* of the additional bulbs will be installed at some future date.

¹⁶ Seattle City Light, 2003; KEMA-Xenergy, 2003.

¹⁷ Hagler Bailly, 1995.

Recommendation

Use a CFL installation / retention rate of 81 percent until additional information can be collected on long-term installation rates.

Baseline CFL Sales

Assumed Value

Baseline CFL sales are assumed to be 250,000 annually for 2001-2003.

Assessment

We reviewed the Alliance calculations used to support the assumption of 250,000 CFL baseline sales. The estimates resulting from this exercise for 1997 through 2002 are shown at the bottom of Table 13.¹⁸

The basic steps taken by the Alliance to estimate baseline CFL sales are as follows:

- 1) Estimate total national medium base bulb sales including incandescent and CFLs (Lines 1-3 in Table 13)
- 2) Subtract out both incandescent and CFL sales for "active" regions that have large CFL programs (Line 4). Active regions include California, Vermont, Wisconsin, and states covered by the Northeast Energy Efficiency Partnership (NEEP) programs.
- 3) Estimate a market share for CFL sales as a percent of medium base sockets for "non-active" regions (Line 7)
- 4) Multiply total Pacific Northwest Medium base (Line 8) sales by "non-active" region market share of CFLs (Line 7) to estimate baseline Pacific Northwest CFL sales for the program territory (Line 9).

¹⁸ National CFL and lighting sales are taken from the *California Lamp Report 2001 Volume 1* prepared by RER (now Itron) for Southern California Edison (October 2001). CFL sales for Wisconsin were taken from *CFL Sales in Wisconsin: Sales Tracking Results and Program Attribution*, a presentation made by Shel Feldman to the National Energy Star Partners (March 2003). Vermont CFL sales are from *Final Report: Phase I Evaluation of the Efficiency Vermont Efficient Products Program*. Prepared by Kema-Xenergy for the Vermont Department of Public Service (June 2002). CFL sales for the NEEP programs in the Northeast US were provided by Subid Wagley at NEEP. The share of national bulb sales attributed to the Pacific Northwest was determined by population using 2000 population numbers from the US Census.

Table 13: Estimated CFL Baseline Sales

Line		1996	1997	1998	1999	2000	2001	2002
(1)	National Sales of bulbs	1,410,940,801	1,421,291,151	1,431,717,429	1,442,220,191	1,452,800,000	1,484,200,000	1,240,238,095
(2)	CFL Share of Sales	0.13%	0.20%	0.31%	0.49%	0.50%	1.50%	2.10%
(3)	National CFLs	1,810,311	2,853,555	4,498,000	7,090,104	7,264,000	22,263,000	26,045,000
(4)	Active Region CFLs	0	0	1,001,223	1,358,498	2,152,253	17,521,695	11,147,198
(5)	Non Active CFLs	1,810,311	2,853,555	3,496,777	5,731,606	5,111,747	4,741,305	14,897,802
(6)	All Non-active Sales	1,410,940,801	1,421,291,151	964,191,765	1,206,521,421	1,187,682,997	1,145,522,210	957,229,675
(7)	Percent CFLs	0.13%	0.20%	0.36%	0.48%	0.43%	0.41%	1.56%
(8)	PNW All	57,715,060	58,138,444	58,564,935	58,994,555	59,427,326	60,711,754	50,732,402
(9)	PNW CFLs	74,051	116,726	212,394	280,255	255,773	251,285	789,571

The estimates reported here are the result of a relatively crude estimation method but utilizes the best data available. Because of the size of the national lighting market, small changes in market share (ranging from 0.13 to 1.56 as shown in Line 7) will have very large impacts on the baseline estimate. There are also two important caveats for these calculations. First, national lighting and CFL sales data were missing for early years (1997 and the first half of 1998) and consequently values for these years were interpolated using growth rates calculated from years where data are available. Second, not all of the regions that had active CFL programs were subtracted out to determine the “non-active” CFL sales. In particular, the New York State Research and Development Authority (NYSERDA) had an active CFL program during this period, but CFL sales for New York were not available and consequently were not included among the “active” regions. The resulting effect for the calculations shown in Table 13 is that baseline CFL sales are *overestimated*, as New York (and their relatively high level of CFL sales compared to “non-active” regions) has been included in the “non-active” CFL sales estimate.

A more fundamental problem is how to account for the influence that the Alliance’s Lighting Program has had on *national* CFL sales. As discussed in the first MPER, the success of BPA’s Coupon Campaign is due in part to the earlier work by the program to persuade retailers to begin carrying CFLs prior to the energy crisis. As the Pacific Northwest began experience huge volumes of CFL sales, national chains such as Home Depot and Lowe’s began to push CFLs in other regions of the country. The Alliance program should get some credit for this spillover, but to date no attempt has been made to quantify this effect. Given that California also saw large amounts of CFL sales at the same time, it may be impossible to accurately disentangle these effects to isolate the influence the Alliance has had on national CFL sales.

From a cost effectiveness stand point, the national spillover issue makes determining baseline CFL sales more difficult following the energy crisis. As shown Table 13, estimated baseline sales for 2003 are estimated by the Alliance to be 789,571 in 2002, but as argued above at least part of this increase should be counted as spillover and credited to the Alliance.

Recommendation

Keep the current CFL sales baseline assumption of 250,000 for 2001-2003, as this is the best estimate currently available and is likely somewhat conservative due to the issues with NYSERDA data and national spillover effects discussed above.

Refining the baseline estimate would require collecting additional data from the NYSERDA region, as well as investing additional resources to estimate the effects that the Alliance program has had on national CFL sales. One possible method is to conduct in-depth interviews with top executives at some of the larger retail chains such as Home Depot, Costco, and Lowe's to determine how much the market in the Pacific Northwest influenced their stocking practices and marketing efforts in other regions of the country.

6.3 LONG-TERM TRACKING RECOMMENDATIONS

As discussed above, the following parameters should be tracked in future program evaluations to help refine the cost effectiveness modeling assumptions:

- Installation and retention rates for all CFLs purchased
- Operating hours and location for installed CFLs
- Average price paid for CFLs

7. CONCLUSIONS AND RECOMMENDATIONS

The Lighting Program has continued its strong performance in 2002 and 2003, despite the phasing out of the Coupon Campaign and a lessening of concern regarding energy supplies and prices as the energy crisis subsided. Based on the evaluation results presented in this report, we draw the following general conclusions.

- *The market for CFLs has not been transformed, but noticeable progress toward this goal has been achieved.* Significant progress toward some of the CFL market goals has been achieved and positive market effects for CFLs have been observed. As discussed below, awareness of CFLs is very high and CFL sales have continued to be strong despite the end of BPA's Coupon Campaign and the energy crisis. Despite these achievements, however, it is still too early to claim that the market for CFLs has been transformed. Although the majority of CFLs purchased are still installed, the consumer survey data show a general decline in consumer satisfaction with CFLs, and that the majority of CFLs removed have been replaced by incandescent bulbs. Significant barriers to initial and repeat purchase such as price, light quality, and compatibility with fixtures still need to be addressed and future program efforts should continue to focus on these areas.
- *Consumers do not associate the Energy Star label with CFLs at the levels observed for other Energy Star products.* Just under half of the retailers we surveyed in 2002 and 2003 indicated that customers were asking specifically for Energy Star products, and these were surveys of retailers that are actively involved with the Lighting Program. In addition, the results of the Northwest sample from the Consortium for Energy Efficiency (CEE) national Energy Star survey in Fall 2003 indicates that Energy Star brand recognition for CFLs is lagging behind other products. In the Northwest, 28 percent reported having seen the Energy Star label on a CFL, which is significantly higher than the 17 percent national average. Nevertheless, recognition for the Energy Star label for other appliances is much higher, with refrigerators at 60 percent, clothes washers at 55 percent, dishwashers at 51 percent, and computers at 42 percent. In addition, when asked "in the future, if you needed to buy a light bulb, how important would it be for you to buy one with an Energy Star label?", 21 percent of respondents in the CEE survey say "Very important" compared with 34 percent for appliances. Similarly, 40 percent said that this was "Not at all important" for lighting, compared with only 23 percent for appliances.

These responses indicate that there is still work to be done in getting consumers to make the link between CFLs and the Energy Star brand. Given the issues with product quality and consumer dissatisfaction, it is very important that the Energy Star brand management team work to improve the products that it labels, particularly in terms of light quality and lumen depreciation.

- *CFL sales remain strong and have been sustained for several quarters following the energy crisis.* Even in the absence of an immediate concern for energy supplies and without a widespread coupon campaign, CFL sales remained strong in 2002 and 2003. This sustained CFL sales volume suggests that higher levels of CFL sales can be sustained as retailers and consumers both begin to embrace CFLs. Based on the

estimated CFL sales and total lamp sales for the program territory, we estimate that market share for CFLs is about 9 percent for 2002 and 2003.

- *Consumer awareness of CFLs remains high.* Given the high levels of CFL sales, it is not surprising that consumer awareness of ENERGY STAR CFLs has remained high, as confirmed through all three waves of the consumer survey. Retailers interviewed as part of the retailer surveys also indicated that consumer awareness has increased and that more customers are actively seeking ENERGY STAR lighting. This is encouraging for the long term outlook for sustainable CFL sales and corresponds to one of the market progress indicators set for this program.
- *Overall consumer satisfaction with CFLs has declined over the program period.* CFL purchaser satisfaction ratings have shown progressive erosion since the first consumer survey was conducted in 2001. Although approximately 80 percent of CFL purchasers rate their satisfaction at 6 or higher on a 10-point scale, the proportion rating their satisfaction as a 9 or 10 has declined from 46 percent in 2001 to 29 percent in 2003. This finding underscores the critical importance of continued support for product quality testing and assurance programs.
- *Issues with light quality and dimness are causing some to switch back to incandescents.* Although based on very small survey sample sizes, it appears that CFL purchasers who have problems with light brightness or color are switching back to incandescents. While consumers appear to have been somewhat tolerant of CFL burnouts, this is not the case with light quality issues. Fortunately, this is an issue that the program is well positioned to address and has already taken steps in this direction through its newly designed Retailer Pocket Guide and its support of PEARL quality testing efforts.
- *CFL lamp burnouts appear to be less of an issue than light quality.* The lighting purchaser callback surveys show that CFL purchasers that have CFLs that burn out early are still purchasing CFL bulbs as replacements, although some are returning to incandescents. In addition, our callback surveys indicate that removals due to burnouts have been decreasing. Despite anecdotal evidence regarding high rates of CFL burnouts, this does not appear to be negatively affecting purchases in the short run. There is no reason to believe, however, that tolerance for burnouts will continue in the long term, as consumers that have repeated experiences with early bulb failures are likely to become frustrated with the product and switch back to incandescents.
- *Retailers are increasing or maintaining the levels and varieties of ENERGY STAR CFLs that they carry.* Both retailer survey waves show that retailers were planning to either increase or maintain the ENERGY STAR CFLs that they carry – both in number and variety. This indicates that lighting stocking practices promoted by the program are being sustained at least in the short run, which is one of the measures of market progress for this program.

Given these findings and the evaluation results included in this report, we make the following recommendations for the Residential Lighting Program and evaluation moving forward.

- *Increase program efforts to mitigate CFL lumen depreciation and to educate consumers on CFL color and brightness issues.* The lighting purchaser surveys show a disturbing decline in consumer satisfaction with CFLs. Consumers have consistently cited light quality and brightness issues as a primary source of dissatisfaction with CFLs, which can be the result of inaccurate wattage conversion charts or lumen depreciation over time once the lamps have been installed. Moreover, lighting quality issues seem to have a long-term detrimental effect on repeat purchase of CFLs, causing some consumers to switch back to incandescents. Program efforts should continue to address these problems by increasing the use among retailers of working lighting displays, accurate wattage conversion charts, and lighting color guides. In conjunction with this, the program should provide support for quality control activities (such as PEARL testing) that are working toward address lumen depreciation.
- *Expand CFL promotional efforts to grocery stores.* The consumer survey shows that one of the reasons why incandescents are purchased instead of CFLs is out of habit, which was cited by 26 percent of the respondents in the latest Call Back survey as to why they returned to purchasing incandescents after buying a CFL. The Wave I consumer survey also shows that 35 percent of respondents tend to purchase light bulbs at grocery stores, which are frequented far more often than the types of stores currently targeted by the program. Encouraging more grocery stores to carry ENERGY STAR CFLs will help reach these consumers.
- *Utilize the consumer surveys to estimate CFL sales within the program territory.* While ECOS has been exceptional at collecting CFL sales data from retailers, it is limited to those retailers that agree to provide them data and does not account for retailers that are outside the reach of the program. If program resources (and therefore ECOS data collection efforts) remain relatively constant while the number of retailers stocking CFLs and not providing sales data increases (as we would expect if consumers continue to demand CFLs), then by definition the overall share of the market covered by the data ECOS collects will likely fall.

For future evaluations, we recommend that a consumer survey sample utilizing a slightly larger sample be fielded and the survey results used to estimate CFL sales and market share for the program territory. This method likely will yield more accurate estimates of total CFL sales than the current system and will provide an independent check of the CFL sales numbers being collected as part of the program implementation.

- *Increase the callback survey sample.* By increasing the sample size of the general consumer survey, the evaluation should also be able to reach more respondents through the callback surveys. This will allow a more robust sample that we can use to determine trends in CFL purchases with more certainty. This is particularly important for understanding the reasons why consumers try CFLs and then switch back to incandescents in subsequent purchase occasions.
- *Continue efforts to track and mitigate early CFL burnouts.* The evaluation surveys indicate that consumers are currently tolerant of CFL bulbs that burn out early and are tending to stay with CFLs. There is no reason to believe that this trend should continue,

however, and repeated experiences with burnouts will likely cause consumers to switch back to incandescents. The Lighting Program should continue collecting burn out data through the Report Cards and work to increase retailer responses. Continued support of PEARL testing should also be a priority for the Lighting Program moving forward.

- *Dedicate additional resources to track pivotal cost-effectiveness model assumptions.* This was not a priority for the current evaluation and only lately has this become more of an issue with the publication of the Retrospective report on the Alliance programs. We recommend future evaluation research include an effort to determine baseline CFL sales, possibly through a survey in a baseline region that has limited exposure to CFLs. Other pivotal assumptions should also be addressed include CFL retention and installation rates, as these impact overall energy savings calculated for the program. Determining a consistent definition of program participation for retailers will also help address the attribution issue.
- *Refine measures of market progress.* Given the widespread sales of CFLs, tracking the number of CFL manufacturers is less relevant as a measure of program progress and is less important than the overall availability of quality product. We recommend that the number of CFL manufacturers be dropped as a progress indicator for this program. Given the issues with product quality issues discussed above, we recommend that consumer satisfaction with CFLs and decreasing numbers of complaints regarding CFL brightness and light quality both be added as measures of progress for Lighting Program.

8. APPENDIX A: GENERAL CONSUMER SURVEY AND CALLBACK SURVEY INSTRUMENTS

8.1 GENERAL CONSUMER SURVEY INSTRUMENT

NOTE1) A code of system missing (.) means the question was not applicable.2) Response categories with an asterisk are coded responses to open-end questions or codes added during coding.

3) -8 indicates respondent does not know and -9 indicates other missing data (e.g., refused).

4) Every question is a “Do Not Read” unless noted otherwise

RESPNUM Unique respondent number (QCID) _____

Zip Code: _____

Hello, my name is _____ calling on behalf of the Northwest Energy Efficiency Alliance. We’re conducting a study among households on home lighting preferences.

REASSURE: I want to assure you that this is not a sales call and that the information that you provide will be kept strictly confidential. This will only take about 5-10 minutes of your time.

If asked about the Northwest Energy Efficiency Alliance, say:

The Alliance is a non-profit organization which funds projects that encourage energy efficiency in the Northwest. Its Board of Directors has representatives from utilities, environmental groups, regulatory agencies, and energy-related private businesses. For more information you can visit the website at www.nwalliance.org.

May I please speak to the person who makes lighting purchase decisions in your household?

[CONTINUE OR ARRANGE FOR CALLBACK]

Screener Questions

S1 In the past twelve months, have you purchased any light bulbs or received free bulbs for your household?

- 1 Yes
- 2 No
- 99 Don't Know

S2 Have you ever heard of compact fluorescent light bulbs?

- 1 Yes [SKIP TO S3]
- 2 No
- 99 Don't Know

S2a Compact fluorescent bulbs are small fluorescent bulbs that fit in regular light bulb sockets. Compact fluorescent bulbs look different than standard bulbs. They are often made out of thin tubes of glass bent into loops. Have you ever heard of compact fluorescent light bulbs?

- 1 Yes
- 2 No
- 99 Don't Know

INSTRUCTIONS: IF S1 = 1 and S2=2 and (S2a=2 or S1=1) THEN T&T

[“Since we are interested in people who have purchased light bulbs in the last three months and are familiar with compact fluorescent light bulbs, your input won't be needed. Thanks for your time.”]

S3 How did you first learn about compact fluorescent light bulbs? [DO NOT READ]
[Accept multiples]

- 1 In store point of purchase materials
- 2 Friends or family
- 3 Advertising on television, on the Internet, in newspapers, in magazines
- 4 Sales person
- 5 Consumer reports
- 7 Energy Star Label
- 8 Utility (bill stuffer or other advertising/announcement)
- 9 Announcement by governor or other government official
- 10 Got one for free
- 77 Other – Specify
- 88 Refused
- 99 Don't know

<FREE> Have you received any compact fluorescent light bulbs for FREE in the mail?

- 1 Yes
- 2 No
- 99 Don't Know

S5 Have you purchased compact fluorescent light bulbs or received one in the mail for your household in the last twelve months?

- 1 Yes [CONTINUE]
- 2 No [SKIP TO S7]
- 99 Don't Know [SKIP TO S7]

S5a. How many compact fluorescent light bulbs have you purchased or received in the mail over the last twelve months?

INSTRUCTIONS:

IF S5 = 1 THEN GO TO RECENT CFL PURCHASER QUESTIONS (FL1)
IF S5 = 2 OR 98 AND S4 =1, GO TO OLD CFL PURCHASER QUESTIONS (FL19)
IF S1 = 1 AND S4 = 2 OR 98 AND S5 = 2 OR 98, THEN GO TO NON-CFL PURCHASER QUESTIONS (FL28)

Recent CFL Purchasers

FL1 Thinking about your most recent purchase, why did you purchase compact fluorescent light bulbs?

- 1 Reduce electricity bill
- 2 Responding to energy crisis
- 3 Extra cost for compact fluorescent bulb was minimal
- 4 Energy savings worth the extra up-front cost, acceptable payback
- 5 Cost savings worth the extra up-front cost, acceptable payback
- 5 It is the "right thing to do" (environmental/resource conservation benefits)
- 6 Other benefits make purchase worthwhile (specify other benefits in # 13 below)
- 7 Product works better/is higher quality
- 8 like to have new, high-tech products
- 9 Salesperson convinced me it was the best choice
- 10 To redeem a coupon
- 11 Friends/family suggested I purchase compact fluorescent
- 12 To try them out
- 79 Received free in the mail
- 77 Other (specify) _____
- 88 Refused

99 Don't Know

- FL1_1 First mention
- FL1_2 Second mention
- FL1_3 Third mention

FL2 Did you receive any coupons to assist in purchasing compact fluorescent bulbs?

- 1 Yes [CONTINUE]
- 2 No [SKIP TO FL3A]
- 88 Refused [SKIP TO FL3A]
- 99 Don't Know

FL3 Did you use a coupon when you purchased your compact fluorescent bulb(s)?
(this is a price per bulb in dollars)

- 1 Yes [SKIP TO FL3B]
- 2 No [SKIP TO FL3A]
- 88 Refused [SKIP TO FL3A]
- 99 Don't Know

If S6 ne 10

FL3a Thinking of your most recent purchase, how much did you pay for your compact fluorescent bulbs?

_____ (dollar amount) [SKIP TO FL8]

- 8 Don't know [SKIP TO FL8]
- 9 Refused [SKIP TO FL8]

If S6 ne 10

FL3b Of the bulbs you recently purchased, how many coupons did you redeem?

_____ (number)

- 8 Don't know [SKIP TO FL8]
- 9 Refused [SKIP TO FL8]

If S6 ne 10

FL4 Thinking about the most recently purchased compact fluorescent light bulb(s), what was the price of the bulb(s) **before** any discounts?

- _____ (dollars) [SKIP TO FL5]
-8 Don't know [SKIP TO FL4a]
-9 Refused [SKIP TO FL4a]

FL4a Would you say it was

- 1 less than \$6
- 2 \$6 - 10
- 3 \$11 - 15
- 4 more than \$15

If S6 ne 10

FL5 What was the value of the coupon you used?

- _____ (dollars) [SKIP TO FL6]
-8 Don't know [SKIP TO FL5a]
-9 Refused [SKIP TO FL6]

FL5a Would you say it was

- 1 less than \$3
- 2 \$3 - 6
- 5 greater than \$6

If S6 ne 10

FL6 On a scale of 1 to 10, where a 1 is "Not at all influential" and a 10 is "Very influential", how influential was the coupon in your decision to purchase a compact fluorescent bulb?

Not At All Influential												Very Influential	Don't Know	Refused
1	2	3	4	5	6	7	8	9	10	88	99			

If FL2 = 1

If S6 ne 10

FL7 Would you have purchased the bulb(s) without a coupon?

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

-9 Refused

FL8 Where did you install your compact fluorescent light bulb(s)?

(Accept multiples)

- 1 Kitchen
- 2 Dining Room
- 3 Living Room
- 4 Family Room
- 5 Master Bedroom
- 6 Other Bedrooms
- 7 Bathrooms
- 8 Closets
- 9 Hall
- 10 Utility Room
- 11 Garage
- 12 Outdoor Lighting
- 13 Did not install
- 77 Other
- 88 Refused
- 99 Don't Know

FL9. Thinking about your entire house, how many compact fluorescent light bulbs do you own (purchased at any time)?

_____ (number)

- 88 Don't know
- 99 Refused

FL10. How many of these compact fluorescent bulbs did you install?

_____ (number)

- 88 Don't know
- 99 Refused

FL11. Have you removed any of the compact fluorescent light bulbs?

- 1 Yes
- 2 No
- 88 Refused
- 99 Don't Know

If yes to previous question, ask:

FL11A. How many compact fluorescent bulbs did you remove?

For each of the bulbs you removed, please tell me the reasons why you removed the bulbs:

ACCEPT MULTIPLE RESPONSES

- FL11A_A Burnt out [# of bulbs _____]
- FL11A_B Not bright enough [# of bulbs _____]
- FL11A_C Did not like color [# of bulbs _____]
- FL11A_D Too long to start up [# of bulbs _____]
- FL11A_E Did not fit fixture[# of bulbs _____]
- FL11A_OTHER Other: _____ [# of bulbs _____]
- 99 Don't Know

Considering the compact fluorescent bulbs you removed, please tell me how many bulbs you disposed of in the following ways:

FL12A. Threw them in the trash [# of bulbs = _____]

FL12B. Returned them to the store for a refund [# of bulbs = _____]

FL12C. Returned them to the utility that sent them to you. [# of bulbs = _____]

FL12_OTHER.. Other [Describe] _____ [# of bulbs = _____]

FL12_D. How many CFLs did you dispose of in this manner?

FL15 Thinking about all of the compact fluorescent light bulbs you recently purchased, on a scale of 1 to 10, where a 1 is "Not at all satisfied" and a 10 is "Very satisfied", how satisfied were you with your compact fluorescent bulb?

Not At All Satisfied		w		Very Satisfied		Don't Know		Refused			
1	2	3	4	5	6	7	8	9	10	88	99

FL16 Are you dissatisfied with any of the CFLs for any reason?

- 1 Yes [CONTINUE]
- 2 No [SKIP TO FL17]
- 88 Refused [SKIP TO FL17]
- 99 Don't Know [SKIP TO FL17]

FL16a Which bulbs are you dissatisfied with?

- 1 Indoor
- 2 Outdoor
- 3 Fixture
- 77 Other (specify) _____
- 88 Refused
- 99 Don't Know

FL16b What is the reason for your dissatisfaction?

- 1 Buzzing/loud
- 2 Didn't like color of the light
- 3 Took too long to light up
- 4 Wouldn't work with a dimmer
- 5 Wouldn't work with a three-way switch
- 6 Wouldn't work with outdoors/in cold temperatures
- 77 Other (specify) _____
- 88 Refused
- 99 Don't Know

FL16C Have you returned any of the bulbs you have been dissatisfied with?

- 1 Yes [CONTINUE]
- 2 No [SKIP TO FL17]
- 88 Refused [SKIP TO FL17]
- 99 Don't Know [SKIP TO FL17]

FL16D How many did bulbs did you return?

_____ (number)

- 88 Don't know
- 99 Refused

FL16E1. What is the first reason that you returned the CFL bulbs?

FL16E1QTY. How many bulbs did you return for this exact reason?

FL16E2. Did you return bulbs for second reason?

FL16EQTY Did you return any bulbs for any other reason?

FL17 Relative to standard bulbs, are you more, less satisfied or as satisfied with your compact fluorescent bulb?

- 1 as satisfied
- 2 more satisfied
- 3 less satisfied
- 88 Refused
- 99 Don't Know

FL17a Why do you say that? (PROBE)

If S6 ne 10

FL18 Did you have any concerns about compact fluorescent light bulbs when you were deciding to make your purchase?

- 1 Encountered no difficulties
- 2 I was concerned that the energy efficient bulb was more expensive than the standard unit
- 3 I was concerned that the energy efficient bulb would not save enough energy to make it worthwhile
- 4 I was concerned about poor light quality
- 5 It was hard to find the *type/style/size* I wanted in compact fluorescent bulbs
- 6 It was hard to find the *brand* I wanted in compact fluorescent bulbs
- 7 I was concerned because I normally don't like to try new high-tech lighting equipment until they have been on the market for awhile
- 8 I was concerned that I didn't know the product well enough to decide

- 9 I had to spend a lot of time comparing costs/brands
- 10 I was worried that the energy efficient unit would not work as well as the standard unit
- 11 There were other competing priorities
- 12 I was uncertain that the savings would occur
- 13 I was worried that I did not have enough information to make an informed decision
- 14 I was not fully confident that I could trust the sales person or the sales pitch promoting the compact fluorescent bulbs
- 15 Other priorities more important
- 16 Wouldn't work with a dimmer
- 17 Wouldn't work with a three-way switch
- 18 Wouldn't work with outdoors/in cold temperatures
- 77 Other – specify
- 88 Refused
- 99 Don't know

- FL18_1** First mention
- FL18_2** Second mention
- FL18_3** Third mention

INSTRUCTIONS:

IF S4 = 1, THEN GO TO OLD CFL PURCHASERS QUESTIONS (FL19)

IF S4 = 2 OR 98, THEN GO TO FUTURE PURCHASE INTENTION QUESTIONS (FI1)

Non CFL-Purchaser

FL28 When you recently purchased your new light bulbs, why didn't you purchase a compact fluorescent light bulb?

- 1 Have never heard of CFLs
- 2 Costs too much to purchase
- 3 Won't save enough energy to make it worthwhile
- 4 Can't find the *type/style/size* I want in compact fluorescent bulbs
- 5 Can't find the *brand* I want in compact fluorescent bulbs
- 6 Don't like to try new high-tech products until they have been on the market for awhile
- 7 Moving/selling my home, thus won't accrue operating savings
- 8 Don't know the product well enough to decide
- 9 Would have to compare costs/brands
- 10 Standard product works better/is higher quality
- 11 Uncertain that savings will occur
- 12 Didn't have enough information to make an informed decision
- 13 Didn't trust salesperson or sales pitch promoting compact fluorescent bulbs

- 14 Did not think about energy efficiency when choosing
- 15 Was not aware that there was such a thing as an energy efficient light bulb
- 76 Other
- 77 Other
- 88 Refused
- 99 Don't know

- FL28_1** First mention
- FL28_2** Second mention
- FL28_3** Third mention

FL29 Thinking about when you recently purchased light bulbs, did you notice any lighting-related advertising or information materials displayed in the store for compact fluorescent light bulbs?

- 1 Yes [CONTINUE]
- 2 No [SKIP TO FI1]
- 88 Refused [SKIP TO FI1]
- 99 Don't know [SKIP TO FI1]

FL30 What type of compact fluorescent light bulb advertising or information materials did you notice?

(CHECK ALL THAT APPLY)

- 1 Lighting display with working lights
- 2 Display/materials at the end of the aisle
- 3 ads and/or other material in the lighting aisle
- 4 Other (Please Specify: _____)
- 77 Other
- 88 Refused
- 99 Don't know

FL31 What would you say were the main messages of the advertising/information materials?

- 1 Reducing energy bills
- 2 Energy efficiency is good for the environment
- 3 Energy Star
- 4 Understanding energy efficiency in general
- 5 Understanding the Energy Guide label
- 6 Operating costs over the life of the equipment
- 7 Energy savings over the life of the equipment
- 8 Availability of coupon
- 9 Availability of store rebate

- 10 Availability of manufacturer rebate
- 11 Appropriate size of the equipment
- 77 Other
- 88 Refused
- 99 Don't know

- FL31_1** First mention
- FL31_2** Second mention
- FL31_3** Third mention

Future Purchase Intentions

FI1 Do you think that you will purchase a compact fluorescent bulb in the next year?

- 1 Yes
- 2 No
- 88 Refused
- 99 Don't know

FI1a Why or why not?

FL_COUP Would you be likely to use a coupon to purchase the CFL?

- 1 Yes
- 2 No
- 88 Refused
- 99 Don't know

FI1b Would you be likely to purchase a compact fluorescent bulb in the future if no coupon is offered?

- 1 Yes
- 2 No
- 88 Refused
- 99 Don't know

Mercury Questions (Ask All Respondents)

M1. Are you aware that CFLs have a small amount of mercury in them?

- 1 Yes
- 2 No
- 99 Don't Know

If Yes, ask:

M2. Did you know that because of the mercury, CFLs require special treatment and should not be thrown out with your regular garbage? (If asked, disposal requires special handling similar to when households throw out batteries, paint, and used motor oil.)

- 1 Yes
- 2 No
- 99 Don't Know

M3. Would you be willing take your burnt out CFLs to a special disposal center, or would you prefer returning them to the store for disposal?

- 1 Disposal Center
- 2 Store
- 3 Neither
- 4 Other _____
- 99 Don't Know

Demographics

Before we finish, I have just a few more questions about your household to make sure we're getting a representative sample of residents.

D1 What type of home do you live in?

- 1 Single-family (attached or detached)
- 2 Apartment
- 3 Condo
- 4 Mobile home
- 77 Other
- 88 Refused
- 99 Don't know

D2 Do you own your home or rent?

- 1 Own
- 2 Rent
- 88 Refused
- 99 Don't know

D3 Including yourself, how many people live in your home? Please include children.

- 1 one
- 2 two
- 3 three
- 4 four
- 5 five
- 6 six
- 7 seven or more
- 88 Refused
- 99 Don't know

D4 What type of fuel does your home's heating system primarily use?

- 1 Electricity
- 2 Fuel Oil
- 3 Gas
- 4 Wood
- 77 Other
- 88 Refused
- 99 Don't know

D5 Which of the following describes your educational background?

- 1 Some high school
- 2 High school graduate
- 3 Trade or technical school
- 4 Some college
- 5 College graduate
- 6 Some graduate school
- 7 Graduate degree
- 88 Refused
- 99 Don't know

D6 Please tell me which of the following categories best describes your age. Are you ... ?

- 1 18-24
- 2 25-34
- 3 35-44
- 4 45-54
- 5 55-64

- 6 65 and older
- 88 Refused
- 99 Don't Know

D7 Which of the following best represents your annual household income (*from all sources in 2000, before taxes*)?

- 1 Less than \$20,000 per year
- 2 \$20,000-49,999
- 3 \$50,000-74,999
- 4 \$75,000-99,999
- 5 \$100,000 or more
- 88 Refused
- 99 Don't know

8.2 CALLBACK SURVEY INSTRUMENT

NOTE1) A code of system missing (.) means the question was not applicable.2) Response categories with an asterisk are coded responses to open-end questions or codes added during coding.

5) -8 indicates respondent does not know and -9 indicates other missing data (e.g., refused).

6) Every question is a “Do Not Read” unless noted otherwise

RESPNUM Unique respondent number (QCID) from old survey _____

CODING OF PAST RESPONDENTS:

Past CFL Purchaser / Free CFL Recipient: LIGHTTYPE = 1

Past Incandescent Purchaser: LIGHTTYPE = 2

Hello, my name is _____ calling on behalf of the Northwest Energy Efficiency Alliance. We’re conducting a study among households on home lighting purchases. Our records indicate that you answered our survey last year and we would like to ask you a few follow up questions. These questions will only take 2 or 3 minutes of your time.

REASSURE: I want to assure you that this is not a sales call and that the information that you provide will be kept strictly confidential.

If asked about the Northwest Energy Efficiency Alliance, say:

The Alliance is a non-profit organization which funds projects that encourage energy efficiency in the Northwest. Its Board of Directors has representatives from utilities, environmental groups, regulatory agencies, and energy-related private businesses. For more information you can visit the website at www.nwalliance.org.

May I please speak to the person who makes lighting purchase decisions in your household?

[CONTINUE OR ARRANGE FOR CALLBACK]

Old Compact Fluorescent Light Bulb Purchasers

If LIGHTTYPE = 1, goto Q1

If LIGHTTYPE = 2, goto Q15

1. Our records show that when we talked to you last time (Spring of 2002) you had purchased [# of compact fluorescent light bulbs from Old Survey] compact fluorescent light bulbs. Are all these bulbs still in use?

1 Yes

2 No

99 Don't Know

If Q1 = 1,99, goto Q6

If Q1 = 2, goto Q2

2. How many compact fluorescent bulbs did you remove?

3. For each of the bulbs you removed, please tell me the reasons why you removed the bulbs:

ACCEPT MULTIPLE RESPONSES

- 1 Burnt out [# of bulbs _____]
- 2 Not bright enough [# of bulbs _____]
- 3 Did not like color [# of bulbs _____]
- 4 Too long to start up [# of bulbs _____]
- 5 Did not fit fixture [# of bulbs _____]
- 6 Other: _____ [# of bulbs _____]
- 99 Don't Know

Note: Total # of bulbs from responses should equal answer from Q2

4. If you removed the compact fluorescent light bulbs, were they replaced with incandescent bulbs or compact fluorescent light bulbs?

- 1 Compact fluorescent light bulbs
- 2 Incandescents
- 99 Don't Know

5. Considering the compact fluorescent bulbs you removed, please tell me how many bulbs you disposed of in the following ways:

- 1. Threw them in the trash [# of bulbs = _____]
- 2. Returned them to the store for a refund [# of bulbs = _____]
- 3. Returned them to the utility that sent them to you. [# of bulbs = _____]
- 4. Other [Describe] _____ [# of bulbs = _____]

Note: Total # of bulbs from responses should equal answer from Q2

6. Thinking about only those compact fluorescent light bulbs that you had purchased when we spoke to you in our first survey 10 months ago, on a scale of 1 to 10, where a 1 is “Not at all satisfied” and a 10 is “Very satisfied”, how satisfied are you with your compact fluorescent bulbs?

	Not At All Satisfied							Very Satisfied	Don't Know	Refused		
	1	2	3	4	5	6	7	8	9	10	88	99

7. Have you purchased any new light bulbs in the past year since our last survey?

- 1 Yes
- 2 No
- 99 Don't Know

If Q7 = 2,99 goto Q17

If Q7 = 1, go to Q8

8. Were the new bulbs you purchased in the past year compact fluorescent light bulbs or incandescent bulbs?

- 1 Compact fluorescent light bulbs
- 2 Incandescents
- 3 Both incandescents and compact fluorescent light bulbs
- 99 Don't Know

If Q8 = 1,2,3, goto Q9

If Q8 = 99, goto Q17

9. How many bulbs total did you purchase in the past year?

- 1 Number of compact fluorescent light bulbs _____
- 2 Number of Incandescents _____
- 99 Don't Know

The remaining questions refer to just the bulbs that you purchased in the past year, since the last time we surveyed you.

If Q8 = 1, goto Q11

If Q8 = 2, 3 goto Q10

10. Why did you decide to purchase incandescent bulbs instead of compact fluorescent light bulbs?

- 1 Price / Compact fluorescent light bulbs too expensive
- 2 Compact fluorescent light bulbs not bright enough
- 3 Lighting color
- 4 Did not fit fixture
- 5 Compact fluorescent light bulbs take too long to start up
- 6 Compact fluorescent light bulbs not available where I shop for light bulbs
- 7 Other
- 99 Don't Know

If Q8 = 2, goto Q17

11. Did you use a coupon to purchase the compact fluorescent light bulbs?

- 1 Yes
- 2 No
- 99 Don't Know

12. Are all the compact fluorescent light bulbs you purchased still in use?

- 1 Yes
- 2 No
- 99 Don't Know

If Q12 = 1,99 goto Q16

If Q12 = 2, goto Q13

13. How many compact fluorescent bulbs did you remove?

Removed_____

14. For each of the bulbs you removed, please tell me the reasons why you removed the bulbs:

ACCEPT MULTIPLE RESPONSES

- 7 Burnt out [# of bulbs _____]
- 8 Not bright enough [# of bulbs _____]
- 9 Did not like color [# of bulbs _____]
- 10 Too long to start up [# of bulbs _____]
- 11 Did not fit fixture[# of bulbs _____]
- 12 Other: _____ [# of bulbs _____]
- 99 Don't Know

Note: Total # of bulbs from responses should equal answer from Q13

15. Considering the compact fluorescent bulbs you removed, please tell me how many bulbs you disposed of in the following ways:

- 1. Threw them in the trash [# of bulbs = _____]
- 2. Returned them to the store for a refund [# of bulbs = _____]
- 3. Returned them to the utility that sent them to you. [# of bulbs = _____]
- 4. Other [Describe]_____ [# of bulbs = _____]

Note: Total # of bulbs from responses should equal answer from Q13

16. Thinking about all of the compact fluorescent light bulbs you purchased in the past year, on a scale of 1 to 10, where a 1 is “Not at all satisfied” and a 10 is “Very satisfied”, how satisfied were you with your compact fluorescent bulbs?

Not At All Satisfied										Very Satisfied	Don't Know	Refused
1	2	3	4	5	6	7	8	9	10	88	99	

17. Do you plan to purchase any compact fluorescent light bulbs in the upcoming year?

- 1 Yes
- 2 No
- 99 Don't Know

18. Will you purchase compact fluorescent light bulbs in the next year if coupons are not available?

- 1 Yes
- 2 No
- 99 Don't Know

That's all the questions I have for you today. On behalf of the Northwest Energy Efficiency Alliance, thank you very much for helping us with our study!

Old Incandescent Purchasers

19. Have you purchased any new light bulbs in the past year since we last surveyed you?

- 1 Yes
- 2 No
- 99 Don't Know

If Q19 = 1, goto Q20

If Q19 = 2,99 goto Q29

20. Were the new bulbs you purchased compact fluorescent light bulbs or incandescent bulbs?

- 1 Compact fluorescent light bulbs
- 2 Incandescents
- 3 Both incandescent and compact fluorescent light bulbs
- 99 Don't Know

If Q20 = 1,2,3 goto Q21

If Q20 = 99, goto Q29

21. How many bulbs total did you purchase?

- 1 Number of compact fluorescent light bulbs _____
- 2 Number of Incandescents _____
- 99 Don't Know

If Q20 = 1, goto Q23
If Q20 = 2,3 goto Q22

The remaining questions refer to just the bulbs that you purchased in the past year, since the last time we surveyed you.

22. Why did you decide to purchase incandescent bulbs instead of compact fluorescent light bulbs?

- 1 Price / Compact fluorescent light bulbs too expensive
- 2 Compact fluorescent light bulbs not bright enough
- 3 Lighting color
- 4 Did not fit fixture
- 5 Compact fluorescent light bulbs take too long to start up
- 6 Compact fluorescent light bulbs not available where I shop for light bulbs
- 7 Other
- 99 Don't Know

If Q20 = 2, goto Q29

23. Did you use a coupon for the compact fluorescent light bulbs you purchased ?

- 1 Yes
- 2 No
- 99 Don't Know

24. Are the compact fluorescent light bulbs you purchased in the past year still in use?

- 1 Yes
- 2 No
- 99 Don't Know

If Q24 = 1,99 goto Q28

If Q24 = 2, goto Q25

25. How many compact fluorescent bulbs did you remove?

Removed_____

26. For each of the bulbs you removed, please tell me the reasons why you removed the bulbs:

ACCEPT MULTIPLE RESPONSES

- 13 Burnt out [# of bulbs _____]
- 14 Not bright enough [# of bulbs _____]
- 15 Did not like color [# of bulbs _____]
- 16 Too long to start up [# of bulbs _____]
- 17 Did not fit fixture[# of bulbs _____]
- 18 Other: _____ [# of bulbs _____]
- 99 Don't Know

Note: Total # of bulbs from responses should equal answer from Q25

27. Considering the compact fluorescent bulbs you removed, please tell me how many bulbs you disposed of in the following ways:

- 1. Threw them in the trash [# of bulbs = _____]
- 2. Returned them to the store for a refund [# of bulbs = _____]
- 3. Returned them to the utility that sent them to you. [# of bulbs = _____]
- 4. Other [Describe]_____ [# of bulbs = _____]

Note: Total # of bulbs from response should equal answer from Q25

28. Thinking about all of the compact fluorescent light bulbs you purchased in the last year, on a scale of 1 to 10, where a 1 is "Not at all satisfied" and a 10 is "Very satisfied", how satisfied were you with your compact fluorescent bulb?

	Not At All Satisfied									Very Satisfied	Don't Know	
<u>Refused</u>	1	2	3	4	5	6	7	8	9	10	88	99

29. Do you plan to buy any compact fluorescent light bulbs in the upcoming year?

- 1 Yes
- 2 No
- 99 Don't Know

If Q29 = 1, ask Q30.

If Q29 = 2,99 Thank and terminate

30. Will you buy compact fluorescent light bulbs in the upcoming year if coupons are not available?

- 1 Yes
- 2 No
- 99 Don't Know

That's all the questions I have for you today. On behalf of the Northwest Energy Efficiency Alliance, thank you very much for helping us with our study!

9. APPENDIX B: 2002 AND 2003 RETAILER SURVEY RESULTS

Retailer Survey

Name:	Address:
Store:	Field Rep:

Introduction

As part of the continuing effort to update and improve the Lighting Program, we are very interested in getting the retailer's perceptions of what is going on in the market. We are also interested in learning about your plans in the upcoming year for selling Energy Star CFL bulbs and fixtures.

CFL Stocking

1. Has the number of models and brands of all CFL bulbs you carry increased, decreased, or stayed the same over the past year?

Increased _____	2002	2003	Decreased _____	2002	2003	Same _____
Increase	64%	41%	Decrease	8%	14%	Same
	28%	44%				
Sample Size	131	133				

2. Do you expect the number to increase decrease, or stay the same in the coming year?

Increase _____	2002	2003	Decrease _____	2002	2003	Same _____
Increase	30%	27%	Decrease	15%	7%	Same
	55%	66%				
Sample Size	129	131				

3. Has the number of models and brands of Energy Star CFL bulbs you carry increased, decreased, or stayed the same over the past year?

	Increased _____	Decreased _____	Same _____
	2002	2003	
Increase	68%	40%	
Decrease	5%	11%	
Same	27%	49%	
Sample Size	131	136	

4. Do you expect the number to increase decrease, or stay the same in the coming year?

	Increase _____	Decrease _____	Same _____
	2002	2003	
Increase	40%	27%	
Decrease	12%	6%	
Same	48%	67%	
Sample Size	130	131	

5. Are sales of CFL bulbs seasonal? Yes _____ No _____

	2002	2003
Yes	42%	43%
No	58%	57%
Sample Size	129	133

If yes, what months have the highest CFL sales?

	2002	2003
Fall	29%	48%
Winter	71%	52%
Sample Size	42	63

6. Do you carry Energy Star CFL fixtures? Yes _____ No _____ If so,
what types?

	2002	2003
None	35%	46%
Torchieres	25%	17%
Hardwired	31%	29%
Portable	7%	6%
Other	2%	2%
Sample Size	170	156

Torchieres _____ Hardwired _____ Portables _____ Other (get type)

CFL Promotions

7. Have you had successful CFL promotions in the past? Yes _____ No _____

	2002	2003
Yes	78%	70%
No	22%	30%
Sample Size	130	121

If yes, list 3 reasons why they were successful:

Reasons given include lower sale prices, friendly staff, timing, rep support, location, adequate inventory, and number of customers in store.

8. Have you had CFL promotions that were unsuccessful? Yes _____ No _____

	2002	2003
Yes	14%	15%
No	86%	85%
Sample Size	128	109

If yes, list reasons why unsuccessful:

Reasons given for unsuccessful promotions included price (still too high), lack of participation by local utilities, poor timing, and lack of perceived energy crisis.

9. Do you expect your promotions of Energy Star CFL bulbs to increase or decrease in the upcoming year?

Increase _____	Decrease _____	Same _____
	2002	2003
Increase	46%	29%
Decrease	16%	5%
Same	39%	66%
Sample Size	129	130

10. Do you expect your promotions of Energy Star CFL fixtures to increase or decrease in the upcoming year?

Increase _____	Decrease _____	Same _____
	2002	2003

Increase	34%	14%
Decrease	9%	5%
Same	57%	80%
Sample Size	107	91

11. Do you plan for the Change-A- Light promotion on an annual basis? Yes _____ No _____

	2002	2003
Yes	33%	21%
No	67%	79%
Sample Size	109	123

12. What do you think is the long-term effect of the Coupon Campaign on Energy Star CFL bulb sales?

	Increase sales _____	Decrease sales _____	No effect _____
	2002	2003	
Increase	85%	88%	
Decrease	2%	3%	
Same	14%	10%	
Sample Size	117	120	

Customer Questions

13. Since the Lighting Program has been in place, have you noticed customers becoming more aware and more knowledgeable about Energy Star CFL bulbs

Yes _____ No _____

	2002	2003
--	------	------

Yes	91%	86%
No	9%	14%
Sample Size	133	129

14. Do think that customers have become more aware and knowledgeable of Energy Star CFL fixtures?

	Yes _____	No _____
	2002	2003
Yes	47%	53%
No	53%	47%
Sample Size	107	100

15. Are customers asking specifically for Energy Star products? Yes _____ No _____

	2002	2003
Yes	47%	50%
No	53%	50%
Sample Size	129	125

CFL Complaints

16. On average, how many complaints do you get per month regarding CFL bulbs?

2002	2003
215.5	39

17. How do you handle CFLs that have been returned?

Don't accept returns _____ Provide refund _____ Provide replacement bulb _____ Other _____

	2002	2003
Don't accept returns	1%	1%
Refund	33%	30%
Replacement bulb	65%	67%
Other	1%	2%
Sample Size	162	170

17a. What do you do with returned bulbs? [DON'T READ CHOICES]

Send back to manufacturer/distributor _____ Put in garbage _____ Recycle _____ Special Disposal _____

Other _____

	2002 N/A	2003
send back to manufacturer/distributor		48%
put in garbage		36%
recycle		8%
special disposal		4%
other		4%
Sample Size		141

18. Are the customers generally satisfied with whatever action you take on returned CFLs?

Yes _____ No _____

	2002	2003
Yes	100%	99%
No	0%	1%
Sample Size	107	131

19. Are you satisfied with the service you receive from your distributors on returned CFLs?

Yes _____ No _____ If no, why not? (One retailer claimed the distributor was “slow”)

	2002	2003
Yes	97%	94%
No	3%	6%
Sample Size	107	126

20. Do you consider the number of complaints and returns of CFL bulbs normal or higher than normal compared to other products?

	Normal _____	High _____
	2002	2003
High	10%	9%
Lower	25%	19%
Normal	65%	72%
Sample Size	126	132