

# **Lighting for Tomorrow: What Have We Learned and What About the Day After Tomorrow?**

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## **ABSTRACT**

This paper describes Lighting for Tomorrow (LFT), a program designed to reduce the use of residential lighting energy, sponsored by the American Lighting Association, the Consortium for Energy Efficiency, and the U.S. Department of Energy. Primarily, LFT organizes a design competition for residential decorative lighting fixtures using energy-efficient light sources. This paper discusses the reasons for development of the design competition, its effectiveness and the intended outcomes of the effort. The two competitive rounds completed to date are described in terms of their specific messaging, rules, and direct results. Experience to date is synthesized relative to the intended outcomes, including new product introductions, increased awareness of energy efficiency within the lighting industry, and increased participation by lighting showrooms in marketing and selling energy-efficient light fixtures. The paper draws out several lessons learned from the experience of the LFT partnership to date. Finally, it describes how LFT's current year (2006) program has been designed to respond to lessons from the previous competitions, to feedback from the industry, and to changes in lighting technology.

## **Background**

Nationally, lighting represents approximately 18 percent of residential electricity consumption in the United States. While progress has been made in the screw-in CFL market, 85 percent of residential fixtures still contain incandescent bulbs. Residential light fixtures represent a sizeable opportunity for energy savings (approximately 66 percent per fixture). According to the U.S. Environmental Protection Agency (EPA), ENERGY STAR<sup>®</sup>-qualified residential lighting fixtures had achieved market penetration of only about 4 percent as of 2003, in terms of unit sales. About half of all residential lighting fixtures are sold through lighting showrooms, while the other half are sold through "big box" retail and lighting distributors direct to builders.

By 2002, the ENERGY STAR Residential Light Fixture program, launched in 1998, had more than 5,000 qualified fixtures. While several decorative lines were included, most of the qualified fixtures were more basic styles, such as round, surface-mounted ceiling fixtures, recessed downlights, and linear ceiling-mounted fixtures. Such fixtures are typically sold through "big box" retail and electrical distributors. Feedback from lighting showrooms during the 2002 American Lighting Association (ALA) annual conference indicated that their opinions about existing ENERGY STAR-qualified lighting boiled down to "not showroom quality" (Hoffman et al. 2002). Although it had a growing presence in the home improvement retail channel, ENERGY STAR lighting had not yet cracked the lighting showroom channel. This presented a need and an opportunity to change the image of energy-efficient lighting.

Prompted by the high potential energy savings and the challenge of changing retailer and consumer preconceptions about energy-efficient residential lighting, the Lighting for Tomorrow

(LFT) partnership was formed. Since its inception in late 2002, the program has been co-sponsored by three organizations: ALA, the Consortium for Energy Efficiency (CEE), and the U.S. Department of Energy (DOE), represented by Pacific Northwest National Laboratory (PNNL). About 25 CEE member utility, state, and regional energy-efficiency programs contribute directly to the program. The original objectives of LFT were to:

- encourage the market introduction of decorative, energy-efficient lighting fixtures and ceiling fans for the residential sector, and
- increase the promotion and sale of decorative, energy-efficient lighting fixtures and ceiling fans through existing distribution channels.

To achieve these objectives, LFT challenged lighting fixture manufacturers to design beautiful, decorative fixtures that happened to use an energy-efficient light source. The programmatic vehicle selected was a juried design competition.

### **Why a Design Competition?**

The LFT organizers selected the design competition approach because the key market barriers identified through research and industry feedback were primarily related to aesthetic concerns. Surveys among consumers, retailers, and manufacturers in the Northwest and Northeast in 1999-2000 had identified negative perceptions of fluorescent fixtures, including concerns about lighting quality, availability of desired styles, higher prices, and lack of variety of fixtures (McCormick et al. 2000). Recognizing that decorative lighting is a fashion industry led the organizers to a focus on strategies to impact aesthetic perceptions.

A design competition can explicitly invite and reward good design, good looks, and style. It is based on the same subjective measures the industry values, while other possible approaches, such as technology procurement or ENERGY STAR qualification, are based solely on energy efficiency and technical performance. A design competition can make itself newsworthy by announcing winners, holding award ceremonies, and publishing high-quality photos of attractive products targeting both trade and general consumer publications. Further, the organizers were able to draw on a significant body of knowledge and experience in Europe: the European Design Competition “Lights of the Future” had been underway for several years and had already yielded important lessons about the importance of on-going promotion of the winners and links to retailers. (Conti, Bertoldi, Berrutto 2002).

The design competition was intended to complement other efforts to promote energy-efficient residential lighting, especially the ENERGY STAR Residential Light Fixture program, the basis for utility and regional programs nationwide. LFT requires participating fixtures to be capable of meeting the current ENERGY STAR residential light fixture criteria as a minimum technical requirement.

### **Intended Outcomes**

LFT’s organizers developed the design competition and supporting activities to achieve the following outcomes:

1. New, energy-efficient lighting fixture designs are introduced into the market.

2. The residential lighting industry demonstrates increased awareness of energy-efficient lighting.
3. More lighting showrooms carry energy-efficient fixtures.

## Overview of Competitions Completed to Date

### First Competition

The first LFT competition was launched in December 2002. The effort was carried out in two phases. Entrants were asked to submit designs “on paper” by March 2003. More than 150 designs were evaluated by the judging panel, which announced 24 finalists at the May 2003 ALA conference in New Orleans. Then, in January 2004, the finalists submitted working prototype fixtures, from which four winners were selected. Winners were announced at the May 2004 ALA conference in Tucson.

The key message of the initial competition was “energy-efficient residential lighting fixtures can be beautiful and stylish.” The focus was on changing retailer perceptions about the lack of style, variety, and quality of fluorescent fixtures by showing decorative applications in the dining, kitchen, and living areas of homes, and not only in utilitarian applications such as laundry rooms and garages.

The competition invited stylish, innovative fixture designs from manufacturers, designers, and students. The call was put out through press releases to the residential lighting trade press, ALA member manufacturers, and ENERGY STAR partners. The competition was structured to consider individual fixture designs and was open to designs at all stages of development, from drawings and renderings to prototypes to production fixtures already on the market. The only technical requirement was that the fixtures use a lamp-ballast combination capable of meeting the ENERGY STAR Residential Light Fixture criteria in force at that time (Version 3.2).

The first competition recognized several fixtures that ably demonstrated the style and beauty possible with energy-efficient fixture design. The “Aliante” fixture by Ivalo Lighting, based in Pennsylvania, displayed high style, as well as high efficiency.

It was awarded “Best Design” in the paper design phase of the competition. This precisely engineered and designed fixture uses a T5 high-output lamp and a dimmable electronic ballast. Definitely a “high end” fixture, it is priced well beyond most residential lighting budgets. It set the mark high in terms of style, achieving the intended effect and garnering early media attention for LFT, including coverage by *Sunset Magazine*. During the year following LFT’s recognition of the Aliante, Ivalo succeeded in placing the fixture in a dozen lighting showrooms around the U.S.

At the prototype stage of the competition, the “Salem” fixture by American Fluorescent Corporation based in Illinois, emerged as the overall winner. The designer, Stephen Blackman, responded to the compact fluorescent light source by creating a fixture that uses traditional materials in a completely new way. He recognized that the cooler operation of CFLs, compared to incandescent lamps, would allow the use of real wax as a diffuser material. Further, American Fluorescent was able to manufacture the fixture for a competitive retail price of around \$150. A full-page photo of the Salem fixture ran in *Sunset Magazine* and was the subject of a short feature on the Home & Garden Television (HGTV) program “American Home” in January 2005. The fixture was sold through Lowe’s and Menard’s.

“Between2Shapes” designed by Soren Momsen of Denmark was one of three second-place winners in the first LFT competition. Like the Aliante, it addressed the objective of changing perceptions about energy-efficient lighting. Sculptural and organic, employing translucent porcelain, and housing a high-efficacy long CFL and fully dimmable electronic ballast, it can also rotate 180 degrees in both the horizontal and vertical planes. This allows it to provide uplighting, wall washing, task lighting, or general ambient lighting. While not a style or price point appropriate for the do-it-yourself chain stores or even for the typically very traditional U.S. lighting showroom market, Between2Shapes provided a different image and opened up new possibilities for energy-efficient lighting. In addition to residential lighting trade press, this fixture was the only LFT winner to be pictured in a story in *Interior Design* magazine.

## Second Competition

The second competition built upon the momentum established in 2003-04, but responded to several lessons learned and feedback received from participants and observers. Key changes were as follows:

- 1) Instead of individual fixtures, entrants were invited to submit fixture “families” in order to provide more complete solutions for lighting showrooms and builders to market to customers. Indoor fixture families included three or more applications (e.g., ceiling-mount, chandelier, wall sconce, etc.; ceiling fans with light kits were also permissible).
- 2) Both indoor and outdoor fixture families were invited. Outdoor fixtures had not been included in the first competition, but showrooms and manufacturers both indicated this was a growth area. Outdoor fixture families included at least two applications.
- 3) A technology innovation category invited entrants to address affordable dimming, ballast replacement, multiple wattage capability, improved color, and other technical improvements.
- 4) The timeline was shortened relative to the first competition. Instead of two phases, there was one phase requiring submission of a prototype. The competition was announced at the January 2005 International Lighting and Accessories Market (Dallas Market), and winners were announced in September 2005 at the ALA Annual Conference in Miami.
- 5) Entrant eligibility was restricted to manufacturers. Designers and students were eligible to participate only if they had a manufacturer partner who could provide a working prototype in time for the deadline.

The message of the second competition was “energy-efficient lighting is ready for decorative applications.” The organizers intentionally focused on encouraging fixture families that were market-ready and that would appeal to lighting showrooms and homebuilders.

Three families of fixtures received top awards in the 2005 competition. These are “Ferros” by Lithonia Lighting, “Windows Collection” by Justice Design Group, and “Eureka” by American Fluorescent (see Figures 1, 2, and 3). All of these winners have been or will soon be brought to market by the manufacturers, and two of the three appeared at the January 2006 Dallas Market. (“Eureka” is expected to launch at the June 2006 Dallas Market.) Each of these winning families contains three to six matching fixtures for various applications (pendant, chandelier, sconce, flush mount, etc.).

**Figure 1. Ferros by Lithonia Lighting**



**Figure 2. Eureka by American Fluorescent**



**Figure 3. Windows Collection by Justice Design Group**



In addition to the winners, 11 fixture families were recognized with Honorable Mention awards or finalist status. These include designs by Fire & Water, Good Earth Lighting, DFI Lighting, Kichler, and Progress Lighting, and additional designs by American Fluorescent and Justice Design Group. Specific information on market availability of these fixtures can be found in the 2005 LFT catalog available online at [www.lightingfortomorrow.com](http://www.lightingfortomorrow.com).

A technology innovation award was also presented to American Fluorescent for its approach to affordable dimming. The company used an “on-board” dimming switch incorporated into a decorative finial of a pendant fixture. American Fluorescent showcased this

technology at the January 2006 Dallas Market and is planning to incorporate it into additional fixtures in late 2006.

## Progress on Intended Outcomes

The first two LFT competitions have demonstrated progress toward the intended outcomes:

- 1) New energy-efficient designs were introduced to the market as a direct result of the competition. In addition to their winning Salem design, American Fluorescent introduced two other designs that were finalists in the first competition: the Oslo pendant and the Santa Cruz chandelier. In January 2005, American Fluorescent introduced more than 10 new energy-efficient fixture families for the lighting showroom market, building on the designs originally submitted to LFT. This pattern continued in 2006, when the company showed additional new designs at the Dallas Market. American Fluorescent credits the LFT competition with their successful entry into the decorative market. Lithonia Lighting is a well-established leader in commercial/architectural lighting. They have used the LFT competition as a way to assist their expansion into the residential decorative market. Lithonia's winning Ferros fixture family was introduced in response to the 2005 competition and was featured during a special reception in Dallas in January 2006.
- 2) Excellent coverage by the residential lighting trade press, specifically *Residential Lighting*, *Home Lighting and Accessories*, and *Home Furnishings News*, has helped to raise awareness within the industry about energy-efficient lighting. Award ceremonies and displays at the 2003, 2004 and 2005 ALA annual conferences further raised the LFT profile with ALA member manufacturers and showrooms. Coverage in *Residential Lighting* continued in 2005, with the "Windows Collection" by Justice Design Group appearing on the cover of the September issue. In fact, energy efficiency was the focus of the entire issue, including a four-page feature on LFT, two pages on the ENERGY STAR program, and two pages on California's Title 24 standards. Additional placements highlighting the 2005 winners appeared in both trade and consumer press, including *Natural Home & Garden Magazine*, *Sunset Magazine* and local newspapers in Chicago and southern California.
- 3) In terms of increased stocking and sales of energy-efficient lighting by lighting showrooms, LFT organizers have not collected data from retailers. However, by an informal count, the number of fixture manufacturers displaying ENERGY STAR or CFL based fixtures at the January 2006 Dallas Market increased by about 50% compared to the previous year. Many manufacturers visited by LFT organizers during the market said they were offering energy-efficient fixtures in response to ENERGY STAR, California's Title 24 standards, dark sky (light pollution) concerns, and/or LFT. LFT organizers are currently fielding a baseline survey to gauge lighting showroom familiarity with energy-efficient fixtures, stocking practices, and average monthly sales. A second survey will be fielded in late 2006 to determine whether the stocking and sales of efficient lighting have increased.

## Key Lessons

### Create a Partnership with Industry

LFT has been able to build recognition within the decorative lighting industry because of the partnership with ALA, which represents lighting fixture manufacturers, ceiling fan manufacturers and lighting showrooms where these products are sold. ALA has developed a very high level of credibility and trust with their members over the past decade by increasing their membership, offering high-quality training and professional development, a well-attended annual conference, and excellent representation on national issues affecting the decorative lighting industry. ALA made a commitment to energy efficiency as an issue of fundamental importance to the industry by partnering with the ENERGY STAR program and as a co-sponsor and organizer of LFT. The competition has been featured on the agenda of the ALA annual conference since its inception, covered in the ALA periodical “Lightrays,” and promoted at the twice-yearly Dallas Markets.

ALA helped CEE and DOE connect with manufacturers and retailers who are key players in the decorative lighting industry, but who had not participated in the ENERGY STAR program before. ALA has highlighted LFT work during its bi-annual Manufacturer Steering Committee and Showroom Steering Committee meetings. This has allowed LFT to get feedback from leaders in the decorative lighting industry serving on these committees. Contacts made through ALA constituted the base for the active Fixture Fan Working Group, which meets quarterly to provide input to the LFT program process and helps organizers to keep the program relevant as market conditions change. The group consists of fixture manufacturers and energy efficiency program sponsors, with more limited but growing participation by lighting retailers.

### Work to Reduce Common Barriers

With the success of the initial design competitions, LFT has evolved to serve as a broader forum for addressing market barriers facing energy-efficient lighting. Manufacturers that have participated in the competitions have begun to communicate concerns and ideas to the LFT organizers, working from the firm base of trust and confidence they have in the ALA as their trade association. This has developed into a candid and useful on-going conversation about how to address market and technical barriers. Two examples of specific market and technical issues that LFT has helped to address in the past two years are described below.

**Communicating color.** A key barrier to the increased adoption of CFLs and fixtures, identified in 2004, is difficulty in communicating the color of efficient light sources to consumers. LFT addressed this issue in two ways during 2005.

First, it provided a forum for efficiency programs and fixture manufacturers to advise a research project on the topic that was undertaken by EPA, DOE, and the major lamp manufacturers, represented by the National Electrical Manufacturers Association (NEMA). The research tested a draft system of communicating correlated color temperature (CCT) to consumers using a series of circles shaded with color ranging from light blue to light yellow. As part of that effort, LFT circulated the research plan, interim report, and draft final report to LFT sponsors and members of the Fixture Fan Working Group and solicited input during several conference calls. The input that was gathered during these calls was then shared with the

research organizers, helping to inform the project and ensure that the findings would meet the needs of these lighting stakeholders.

Second, LFT organizers helped the Lighting Research Office (LRO) promote a symposium held in February 2006 on the subject of light and color. The meeting highlighted the EPA/DOE/NEMA research project findings and provided a venue to vet the results with a larger constituency of lighting industry representatives. Out of the symposium came several ideas for improving or replacing the current system for light source color rendering and better communicating light and color information to lighting specifiers and consumers. An industry task force is working to establish consensus on the ideas and proceed with implementation.

**The GU-24 base.** Early in the planning process for LFT, organizers had identified pin incompatibility issues as barriers to the manufacture of pin-based CFL light fixtures. Fluorescent fixtures use lamps that connect to a ballast via one of several different pin configurations in use by various manufacturers. The ballast, in turn, needs to fit into a socket built into the fixture. While sockets were standardized by wattage and ballast type, this categorization resulted in many different socket types, not one type as with the screw-based incandescent socket. ALA sponsored a brainstorming workshop on the issue in January 2004 that included LFT organizers, EPA, and industry representatives. Participants recommended developing a new, low-cost universal line voltage socket that would standardize the connection between lamp, ballast, and fixture.

After the meeting, EPA issued a request for proposals for the socket design. Entrants agreed that the selected design would be available to all parties. LFT organizers served on the judging panel that reviewed proposals. One design was chosen, and subsequently designated the GU-24 base. The GU-24 base is now well integrated into the ENERGY STAR fixture program. EPA reports that approximately one-third of all new qualified products use the base. Nearly all the entries in the 2005 LFT competition used this base, and several manufacturers told us “this is what makes it possible for us to produce ENERGY STAR fixtures.” Further, the base type is currently moving through the ANSI standardization process, which should further bolster its position as the accepted universal line voltage socket type for ENERGY STAR fixtures. The GU-24 base development process is a good example of the role LFT can play in working with stakeholders to address and resolve common barriers.

## **Respond to Change**

LFT organizers engage in a nearly constant process of evaluating and reacting to both technical and market conditions that impact energy-efficient fixtures. Lighting technologies and market conditions are changing rapidly. Recent changes and developments include:

- new Title 20 and Title 24 building energy efficiency standards in California,
- new ENERGY STAR Residential Light Fixture criteria (version 4.0),
- development and implementation of the GU-24 base,
- the national ENERGY STAR lighting program outreach to electrical distributors,
- advancements in dimming control technology for CFLs,
- growth in the ENERGY STAR Homes program, including greater use of the Advanced Lighting Package and a proposal to incorporate a lighting requirement starting in 2009,
- the development of new solid state light sources, and



- lighting and equipment standards resulting from the 2005 federal Energy Policy Act.

The LFT program has been able to respond to these changes in part because of its yearly planning process. Each fall, LFT organizers meet to revamp the program, which is then launched the following January. Prior to the planning meetings, organizers engage in a variety of research tasks that draw upon the expertise represented by their organizations. For example, ALA is charged with evaluating manufacturer participation and retailer activity promoting efficient lighting. CEE provides information on efficiency program activity, state regulations, and ENERGY STAR program changes, while PNNL provides technology status and information on federal programs.

In 2005, fixture manufacturers participating in the Fixture Fan Working Group suggested that LFT organizers consider a more inclusive competitive process in which a larger number of manufacturers and products would be featured in a widely distributed publication. This idea became one of the mainstays of the 2006 program plan (see below).

Organizers' response to the improving technical performance of solid state lighting provides a final illustration of this lesson. In the 2003, 2004, and 2005 fixture design competitions, LEDs were eligible only as a secondary light source in a fixture that used a fluorescent primary light source. In 2006, however, organizers launched a separate design competition for fixtures that use LEDs as the sole light source (see below).

## **The Future of LFT**

Organizers see an important continuing role for LFT in bringing the decorative lighting and efficiency industries together through activities such as providing recognition for leaders that combine efficiency and style, education on the appropriate use of new technologies, and guidance to efficiency programs on fixture promotion.

At the September 2005 CEE Industry Partners Meeting, participants agreed that LFT can continue to play a valuable role in hastening the development of the efficient, decorative fixture industry. The majority of sponsors were pleased with the progress that LFT had made so far. They were also pleased that the focus has broadened to include more types of fixtures (suitable for both big box stores and showroom channels) and more technologies (specifically solid-state lighting). The 2006 program incorporates several important changes along these lines.

## **Yearbook of ENERGY STAR Fixtures**

Previous LFT efforts have focused on increasing the number of decorative, ENERGY STAR-qualified fixtures and ceiling fans that are produced by manufacturers. Organizer discussions with industry representatives have suggested that this work, bolstered by the California Title 24 standards, has yielded a significant, positive change. Manufacturers that had never before offered high-efficacy products, such as Kichler, are now offering full product lines that meet ENERGY STAR requirements. LFT organizers, with industry feedback, have concluded that the focus should shift from solely encouraging the introduction of new fixtures to encouraging their placement and sale at the retail level.

Industry feedback suggests that the LFT design competitions and associated press coverage have increased interest in LFT participation among a wide variety of manufacturers. Also, past experience with LFT winners has demonstrated that manufacturers recognized by the

program have done extensive marketing of their products on their own. Therefore, an inclusive approach – one that recognizes more than a handful of manufacturers – should increase the number of companies actively marketing their efficient product lines to retailers.

In addition, manufacturers have told organizers that it is the promotion associated with having won a design competition, not the cash award, which has been the most valuable aspect of past LFT activities. Therefore, organizers have developed a modified approach that would offer this valuable recognition to manufacturers while being more resource-efficient for sponsors.

Winners will be announced at the ALA conference in Las Vegas in September 2006. LFT organizers hope to recognize at least twice as many fixture families compared to the 15 featured in the 2005 LFT catalog. Selected designs will be featured in a “yearbook” of the best energy-efficient fixture families, as determined by a judging panel including lighting showrooms, designers, homebuilders, home décor magazines, and energy efficiency experts. LFT plans to print 10,000 copies of the yearbook, which will be mailed to retailers and homebuilders, and distributed at the Dallas Market, the International Builders Show, Light Fair, and other trade events during 2007. Because more entries will be included, planners expect designs to run the gamut from popular traditional styles to transitional to cutting-edge contemporary. In addition to showcasing a large selection of decorative ENERGY STAR fixtures, the Yearbook is intended to be an educational resource, with information on technical developments and proper application of CFL light sources.

Organizers have given significant thought to strengthening ties between the national-level activities pursued by LFT organizers and the local efficiency programs. Programs can either co-brand and print additional copies of the Yearbook or insert information on their local efficiency program offerings. Copies of the Yearbook will be provided to CEE, ALA, and DOE partners who can then use the document in program outreach to retailers, builders, or other large purchasers of fixtures, many of whom are unaware of the new ENERGY STAR offerings.

Because manufacturer contact information, suggested retail price (by category), fixture/fan dimensions, and model number will be required as part of a product submission, the Yearbook can also be used as an ordering resource for retailers. LFT will target retailers in follow-up communications including articles in the ALA newsletter, trade press stories, promotion at the ALA conferences, and information on the LFT website.

### **Solid State Lighting Prototype Competition**

In keeping with LFT’s focus on emerging technologies, the organizers developed a solid-state lighting (SSL) competition as part of the 2006 program.

The organizers believe the time is right to develop such an activity for several reasons. Although SSL technology is still in its infancy with regard to general illumination, it is improving rapidly in terms of light output, luminous efficacy, and quality. For certain niche applications, well-designed systems using current or near-term white/amber LEDs have the potential to save energy and provide high-quality lighting service. A range of new LED products are being introduced into the market, with widely varying performance claims. LFT can play an important role in encouraging the use of LEDs in appropriate, energy-saving applications and perhaps avoiding some of the problems that characterized the early use of CFLs.

Additionally, the small size, durability, and point-source characteristics of LEDs present new design possibilities unachievable with traditional light sources. LFT provides the forum to

encourage designers and manufacturers to begin using high-efficacy LEDs in appropriate fixtures and applications to achieve lighting quality and energy efficiency.

Specifically, LFT's activities are designed to do the following:

- Educate LFT stakeholders (including light source manufacturers, fixture manufacturers, designers, showrooms, and energy efficiency programs) about SSL technology status, technical concerns, and unique characteristics.
- Inform stakeholders about efficient "quality" near-term applications of SSL technology.
- Help to familiarize stakeholders with SSL technology and products.
- Identify LFT as a source of high-quality, objective SSL manufacturer and retailer information for the decorative residential market segment.

To achieve these objectives, LFT will pursue two activities in 2006:

1. The prototype competition will invite LED fixtures in three niche lighting applications: 1) under-cabinet and in-cabinet, 2) desk and task, and 3) outdoor porch, step, and pathway. The prototype fixtures will be installed in their intended applications and evaluated by a panel of experts in the areas of LED technology, lighting designers, LED testing and measurement, and lighting energy efficiency. Winners will be selected on the basis of lighting quality and energy efficiency.
2. A design charette (workshop) will be held during the ALA Annual Conference in Las Vegas in September 2006 and will provide a forum for fixture manufacturers to learn about current LED technology from experts and to explore how it can be uniquely incorporated into fixture applications.

## Conclusions

Since its inception in 2002, LFT has demonstrated that by working together to advance the market for decorative energy-efficient fixtures, common goals can be met. The competitions were designed to address the market barrier of lack of available "showroom quality" energy-efficient lighting. The 2003-04 design competition addressed this barrier by requesting elegant, energy-efficient designs and recognizing designers and prototype manufacturers with monetary awards and promotional efforts including press releases, announcements at conferences, use of websites, and promotion through LFT partners. In 2005, the competition was revised to a shorter timeline, requiring entry of prototype or existing fixtures rather than paper designs, adding outdoor lighting, adding a technology innovation award, and requiring that manufacturers submit a family of fixtures rather than individual fixtures. The first two competitions appear to be meeting objectives: many new ENERGY STAR lighting fixture families have been introduced. The competitions have received excellent media coverage by the residential lighting trade press, as well as *Sunset Magazine*, HGTV, and local news outlets. About 50% more fixture manufacturers displayed ENERGY STAR fixtures at the January 2006 Dallas Market as at the previous year's market.

Organizers' awareness of and responsiveness to the lessons learned in early program cycles has improved the effectiveness of the program over time and established LFT as a source of energy-efficient residential lighting fixture information and a forum for addressing market barriers. Future goals include increasing retailer awareness with a 2006 design competition

which will promote a broader selection of winners in a energy efficient lighting Yearbook. A second competition will seek new designs in solid state/LED lighting.

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