

# **Baring the Torchierie: Everything You Wanted to Know About Energy Efficient Torchieries in the Northeast But Were Afraid to Ask**

*Kimberly Ihrig, National Grid USA  
Elizabeth Titus, Northeast Energy Efficiency Partnerships, Inc.  
Robert Ziemer, XENERGY*

## **ABSTRACT**

Results of a recent evaluation featuring a comprehensive telephone survey show that participants in a Northeast compact fluorescent (CFL) torchiere lighting program with a distinctive marketing campaign have high energy savings. The study suggests that turn-in and retail promotions advertising the safety benefits of the CFL torchieries result in more replacements of halogens than other incandescent fixtures. The study also tells us where customers put their CFL torchieries (what room), as well as their weekly usage patterns and the usage intensities of the new and replaced torchieries. It also captures what customers do with the replaced torchieries.

The sales of CFL torchieries in the Northeast have surged recently, due to a combination of product development, media attention about the fire hazards of halogen torchieries, and a variety of successful promotions by utilities. The promotions include retail rebates, mail order distribution, and turn-in events. By measuring and relating energy impacts from different promotion strategies, this paper illustrates some of the human dimensions of marketing and the effects of promotion strategies. It concludes that better understanding of customers and consumption patterns can help influence program design, marketing, distribution, and utilities' expectations of energy savings from efficiency programs.

## **Introduction**

CFL torchieries have been promoted for their energy savings and as a safer alternative to halogen torchieries. In the Northeast, many utilities have been offering rebates for the purchase of CFL torchieries. The delivery of the torchieries has been accomplished through three channels: turn-in events, retail catalogs, and rebate coupons. Four utilities sponsoring the regional Residential Lighting Program in association with the Northeast Energy Efficiency Partnerships, Inc. (NEEP) also sponsored an evaluation of energy impacts from CFL torchieries<sup>1</sup>. The evaluation analyzed a sample of data based on a population of over 58,000 torchieries from programs operating in parts of four northeastern states (New Hampshire, Massachusetts, Rhode Island, and New York) in 2001.

---

<sup>1</sup> Utilities sponsoring the evaluation include: Fitchburg Gas and Electric Company, Long Island Power Authority, National Grid USA, and NSTAR Electric.

## Motivation for the Study

In addition to estimating energy savings associated with CFL torchieres, the evaluation characterized participants in the Residential Lighting Program. The purpose of this paper is to develop a deeper understanding of utility customers who use CFL torchieres. Their awareness and understanding of the ENERGY STAR<sup>®</sup> brand and CFL technology are examined as well as their torchiere usage patterns. This study also examined differences between customers participating in different delivery strategies.

## Background

The compact fluorescent (CFL) torchiere entered the U.S. lighting market in 1998. It is a relatively new product that has been promoted for its energy savings and as a safer alternative to the halogen torchiere. The halogen torchiere floor lamp has been popular in recent years because of its appearance, light distribution, availability, and low cost. It provides an economical source of reflected indirect lighting as an alternative to conventional direct lighting sources such as table lamps and ceiling fixtures. Two major disadvantages of the halogen torchiere lamp are its relatively high energy consumption and the high operating temperature of its bulb, which often presents a fire hazard. To address the safety and energy concerns, the CFL torchiere was introduced.

Beginning in 1998, utilities that sponsor the Northeast Energy Efficiency Partnerships (NEEP) Residential Lighting Program began promoting CFL torchieres regionally by offering retail displays and rebates, featuring them in efficient lighting catalogs, organizing turn-in events, and funding various advertising and awareness campaigns. The NEEP Residential Lighting Program is a joint utility program that develops and implements regional initiatives to transform the market for ENERGY STAR lighting products (both fixtures and bulbs) by changing consumer understanding of and demand for these products. The sponsoring utilities<sup>2</sup> offer customers the opportunity to purchase CFL light bulbs and fixtures at substantial discounts.

Delivery of the torchieres through the NEEP program was accomplished through three channels: turn-in events, retail catalogs, and rebate coupons. Turn-in events occurred several times throughout the year. The utilities sponsored special promotions at various torchiere retailers such as home improvement stores. These events encouraged replacing halogen torchieres with CFL torchieres. During these events consumers could bring in a halogen torchiere and exchange it for a CFL torchiere. Additional torchieres and other CFL products were also available for purchase at these events. The retail catalog component of the program consisted of sales catalogs that featured torchiere lamps and other CFL lamps and fixtures that could be ordered via telephone, mail or over the Internet at a discount off of regular retail prices. The torchieres carried a \$20 discount. The rebate coupon component offered \$20 instant rebate coupons, which were available in lighting display areas at

---

<sup>2</sup> Sponsoring utilities include: NSTAR Electric, Fitchburg Gas and Electric Company, National Grid USA, Long Island Power Authority, Northeast Utilities, United Illuminating and Efficiency Vermont.

participating retailers, for qualifying CFL torchieres. These coupons were redeemable at the checkout counter.

## Methodology

Databases of sales and turn-ins from various promotions were analyzed to estimate program operating parameters, including the number of participants, state in which the product was sold, and number of products sold. The database contained a population of over 58,000 torchieres from programs operating in parts of four northeastern states. Massachusetts represented the greatest participation with 51% of torchieres, followed by Rhode Island with 30%, New York with 18% and New Hampshire with less than 1%. More than half of the torchieres, 56%, were distributed through the turn-in events, followed by catalog sales at 33% and rebate coupons at 12%. XENERGY conducted telephone interviews with samples of 450 participants in the turn-in program and 401 participants in the rebate/coupon and catalog component. The information gathered from these surveys was used to assess customer characteristics and estimate impacts.

## Results

### Demographics, Awareness and Understanding of CFL Products

Respondents who participated in the catalog, rebate and turn-in programs were relatively homogeneous with respect to age, income, household size and other demographic characteristics. However, they differ somewhat in their familiarity with CFL products. On average, customers who have purchased bulbs or fixtures have five to six CFL bulbs and/or three to four CFL fixtures installed their home. As shown in Tables 1 and 2, the turn-in program attracted more customers who had not previously purchased any CFL bulbs or fixtures.

**Table 1. Prior Bulb Purchases**

Prior to participating in the program, had you purchased any CFL light bulbs?	Program			% of Total
	Catalog	Rebate	Turn-In	
Yes	58%	48%	40%	46%
No	41%	51%	59%	53%
Don't know	1%	1%	1%	1%
Total # of responses	201	200	450	851

As shown in Table 3, less than one-fourth of the respondents had heard of CFL torchieres prior to the program. Of those who were familiar with the product, the largest proportion of respondents was catalog purchasers and the smallest was turn-in participants.

**Table 2. Prior Fixture Purchases**

Prior to participating in the program, had you purchased any CFL light fixtures?	Program			% of Total
	Catalog	Rebate	Turn-In	
Yes	16%	13%	8%	11%
No	83%	86%	91%	88%
Don't know	1%	2%	1%	1%
Total # of responses	201	200	450	851

**Table 3. Prior Knowledge of Compact Fluorescents**

Prior to learning about the program, had you ever heard of CFL torchieres?	Program			% of Total
	Catalog	Rebate	Turn-In	
Yes	29%	24%	17%	22%
No	70%	75%	82%	77%
Don't know	1%	1%	1%	1%
Refused	1%	0%	0%	0%
Total # of responses	201	192	434	827

The respondents shared environmental values, as evidenced by the ratings indicating strong agreement with the first two statements in Table 4. Interestingly, they also express strong interest in the appearance of home furnishings. To a slightly lesser extent, they also tend to share interest in innovative products and do-it-yourself home maintenance, as evidenced by the ratings of 3.4 to 3.6 for the statements in c and d in the Table 4. The responses did not vary much by program. Turn-in participants are slightly more interested in doing fix-up projects and in the appearance of their homes. This is not surprising since two thirds of the turn-in events took place at hardware and/or home improvement stores.

**Table 4. Significant Behaviors**

Question: Using a scale of 1 - 5 (5=strongly agree), indicate to what extent you agree or disagree with these statements.	catalog	rebate	turn-in
a: I make sure to compare the energy efficiency ratings of different products when I buy a major appliance such as an air conditioner, refrigerator, water heater, clothes washer or dryer.	4.4	4.2	4.3
b: I recycle as much material as I can through programs in my community and at my workplace.	4.5	4.4	4.5
c: I spend much of my free time doing fix-up projects around the house.	3.1	3.4	3.5
d: I enjoy telling my friends about new kinds of products I have tried.	3.5	3.5	3.6
e: I am very particular about the way my home furnishings look.	3.9	4.1	4.3

Survey respondents understand the benefits of CFL technology. When asked about energy savings of CFL products, over 75% of respondents said CFLs use less than standard incandescents. Over 33% said they think CFL bulbs use one third as much electricity as incandescent bulbs. Seventy-nine percent think CFLs last longer than incandescents, and one – third think they last five to ten times as long. The differences in the level of understanding were very slight between participants from the three types of promotions. More of the catalog participants understood the benefits than did the rebate or turn-in participants.

## Results of Marketing

The catalog and turn-in programs have educational benefits and may be important distribution channels for those who might otherwise have less access to purchase torchieres and other CFL products. The marketing benefits of the catalog are suggested by the fact that more catalog purchasers were familiar with CFL torchieres prior to the program. Other educational benefits of the catalog are suggested by the fact that more of the catalog purchasers understood the benefits of CFL products and had purchased bulbs and fixtures prior to the torchiere promotion. The turn-in promotion, on the other hand, appears to be a successful strategy for attracting those who are unfamiliar with CFL technology of any kind. Turn-in purchasers had the least prior knowledge of torchieres or CFLs and after participating in the program they purchased more additional CFL products through the Residential Lighting Program.<sup>3</sup> The survey explored whether participants in the torchiere program purchased additional CFLs within a year after their participation. Of those who had never purchased CFLs before participation in the program, 19% had purchased additional CFLs after they participated in the torchiere program. While this is encouraging in terms of bringing new consumers to the CFL market, the consumers who purchased CFLs prior to receiving the torchieres were twice as likely to purchase CFLs after participation. (In other words, 38% of pre-program CFL consumers purchased CFLs after participating in the program).

The survey also asked whether the respondents were familiar with the ENERGY STAR<sup>®</sup> brand. Overall 71% claimed familiarity with ENERGY STAR<sup>®</sup> yet only 22% had ever heard of CFL torchieres, which suggests that respondents are more familiar with the brand than with applications of the CFL technology. Thus, ENERGY STAR<sup>®</sup> is an important aspect of marketing regardless of marketing channel.

## Usage Patterns

As shown in Table 5, on average, between one and two torchieres were purchased per customer. As shown in Table 6, most torchieres obtained through the program are installed and in use. The installation rate ranged from 91 to 98%. The catalog purchasers have the highest installation rate (98%) among customers who purchased one product. Customers who purchased multiple products had installation rates ranging from 70% (rebate) to 78% (turn-in).

## Torchieres Not in Service

As shown in Table 6, relatively few torchieres purchased through the program (3 to 9%) are not installed and in service. In another question the survey also explored reasons why torchieres were not being used (never installed or not currently in service); the top 3 reasons include:

---

<sup>3</sup> Spillover rates from the respondents, shown in Table 12, indicate subsequent purchases of CFL products through the program. Although not statistically significant, spillover from the turn-in program is higher than from the other promotional strategies.

- It was broken when received
- The product can't be used with a dimmer switch
- The product failed prematurely - light began to dim

Other reasons cited included dissatisfaction with the delay in light coming on, dissatisfaction with the color or brightness of the light, and that the light burned out. Interestingly, equal proportions (4%) found the light too bright and not bright enough.

**Table 5. Number of Torchieres Purchased**

How many new torchieres did you purchase or receive through the program in the year 2000?					
Program Delivery	Mean	Minimum	Maximum	Number of Respondents	Total Number of Torchieres
Catalog	1.78	1	4	201	357
Rebate / Coupon	1.86	1	8	200	372
Turn-in	1.68	1	6	450	754

**Table 6. Installation Rate (Single Purchase)**

(single purchase) Is the torchiere you purchased currently installed and in use in your home?	Program			% of Total
	Catalog	Rebate	Turn-In	
Yes	98%	91%	91%	92%
No	3%	9%	9%	8%
Total # of Responses	80	109	239	428

When torchieres were removed from service, most customers (64%) kept the product. Twelve percent threw them away and 10% returned them to the store.

### What Would Have Been Installed

As shown in Table 7, less than 14% of respondents would have replaced their existing light with some kind of CFL if they had not installed the CFL torchiere. Over one third of the respondents would have used an incandescent replacement and 26% would have used a halogen lamp.

**Table 7. Type of Bulb Displaced**

What kind of fixture would you have most likely installed in the room if you had not installed the new torchiere?	Program			% of Total
	Catalog	Rebate	Turn-In	
Incandescent	43%	35%	30%	35%
Halogen	17%	26%	31%	26%
Don't know	16%	19%	20%	19%
Compact Fluorescent	16%	13%	13%	14%
Tube Fluorescent	4%	3%	4%	4%
Other	4%	3%	2%	3%
Refused	0%	0%	0%	0%
Total # of responses	300	283	613	1196

**Location**

The majority of respondents (51 to 56%) installed torchieres in living rooms and family rooms as shown in Table 8. The bedroom and den are also popular locations for torchieres.

**Table 8. Location of Torchiere**

In which rooms have you installed the new compact fluorescent torchiere(s)?	Program			% of Total
	Catalog	Rebate	Turn-In	
Living Room/Family Room	56%	55%	51%	53%
Dining Room	6%	4%	3%	4%
Den/Office	15%	11%	19%	16%
Kitchen	0%	1%	0%	0%
Bedroom	19%	22%	23%	22%
Bathroom	0%	0%	0%	0%
Basement	2%	2%	1%	2%
Other	3%	5%	2%	3%
Don't Know	0%	0%	0%	0%
Refused	0%	0%	1%	0%
Total # of responses	311	287	623	1221

**Hours of Use**

Several types of information on hours of use were obtained from respondents as part of the survey, including the usage level of the CFL torchiere relative to the fixture replaced and relative to other lights in the room, as well as the actual pattern of usage (average hours the light is on per day). As shown in Table 9, the majority (75 to 83%) of respondents use the new torchiere the same amount of time as the fixture they replaced<sup>4</sup>. However, it is interesting to note that 16% of respondents used the new torchiere more hours than the

<sup>4</sup> As discussed in more detail in following sections, respondents use a new CFL torchiere between 21 and 25 hours per week.

fixture replaced and 33% used the other lights in the room fewer hours since installing the new torchiere. Because this finding was not anticipated when the study was designed, whole-room energy impacts from the torchiere were not assessed. Tables 10 and 11 further describe changes in the usage of the torchiere and effects on other fixtures. To adequately estimate the total energy impact of the CFL torchiere based on a whole-room approach, one would need to inventory the wattages as well as hours of use for the other lights in the room before-and after installation of the torchiere. Complete information on the other lights in the room with the torchiere was not collected in this study.

**Table 9. New Usage Level**

Are you using the new torchiere, more or fewer hours than the fixture replaced?	Program			% of Total
	Catalog	Rebate	Turn-In	
More	21%	13%	15%	16%
Fewer	4%	4%	6%	5%
The same	75%	83%	77%	78%
Don't know	1%	1%	1%	1%
Refused	0%	1%	0%	0%
Total # of responses	145	192	563	900

**Table 10. Change in Hours of Use**

About how many hours more or less is this fixture [the torchiere] being used?					
	Mean	Standard Deviation	Minimum	Maximum	Number of responses
More	2.76	2.25	1	12	115
Fewer	2.67	4.11	1	24	33

**Table 11. Effects on Usage of Other Fixtures**

Since installing the new torchiere have you been using the other lights in the room...	Program			% of Total
	Catalog	Rebate	Turn-In	
For More Hours	11%	13%	32%	25%
For Fewer Hours	42%	29%	30%	32%
The same number of hours	39%	42%	24%	30%
There are no other lights	8%	16%	14%	13%
Total # of responses	36	31	122	189

In addition to characterizing the hours of use of the torchiere and the fixture it replaced, this study characterized the level of usage (full wattage versus dimmed levels). The survey asked what lighting level was used most often in the old fixture – highest, lowest, or in between. The survey also asked what percentage of the time the CFL torchiere is in use at the highest level and what percentage of the time is the CFL torchiere in use at the lowest level. This information, combined with manufacturers’ information about energy consumption at various lighting levels of the CFL and other torchieres, was incorporated in the mean savings per unit and average wattage reduction results used to develop estimates of energy impacts.



## Impacts

Gross savings from the sale of over 58,000 torchieres from programs operating in parts of four northeastern states in 2001 amounted to over 16.7 MWh, or in the range 284 to 293 kWh per torchiere, depending on the program delivery strategy. Net savings can be calculated as follows:

$$\text{Mean savings per unit (kWh)} * \text{number of units} * \text{Installation Rate} * (1 + \text{Spillover Rate} - \text{Free rider Rate})$$

Impact parameters associated with each promotion type – rebate, catalog, and turn-in - are summarized in Table 12. As the table shows, overall, the mean per unit energy savings for torchieres obtained through turn-in events is similar to savings for torchieres acquired through the catalog or rebates. As expected, the wattage reduction for the turn-in lamps is greater than those acquired through rebate or catalog sales. The variation in wattage reduction is also less. The turn-in results have tighter confidence intervals for hours of use and the estimated mean per unit savings. However, the greater wattage reduction for turn-ins is tempered by lower operating hours. It is important to note that these represent slightly conservative estimates of the energy savings associated with installation of these fixtures. This is because the survey revealed that respondents tended to use less of the other lighting available in a room when the CFL torchiere was in place.

**Table 12. Summary of Impact Parameters**

	<b>Catalog</b>	<b>Rebate</b>	<b>Turn-in</b>
Mean per Unit Savings (kWh)	288	293	284
<i>90% Confidence Interval</i>	$\pm 23.5$	$\pm 23.9$	$\pm 12.2$
Average Wattage Reduction (watts)	251	271	286
<i>90% Confidence Interval</i>	$\pm 6.8$	$\pm 4.9$	$\pm 2.0$
Installation Rate	87%	85%	91%
<i>90% Confidence Interval</i>	$\pm 2.8\%$	$\pm 3.0\%$	$\pm 1.7\%$
Average Hours of Use/Week	25	23	21
<i>90% Confidence Interval</i>	$\pm 1.9$	$\pm 1.7$	$\pm 0.9$
Free-ridership rate	2.4%	4.1%	4.8%
<i>90% Confidence Interval</i>	$\pm 1.4\%$	$\pm 2.2\%$	$\pm 1.4\%$
Spillover rate	5.4%	5.8%	6.2%
<i>90% Confidence Interval</i>	$\pm 2.0\%$	$\pm 2.2\%$	$\pm 1.5\%$
Net savings per unit (Mean per Unit Savings * Installation Rate * (1+Spillover-Free ridership))	258	253	262
Number of Surveys	201	200	450

For the purposes of this study, a free rider is a customer who would have purchased one or more CFL torchieres on their own, without the benefit of the program. Free ridership is measured as the percentage of products that would have been purchased by free riders relative to total products sold among the sample of respondents. It is an indicator of the extent to which the program affected the customer's decision to obtain the torchiere through the program. Larger free-ridership values indicate a low degree of influence of the program

on the participants. The information to estimate this parameter is based on a question sequence in the telephone survey. To qualify as a free rider, respondents generally need to report that:

- They were aware of the measure's existence prior to receiving notice of the program;
- They knew where to obtain the products;
- They planned to buy the products on their own at full market price.

Spillover rate is a measure of the extent to which customers purchased additional CFL products as a result of their experience with the program. Spillover is measured as the percentage of products purchased through the Residential Lighting Program as a result of their torchiere purchase relative to the total products purchased by the sample of respondents. As with free ridership the information to estimate this parameter is based on a question sequence in the telephone survey designed to identify and quantify the extent of spillover. Spillover is estimated for a participant if she/he purchased any of three types of energy efficient lighting products (CFL bulbs, CFL fixtures, or torchieres) as a result of the program, after receiving the torchiere.

As shown in Table 12, both spillover and free ridership rates are low, ranging from two to six percent. Hence, they have a small influence on net energy savings.

### **Comparison with Other Torchiere Study Results**

Many utilities, universities, and other organizations are promoting CFL torchieres. Despite the rapid growth in this technology since 1998, there are no directly comparable studies of energy impacts and consumers' usage patterns with these products.

Based on the available literature, the energy impacts are similar, albeit slightly higher than in other studies. Average wattage reduction reported in other sources ranges from 194 to 245. Energy savings results were not provided. A study conducted by Sacramento Municipal Utility District (SMUD) and Lawrence Berkeley National Laboratory (LBNL) in 2000 monitored torchieres in 60 households to assess potential customer acceptance of CFL torchieres. The household's halogen torchiere was monitored for one month, then replaced and the CFL torchiere was monitored for one month. This study found that the CFL product saved approximately 85% of the halogen usage, similar to the 83% savings in this study when a halogen was replaced. It also found that customers dimmed the torchieres over 50% of the time they were in use, and that both halogens and CFL torchieres were dimmed in roughly equal proportions. As expected due to the technology, there was a much wider range of wattages at which the halogen torchieres were operated, compared to the CFL torchieres (Lindeleaf, 2002).

Calwell (2000) also presents results on hours of use for torchieres, based on self-reported survey data (as are the data in this study) from turn-in events in PG&E's service territory. The result, 4.5 hours/day, or 31.5 hours/week, is 25 – 50% higher than the findings from our study.

No measured findings on measure life exist. Calwell (2000) assumes a design life of 12 years for CFL torchieres, based on an assumption that the torchiere will be in use through two CFL lamp life cycles. However, he notes that this assumption represents a ceiling, since

many households redecorate or move in shorter time horizons and that would reduce the expected life of a portable fixture such as a torchiere. In its May 2000 publication that surveys the lighting quality, costs and manufacturers of torchiere products on the market, the Lighting Research Center notes that within five years even a CFL torchiere that retails for \$150 will be more cost-effective than a halogen torchiere<sup>5</sup>. Typically halogen torchieres sell for much less.

## Discussion and Conclusions

Following are insights from the assessment of energy impacts in this study include.

*Energy impacts from CFL torchieres vary slightly with promotional strategies.* The highest average wattage reduction (286 W/unit) is associated with turn-ins and the lowest (251 W/unit) is from catalog sales. This difference is due to the fact that the CFL torchiere obtained in a turn-in program is by the nature of the event more likely to replace an existing (relatively high wattage) halogen torchiere. When other impact parameters are considered, the differences blur. Mean net savings per unit range from 284 to 293 kWh/unit. While the differences are probably not statistically significant, the net impacts from turn-in are slightly higher than from the other promotional strategies.

*Future impact assessments of torchieres should be based on a whole-room analysis.* One recommendation from this study is that future impact assessments of torchieres should be based on a whole-room lighting analysis rather than on assumptions about one-to-one replacements. This recommendation is based on the findings that indicate that many respondents use other lights in the room differently (more or fewer hours than before) after they have installed the CFL torchiere, even though most respondents use the torchiere for about the same amount of time as the fixture that was replaced. Overall 32% of respondents used other lights in the room for fewer hours than they did before the CFL torchiere was installed, and 25% used other lights for more hours. To adequately estimate the total energy impact of the CFL torchiere, one would need to inventory the wattages as well as hours of use for the other lights in the room before-and after installation of the torchiere. Complete information on the other lights was not collected in this study.

With respect to some of the market effects of these products, this study found :

*Different marketing channels – catalog, rebate, and turn-in – are valuable for attracting different kinds of customers.* Many of the findings from this survey suggest that turn-in programs attract customers with little or no prior experience with CFLs, for example. Fifty-nine percent of respondents from the turn-in sample had never purchased CFL bulbs and 82 percent had never heard of CFL torchieres prior to participating in the turn-in promotion. Furthermore, the fact that the highest average wattage reductions are for the turn-in promotion suggests that more halogen torchieres are replaced through this promotion than others.

*Both free ridership and spillover are relatively small impacts (less than ten percent).* However, it is important to remember that they are measures of effects from program participants only. The low free ridership may be due to the fact that CFL torchieres were

---

<sup>5</sup> The Lighting Research Center study assumed the torchieres were operated at full power 4 hours per day and they assumed \$0.10 per kWh operating cost.

relatively new to the market at the time of the program and if rebates continue the rates may increase as more people become aware of the technology. To understand the larger market effects of the CFL torchiere promotions, it would be helpful to also assess purchases by nonparticipants – for example, other customers who learn about the products by word of mouth. Calwell (2000) notes that this effect could be very significant.

*Additional information (i.e. further study) is needed to fully assess the penetration and impacts of CFL torchieres in the lighting market overall.* Ideally this would include tracking the relative market shares of CFL and halogen torchieres and other portable fixtures over time to assess changes in customers' purchasing behavior. Some first steps toward this methodology exist in California, where utilities have established market share tracking of CFL bulbs.

In conclusion, better understanding of customers and consumption patterns can help influence program design, marketing, distribution, and utilities' expectations of energy savings from efficiency programs.

## References

- Calwell, Chris. 1998. "Utility Blitz Boosts ENERGY STAR<sup>®</sup> Torchieres." Home Energy, Volume 15, Number 5. September/October.
- Horowitz, Noah and Chris Calwell. November 2, 2000. Proposal for Inclusion of a Torchiere Power Use Standard in the California Energy Commission's Title 20 Rulemaking. NRDC.
- Lindeleaf, Warren. 2002. Personal communication.
- National Lighting Product Information Program. May 2000. LightingAnswers: Alternatives to Halogen Torchieres. Volume 5, Issue 1, Albany, NY.
- XENERGY. 2001. Impact Study of CFL Torchieres. Prepared for Northeast Energy Efficiency Partnerships, Inc. and its sponsors. Burlington, MA.

## Acknowledgements

The authors of this paper would like to acknowledge the support and assistance of Dave Leishman of Applied Proactive Technologies, Inc., Tim Brown and Brad Steele of Energy Federation Inc., as well as Stephen Bonanno of NSTAR, Margaret Cush Grasso of KeySpan, and Greg Rahe representing Fitchburg Gas and Electric.