



Working Together, Advancing Efficiency

Consortium for Energy Efficiency Residential Lighting Initiative

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CONSORTIUM FOR ENERGY EFFICIENCY

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1 Background

Residential lighting accounts for approximately 17%¹ of residential electricity use and approximately \$8 billion² per year in consumer electricity bills. The environmental impact is also significant representing 3% of all U.S. carbon dioxide emissions, 4% of SO_x and 2% of NO_x³. It is estimated that the use of currently available energy-efficient lighting technologies could reduce electricity use attributed to lighting by 50-75%⁴. These impacts are substantial and exactly the reason CEE has dedicated resources to address this market.

Residential lighting consumption continues to be concern for CEE and its members. Many members have been promoting efficient lighting products for over 10 years. CEE developed a Lighting Initiative in 1994. Due to changing market conditions and dramatic changes in technology, CEE first revised the Initiative in 2000 and undertook the second revision in 2006.

CEE's first Residential and Small Commercial Lighting Initiative was approved in December 1994 with the primary focus on screw-based CFLs. In particular, Initiative participation was limited to providing a manufacturer buy-down to reduce the wholesale product cost. This was a cost-effective turn-key approach that was very effective in some service territories. However, the Initiative did not account for changing technologies, such as compact fluorescent fixtures, or address the complexity of the lighting market.

The existing Initiative, dating from 2000, provided a strategy to account for this complexity. Specifically, it focused on lighting fixtures for the first time and based its approach on a market characterization study that CEE commissioned in 2000. This characterization highlighted the need for a focused strategy given that the fixture market is highly complex with over 500 manufacturers and diverse retail channels.

2 Energy Savings Potential

Recent studies in all regions of the country have demonstrated that residential lighting, including both CFLs and fixtures, is a valuable source of energy savings. A selection of relevant studies demonstrating the potential savings is described below.

2.1 Northwest Electric Power and Conservation Plan, 2005

In a 2005 Northwest analysis, residential lighting was found to be the single largest contributor to achievable and cost-effective conservation potential. Lighting accounts for 41% of potential savings in homes, and if fully addressed could deliver 530 average MW to the region by 2025.

¹ Annual Energy Outlook 2006. Energy Information Administration. February 2006.

² Annual Energy Outlook 2006. Energy Information Administration. February 2006.

³ Lighting the Way to Energy Savings, Natural Resources Defense Council. December 1999.

⁴ http://www.eere.energy.gov/consumer/your_home/lighting_daylighting/index.cfm/mytopic=11980

2.2 California Statewide Residential Sector Energy Efficiency Potential Study, 2003

This study found that lighting was the best opportunity for energy savings in homes. It projected that lighting could deliver up to 4,867 GWh in achievable savings by 2012. In addition to energy savings, this study also addressed peak demand reduction and found that lighting represents the third-best opportunity for peak savings in homes. It could deliver up to 425 MW in achievable savings by 2012.

2.3 Economically Achievable Energy Efficiency Potential in New England, 2005

As in the other regions, this study found that residential lighting represents the greatest savings opportunity in homes, potentially delivering 49% of achievable energy efficiency by 2013. This adds to 6,245 GWh in energy savings in that time.

2.4 Illinois Residential Market Analysis, 2003

This market analysis found that residential lighting was one of the most beneficial measures for the statewide efficiency program to pursue. The annual savings potential from residential lighting added to over 125,000 MWh. Peak demand savings were projected at 69 MW annually for the state.

3 The Revised Residential Lighting Initiative

3.1 Overview

The CEE Residential Lighting Initiative addresses the entire energy-efficient residential lighting market, including both CFLs and energy-efficient fixtures. Due to the differences between residential and small commercial markets, the revised Initiative only addresses the residential market. A CEE initiative appropriate for the commercial market has been developed as a separate work effort.

The Initiative incorporates current market conditions and takes a strategic, focused approach to cost effectively influence the market towards more efficient lighting alternatives. Long-term objectives have been established, which are the basis for the recommended program approaches described below.

3.2 Overarching Initiative Objectives

The overarching goal of the Initiative is to capture the significant energy savings available through increased and sustained market share of efficient lighting products. The following are the specific long-term objectives for the energy-efficient lighting market. The specific goals for CFLs and fixtures, provided below, were developed to complement these overarching objectives.

- 1. Consumers understand and value the benefits of energy-efficient lighting products.*
- 2. Retailers promote and market energy-efficient lighting products.*

3. *Manufacturers produce, market, and promote energy-efficient lighting products.*
4. *Energy-efficient lighting products meet customer expectations in terms of quality and performance.*
5. *Energy-efficient lighting becomes a widespread option in new construction.*

3.3 Overarching Initiative Approach

The approach advocated by this Initiative is for participants to increase the relative emphasis on promotion of light fixtures as compared to promotion of CFLs, given that fixtures have been under-addressed to date. By encouraging programs to address both efficient technologies, the manufacturing and distribution players for both are more likely to respond consistently and favorably to our community's objectives.

3.4 Performance Specifications

ENERGY STAR is an information and branding campaign designed to facilitate consumers' identification and purchase of energy-efficient products. The U.S. Environmental Protection Agency (EPA) introduced the ENERGY STAR program in 1992 with computers, monitors and printers. In 1996, the U.S. Department of Energy (DOE) agreed to work jointly with EPA and introduced ENERGY STAR labels for home appliances. As of April 2006, the ENERGY STAR label covered over 40 consumer product categories⁵, and is planning to add several more in 2007.

The mission of the program is to achieve significant reductions in greenhouse gas emissions and energy consumption by permanently transforming markets toward energy-efficient products. The ultimate goal of ENERGY STAR is to have widespread brand recognition associated with the concepts of saving money on energy bills and protecting the environment.

ENERGY STAR performance specifications exist for both CFL and fixture products. The CEE Lighting Committee has been active in providing comments during revisions to the specifications to ensure that the qualified products deliver energy savings to the consumer while meeting expectations regarding light quality and output. The Initiative references the current ENERGY STAR specifications for both CFLs and fixtures. Resulting savings in both cases amount to approximately 66% versus traditional incandescent lighting.

3.5 Participation

To be considered an Initiative participant, the following are required:

1. Support the ENERGY STAR lighting program.
2. Incorporate the overarching Initiative approach (increase support for fixtures relative to CFLs) into the organization's lighting program design.

In addition, participants are encouraged to support individual product strategies as described below. In compiling its annual Lighting Program Summary, published each Fall, CEE will encourage participants to report specific program details for communication to key market players.

⁵ ENERGY STAR Products http://www.energystar.gov/index.cfm?fuseaction=find_a_product.

4 Compact Fluorescent Lamps

4.1 CFL Savings Potential

The average household includes 20 to 30⁶ light fixtures with an average of 45⁷ lamps/bulbs. About 86%⁸ of residential lighting energy is used by an incandescent light source. Assuming consumers replace the highest-consuming fixtures in a home, on average, a CFL can replace an incandescent source resulting in 66%⁹ less energy use per light source. Although it is not feasible to replace every incandescent source with a CFL due to certain conditions, even a fractional increase in CFL use will result in significant energy savings.

4.2 ENERGY STAR CFL Program

In 1999, CFLs were added to the list of ENERGY STAR qualified products. Currently, the technical specification addresses integrally-ballasted, screw-based CFLs. As of April 2006, 109 manufacturers and private labelers are participating with 1751 qualified products.

4.3 CFL Objectives

The Initiative's primary objective as related to CFLs is to ensure the consumer has a positive experience with an ENERGY STAR-qualified CFL. If a consumer has a positive experience (i.e. product meets their expectations), they are likely to make a repeat purchase and be more receptive to purchasing other ENERGY STAR products. Many consumers have had negative experiences with fluorescent lighting, particularly the first and second generation CFLs, or are simply unaware of the technology. Therefore it is critical to give consumers a positive experience to ensure the longevity of the efficient lighting market.

An additional objective is to leverage lighting industry resources to increase the number of consumers who understand and value the benefits associated with CFLs.

4.4 CFL Technical and Market Barriers

CFL technology has evolved considerably over the past two decades. Many of the technical barriers that prevented consumer acceptance have been removed such as size, flicker, electrical interference, and light output. The remaining barriers are more market and educational based including:

- Consumers lack understanding of product value due to long-term subsidies
- General dislike of fluorescent lighting
- Light color
- Product availability

⁶ Lighting the Way to Energy Savings, Natural Resources Defense Council. December 1999.

⁷ U.S. Lighting Market Characterization. Volume I: National Lighting Inventory and Energy Consumption Estimate. Navigant Consulting, Inc. September 2002.

⁸ U.S. Lighting Market Characterization. Volume I: National Lighting Inventory and Energy Consumption Estimate. Navigant Consulting, Inc. September 2002.

⁹ ENERGY STAR. Compact Fluorescent Light Bulbs. http://www.energystar.gov/index.cfm?c=cfls.pr_cfls

4.5 CFL Program Guidance

Initiative participants are encouraged to develop program approaches that specifically address the CFL market and technical barriers described above. In particular, they are encouraged to work cooperatively with CFL manufacturers and retailers to educate consumers on the lifetime benefits of CFLs, including both energy and non-energy effects.

5 Residential Light Fixtures

5.1 Fixture Savings Potential

While progress has been made in the screw-in CFL market, 86%¹⁰ of residential fixtures still contain incandescent bulbs. Residential light fixtures represent a sizeable opportunity for energy savings (approximately 66%¹¹ per fixture). According to EPA, ENERGY STAR-qualified residential lighting fixtures had achieved market penetration of only about 4 percent as of 2003.

According to a California study, an average of 26 fixtures using 2076 kWh per year were installed in single-family residences. Multi-family housing was slightly lower with 13 fixtures per household using 1084 kWh per year.¹²

5.2 ENERGY STAR Fixture Program

In 1997, ENERGY STAR developed an efficiency specification for fixtures. It is a technology-neutral specification divided into an indoor and outdoor category. Indoor fixtures are qualified based primarily upon the lamp performance; fixture efficiency is not addressed. Outdoor fixtures can qualify by either use of an efficient light source or by reduced operating time. Currently there are 49 participating manufacturers producing over 6,500 qualified models.

5.3 Fixture Objectives

CEE has worked with the Lighting Committee and a group of fixture manufacturers, lighting retailers, and industry representatives (under the auspices of the Fixture & Fan Working Group) to develop a common objective for the Initiative's focus on fixtures. This objective is to increase the following indicators of success:

- Number of manufacturers producing ENERGY STAR-qualified fixtures and ceiling fans
- Number of retailers selling ENERGY STAR-qualified fixtures and ceiling fans
- Number of shipments of ENERGY STAR-qualified fixtures and ceiling fans
- Customer awareness of ENERGY STAR-qualified fixtures and ceiling fans
- Growth of the ENERGY STAR-qualified fixtures and ceiling fans in new construction, including the growth of the ENERGY STAR Advanced Lighting Package

¹⁰ U.S. Lighting Market Characterization. Volume I: National Lighting Inventory and Energy Consumption Estimate. Navigant Consulting, Inc. September 2002.

¹¹ ENERGY STAR. Compact Fluorescent Light Bulbs. http://www.energystar.gov/index.cfm?c=cfls.pr_cfls

¹² Lighting Efficiency Technology Report. Volume I California Baseline. California Energy Commission. September 1999. Page 2.

5.4 Fixture Technical and Market Barriers

The fixture market faces many of the same barriers as the screw-based CFL market. However the level of consumer commitment is greater since the initial price is much higher and fixtures are often integral to a homes décor. Barriers to address include:

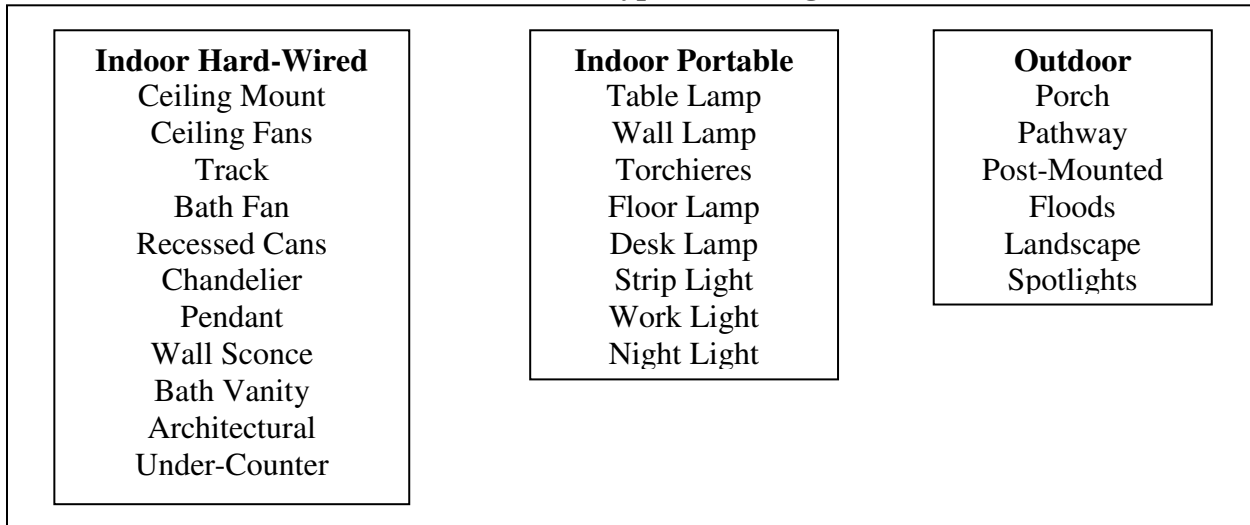
- Multiple pin configurations
- Lack of inexpensive dimming technologies
- Limited availability at retail outlets
- Higher incremental cost
- Few manufacturers producing products
- Few designs that emphasize CFL advantages
- “Consumers” of lighting not well educated about efficiency
- Little active marketing by salespeople
- Negative perception of fluorescent lighting
- Confusion about lamp type, configuration, length
- Description and selection of color
- Regional differences in fan use
- Different purchase process for ceiling fans
- Confusion caused by varying efficiency programs

5.5 Fixture Market Segmentation

In 2000, Opinion Dynamic Corporation completed research for CEE titled “Residential Lighting Fixture Market Assessment: Ceiling Fans and Outdoor Lighting.” The purpose of the research was to develop a better understanding the fixture market and identify promising market segments. This research was driven by the lack of available energy-efficient fixtures on the market and the need to develop strategies to have a greater impact.

The Market Assessment demonstrated that lighting fixtures can be divided into three main types: indoor hard-wired, indoor portable, and outdoor. These fixtures types can be further sub-divided as shown in Chart 1. Each sub-category has multiple style choices that change frequently and are heavily influenced by trends. The distribution channels also vary by product type (i.e. torchiere versus outdoor porch) and purchase opportunity (i.e. new construction versus remodel).

Chart 1: Fixture types and categories



The fixture manufacturing market is highly fragmented with hundreds of manufacturers and thousands of styles. The US Census Bureau identifies over 500 residential fixture manufacturers in the US.

Table 1 summarizes common residential fixture styles according to the basis of their design. The *style-based* category is characterized by a wide selection of models, with various housing designs, colors, and options. Product selections tend to be driven by fashion and decorating trends. The *functional* lighting categories have little model variation and are installed primarily to serve the purpose of illuminating a space. The *combination* lighting categories have some aesthetic appeal, but have little variation in style design or are installed primarily to serve a functional purpose.

Table 1: Basis of Fixture Design

| Style | Function | Combination |
|-------------------|--------------------|--------------------------|
| Table lamps | Recessed | Torchieres |
| Task/Desk lamps | Track lighting | Porch lighting |
| Floor lamps | Linear fluorescent | Outdoor post-mount |
| Wall sconces | Bathroom fans | Outdoor walkway |
| Suspended ceiling | Under-counter | Ceiling fans with lights |
| Attached ceiling | Outdoor floods | |

The design basis of fixtures is one way to approach market segmentation for fixtures, and was used as the primary segmentation tool in the 2000 Residential Lighting Fixture Market Assessment. Secondary factors that were considered in that research were hours of operation, sales potential, and appropriateness of CFL technology in a given fixture application. According

to that research, the most promising segments were recessed cans, torchieres, ceiling fans, and outdoor lighting, which all fall within the *function* or *combination* category.

One potential approach to increase fixture efficiency within the *style-based* category was identified in 2001, when CEE began talks with the American Lighting Association (ALA). ALA is a professional association representing decorative residential light fixture manufacturers, manufacturers' representatives, lighting designers, and lighting showrooms. ALA's constituency expressed an interest in working with CEE member efficiency programs to promote decorative, efficient fixtures. Based on this significant interest, CEE's focus with regard to fixture efficiency shifted to the fixture types and distribution channels related to the *style-based* category.

This shift was consistent with a long-term goal of the efficiency community: to have efficient lighting products available in all product types that consumers seek. This strategy places efficient products in head-to-head competition with less efficient alternatives. Due to the vast selection of fixture types and styles within the residential lighting fixture market, this approach is ambitious, and assumes there is support from manufacturers, retailers, and specifiers, as well as consumer awareness and demand for the products. CEE's work with ALA and DOE under the *Lighting for Tomorrow* banner is aimed at leveraging the support of ALA members to increase the number of manufacturers producing efficient, decorative fixtures, which is a necessary condition to achieving this long-term goal.

5.6 Fixture Program Guidance

Due to the complexity of the light fixture market, CEE worked throughout 2005 and 2006 to develop a resource to guide efficiency program efforts to promote fixtures and ceiling fans. This work was completed under that auspices of the CEE Fixture & Fan Working Group, which includes participation from CEE members, invited fixture manufacturers, lighting retailers, and other industry representatives. The recommendations developed by the group are captured in Appendix A: Program Guidance.

6 Emerging Technologies

CEE members have an interest in supporting emerging technologies that have the potential to deliver residential lighting energy savings in the future. One such promising technology is Light Emitting Diodes (LEDs), a type of Solid State Lighting (SSL).

CEE is pursuing several activities to support SSL as it develops. First, through the *Lighting for Tomorrow* program, CEE is working to encourage market introduction of fixtures using LEDs through a design charrette and competition in 2006. Second, CEE is monitoring test procedure development and technical advancements and reporting milestones to members. Finally, as SSL technology improves and it becomes more relevant to general illumination applications, CEE plans to engage Lighting Initiative participants to include SSL in the Initiative more fully. This process will include assessing the market and technology, establishing specific goals and objectives for this light source, and identifying program approaches to support it in the marketplace, as we have done with CFLs and fixtures.

Appendix A: Program Guide

Recommended Approaches for the Promotion of ENERGY STAR Light Fixtures and Ceiling Fans

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Background

The Consortium for Energy Efficiency's (CEE) Residential Lighting Initiative was first established in December 1994 to increase the production, distribution, purchase, and installation of high-efficiency, screw-based compact fluorescent lamps (CFLs) in the consumer market. It was revised in December 2000 to include a focus on functional, energy-efficient fixtures such as recessed cans, torchieres, ceiling fans, and outdoor lighting.

CEE's dual focus on CFLs and fixtures continues today, though the fixtures component was broadened to include decorative, energy-efficient fixtures in 2002. At this time, CEE began working with the American Lighting Association and the Department of Energy (represented by Pacific Northwest National Laboratory) on the Lighting for Tomorrow partnership. This work included a design competition for decorative, energy-efficient fixtures. The success of Lighting for Tomorrow began to demonstrate that working cooperatively with the lighting industry is an effective way to leverage resources and make inroads in a more strategic fashion.

As an outgrowth of its Lighting for Tomorrow work, CEE established the Fixture & Fan Working Group (FFWG) at the first annual CEE Industry Partner Meeting in September 2004. Up until this time, the complexity of the residential lighting market had hindered initial efficiency program efforts to promote ENERGY STAR® residential light fixtures. Against this backdrop, the FFWG was developed to determine whether and how the energy efficiency industry and the lighting industry could work together more effectively. The scope of the group was widened to include ENERGY STAR ceiling fans in early 2005.

Purpose

The purpose of this document is to provide a common starting point for efficiency program administrators to use when designing or modifying lighting fixture offerings. This should result in better-informed program designs that achieve their energy savings targets while supporting the development of the market for lighting fixtures and ceiling fans. It describes market actors, relevant barriers, and approaches to overcome them that have been developed with both efficiency industry and lighting industry expertise.

The document is a comprehensive source of information for efficiency program administrators to use, in conjunction with other resources, when they develop or modify programs focusing on ENERGY STAR light fixtures and ceiling fans. The Program Guidance document is also relevant for residential new construction program managers as they consider how to support more fully the growing market for ENERGY STAR light fixtures and ceiling fans in this channel. This document was developed by members of the FFWG Program Subgroup and vetted with the entire FFWG.

Fixture and Fan Program Considerations

Historically, efficiency program interest in residential light fixtures, as opposed to CFLs, has stemmed from the perception that fixtures are a non-regressive technology. In other words, once a fixture is installed in a consumer's home, the energy savings will last for as long as the fixture is in place. This is in contrast to a CFL, which may be removed by the customer if it does not meet expectations.

Over the past few years, this rationale for promotion of fixtures has started to change. While fixtures still have the benefit of longevity as an energy-saving measure, other considerations regarding fixture promotion have begun to drive program investment. To provide an example of this change in mindset, three of these considerations are outlined below.

Per-Unit Energy Saving Assumptions

Recent work by EPA to evaluate the fixtures on the ENERGY STAR Products List that meet Version 4.0 of the specification (which took effect on October 1, 2005) has demonstrated that the average ENERGY STAR-qualified fixture has two sockets. Though this research is not sales weighted, it has provided a basis for efficiency programs to consider weighing investment in fixtures and CFLs differently. Prior to this research, many efficiency programs assumed that a \$2 rebate on a screw-based CFL would yield the same kWh savings as a \$10 investment in a fixture. The EPA research changes the cost-effectiveness equation, and brings fixtures closer to CFLs in terms of cost-benefit (though CFLs are still widely accepted as the least expensive option to promote). The breakdown of fixtures by socket number is given below.

| Number of Sockets Per Fixture | Product Count | Percent of Products |
|--------------------------------------|----------------------|----------------------------|
| 1 | 3046 | 45% |
| 2 | 2523 | 37% |
| 3 | 453 | 7% |
| 4 | 451 | 7% |
| 5 | 78 | 1% |
| 6 | 72 | 1% |
| 7 | 70 | 1% |
| 8 | 72 | 1% |
| 9 | 5 | 0% |
| <i>Total</i> | <i>6770</i> | <i>100%</i> |

EPA is continuing to explore the question of savings assumptions for fixtures, and CEE will keep the FFWG informed of any new information as it arises.

Likelihood of Meeting Consumer Expectations

Because all ENERGY STAR-qualified fixtures and ceiling fan light kits are designed as systems (meaning the manufacturer should have considered the implications of pairing the light source and fixture), consumers have greater assurance that their expectations will be fully met. The implications to the consumer of incorrect application of CFLs range widely, and can include low lumen output, high levels of glare, poor color characteristics, and even early failure. Unlike screw-based CFLs, where the consumer is making application decisions, fixture application decisions are made at the manufacturer level. If the potential pitfalls of incorrect application are overcome in the fixture design process (as they should be), fixtures could provide a very attractive consumer alternative. As a result, the ENERGY STAR-qualified fixture would be more likely to meet the consumer’s expectations, which would logically lead to an increased purchase rate of ENERGY STAR lighting in the future.

Support for Leading Market Actors

Since the inception of the ENERGY STAR Residential Light Fixtures Program in 1997 and the start of the ENERGY STAR ceiling fan specification in 2001, leaders in the manufacturing and retail industries have contributed significantly to their growth. Efficiency programs have supported these leaders in the past and have begun to recognize that on-going support will not only positively reinforce these companies, but may also lead to a “domino effect,” or an increase in the number of manufacturers and retailers selling ENERGY STAR-qualified fixtures and ceiling fans. Conversely, there is growing realization among efficiency programs that if the early market actors do not see profitable returns from their initial investments, they could decrease their future involvement in the ENERGY STAR fixture and ceiling fan programs.

How to Use this Document

The Program Guidance document is divided by target audience into upstream and downstream sections. These target audiences are the key stakeholders that impact lighting decisions. Within the upstream section, the target audiences are manufacturers, retailers (big box retailers, showrooms, and electrical distributors), and builders/contractors. Consumers are addressed as the primary target audience within the downstream section.

As part of the discussion on each target audience, background information is provided that includes identification of the primary market and technical barriers to the audience’s increased adoption of ENERGY STAR-qualified fixtures and ceiling fans. A set of recommended program approaches (including background and rationale) for each audience is then provided.

To aid programs and acknowledge the inherent differences between new construction and retrofit channels, a graphic depicting whether each target audience is associated with the new construction market, retrofit market, or both is provided at the outset of each section. The “hammer” depicts an association with retrofit and the “home” depicts an association with new construction.

CEE will track use of this resource in its 2006 Lighting Program Summary, which is completed each Fall and summarizes the activities undertaken by members to promote efficient lighting.

Upstream Strategies



Manufacturers

The fixture manufacturing market is highly fragmented with hundreds of manufacturers and thousands of styles. In its 2002 Residential Electric Fixture Manufacturing Report, the U.S. Census Bureau identifies 473 residential fixture manufacturers in the U.S. This is in contrast to the light bulb manufacturing market, which is identified as having 56 companies in a corresponding 2002 U.S. Census bureau report.

Barriers

The primary barrier for manufacturers in deciding whether to increase their production of ENERGY STAR-qualified fixtures and fans is the lack of sustained, strong consumer demand for

these products. Underlying this market condition are limited showroom availability, the incremental price difference between incandescent and fluorescent technologies, and the lack of consumer awareness of the operational features and benefits associated with ENERGY STAR-qualified products.

| General Barriers Impacting Manufacturers | |
|---|--|
| | Multiple pin configurations |
| ✓ | Lack of inexpensive dimming technologies |
| ✓ | Limited availability at retail outlets |
| ✓ | Higher incremental cost |
| | Few manufacturers producing products |
| | Few designs that emphasize CFL advantages |
| ✓ | “Consumers” of lighting not well educated about efficiency |
| | Limited availability and high cost of replacement lamps |
| | Little active marketing by salespeople |
| ✓ | Negative perception of fluorescent lighting |
| | Confusion about lamp type, configuration, length |
| | Description and selection of color |
| | Regional differences in fan use |
| | Different purchase process for ceiling fans |
| ✓ | Confusion caused by varying efficiency programs |
| | Difficulty in replacing ballasts upon failure |
| | Inability to modify light output |
| | No tested standards for ballast lifetime |
| Barriers Specific to Manufacturers | |
| ✓ | Inconstant consumer demand |

Recommendations for Efficiency Programs

1. Develop a strong relationship with manufacturers’ local representatives.

- Taking into account manufacturer differences, establish relationships with the local manufacturer representative and/or with the manufacturer’s national-level ENERGY STAR contact.
- Use this relationship to inform manufacturers far in advance of upcoming program plans. Longer lead times can produce better results in leveraging manufacturer resources.
- Inform manufacturers of the entire program portfolio that could incorporate ENERGY STAR-qualified residential fixtures. These programs could include multifamily, new construction, small business, and low-income programs.
- Use ENERGY STAR Change a Light, Change the World campaign as an interaction point with manufacturers. Build on contacts generated during this campaign by seeking input from manufacturer partners about future program plans.

2. Create separate upstream incentives for manufacturers.

- This will help encourage more fixture manufacturers to respond to program outreach, including any RFPs or targeted cooperative marketing of ENERGY STAR-qualified fixtures and fans.
- Consider using these incentives to encourage manufacturers to develop full suites of ENERGY STAR-qualified fixtures and fans. These play an important role in the new construction market.

3. Offer incentives that reflect the actual savings delivered by each fixture type.

- When properly tracked, a tiered or variable incentive structure allows the efficiency program administrator to quantify more kWh savings by capturing all of the savings associated with each fixture instead of assuming that each fixture purchased has only one socket.
- This approach could be effectively applied under some program design scenarios more easily than others. For example, the administrative burden of this program design could be significantly lowered if the per-socket incentive were applied to instant rebates.
- This type of incentive structure “levels the playing field” for manufacturers, allowing them to receive the same incentive per socket as CFL manufacturers. Consumers also benefit by receiving a higher incentive, as it takes into account the large price range in the fixture market.
- There were two approaches identified during development of this document: per-socket incentives and tiered incentives based on a range of lumen output or watts.
 - A per-socket incentive structure provides greater incentive dollars for fixtures with more sockets. This is a relatively straightforward method of capturing additional savings. However, FFWG participants noted that this approach may create an incentive for manufacturers to design fixtures using multiple sockets instead of using other design solutions, such as circline lamps.
 - A tiered incentive structure, based on lumen output or watts, differentiates either two or three categories of fixtures and offers specific incentive levels for each. This approach has been used in California. In 2005, the statewide program administered by the investor-owned utilities offered one level of manufacturer incentive for fixtures less than 1100 lumens and another level for those over 1100 lumens. Also in 2005, SMUD identified 18W as the demarcation point in its upstream incentive program.

4. Offer year-round incentive programs.

- As stated above, one of the barriers manufacturers face when considering whether or not to increase production of ENERGY STAR-qualified fixtures and fans is inconstant demand. Similarly, manufacturers find it difficult to respond to promotions that have a short duration. These also may cause confusion to the sales representatives, retailers, and consumers.
- Efficiency program administrators and manufacturers should create annual incentives to allow all parties to prepare for and execute an incentive program in a more consistent manner. This will allow for the manufacturer and retailer to gear up inventory levels, educate sales personnel, and make ENERGY STAR a consistent, standing message, not one that is seen only two months out of the year.

- Note: Due to efficiency program resource constraints and planning timelines, if incentive programs cannot be implemented on a year-round basis, program changes should be communicated to manufacturers and other stakeholders as far in advance as possible.

5. Partner with manufacturers to reach other market actors.

- Manufacturers can assist efficiency programs to reach builders, showrooms, and distributors.
- One such approach that leverages manufacturer investment to reach builders and retailers is working with the manufacturer on a Model Home program. Key aspects of this program type are outlined below.
 - Partner with manufacturers to encourage a builder to display ENERGY STAR fixture and fan packages in a Model Home.
 - Partner with manufacturers to provide customized POP materials for each model home explaining the features, benefits (both environmental and financial), and sustained monthly energy savings being realized with the purchase of the ENERGY STAR lighting package.
 - Partner with manufacturers to provide ENERGY STAR training to local realtors, builder salespeople, and design center personnel. The objective is to educate these groups on the benefits of ENERGY STAR lighting so that they can “sell” the concept to home buyers. Provide an award of some small value for completion of the training seminar.
 - Partner with manufacturers to provide builder and/or consumer incentives for the purchase of the ENERGY STAR lighting package.

6. Support product development and demonstration efforts.

- CEE’s work with the American Lighting Association (ALA) and the Department of Energy (represented by Pacific Northwest National Laboratory, PNNL) under the Lighting for Tomorrow umbrella is intended to introduce more decorative ENERGY STAR-qualified fixture styles that lighting showrooms would be likely to carry. Efficiency program sponsorship of this effort can be leveraged locally—it provides an important talking point for programs to use in initial discussions with manufacturers.
- PNNL has been working for some number of years to develop IC-rated airtight recessed cans for the new construction and renovation markets. There still may be opportunities to participate in the effort to more fully commercialize these products.

7. Support the emerging GU-24 “Twist and Lock” lamp-socket technology.

- Work with manufacturers and EPA to support the development of a new technology that directly addresses issues of ballast replacement and pin base configuration. The technology consists of a self-ballasted lamp that connects to the fixture at the line voltage socket. The socket itself uses a GU-24, or “twist and lock,” base type. Fixtures would no longer require one or more hard-wired ballasts, as the ballast would be part of the lamp. Additionally, manufacturers could potentially convert much of their incandescent product line to ENERGY STAR qualified with the simple use of the GU-24 socket.
- In order to be successful in the market, the new self-ballasted lamps that fit into the “twist and lock” sockets must meet consumer expectations in terms of light output, efficiency,

and quality. Working through the CEE Lighting Committee, efficiency programs can argue for their inclusion in either the existing DOE-administered ENERGY STAR CFL program or in a similar EPA-administered program for self-ballasted CFLs with the GU-24 base.

Midstream Strategies

Retailers



Big Box Retailers

This category includes Do-It-Yourself (DIY) national chains such as The Home Depot and Lowe’s, as well as mass merchants such as Target and Wal-Mart. Though these stores may have some interaction with the new construction market, they play a very large role in the retrofit market. DIY retailers are very active in ENERGY STAR; mass merchants are emerging, though their vendors drive most of the activity.

Barriers

| General Barriers Impacting Big Box Retailers | |
|---|--|
| ✓ | Multiple pin configurations |
| ✓ | Lack of inexpensive dimming technologies |
| ✓ | Limited availability at retail outlets |
| ✓ | Higher incremental cost |
| ✓ | Few manufacturers producing products |
| ✓ | Few designs that emphasize CFL advantages |
| ✓ | “Consumers” of lighting not well educated about efficiency |
| ✓ | Limited availability and high cost of replacement lamps |
| ✓ | Little active marketing by salespeople |
| ✓ | Negative perception of fluorescent lighting |
| ✓ | Confusion about lamp type, configuration, length |
| ✓ | Description and selection of color |
| ✓ | Regional differences in fan use |
| ✓ | Different purchase process for ceiling fans |
| ✓ | Confusion caused by varying efficiency programs |
| | Difficulty in replacing ballasts upon failure |
| | Inability to modify light output |
| | No tested standards for ballast lifetime |
| Barriers Specific to Big Box Retailers | |
| ✓ | Sales staff are not educated about efficiency |
| ✓ | Hard to access the decision-maker for the chain |
| ✓ | Inconsistent implementation across all stores |

Recommendations for Efficiency Programs

1. Ensure that families of ENERGY STAR products are in stock and on display.

- Educate the buyer for the Big Box store. The buyer is a key decision maker who determines whether ENERGY STAR products will be stocked and displayed at the big box store, and if so, which fixtures these will be. An educated buyer can be an important ally of efficiency programs. As such, programs should work with manufacturers (who often have existing relationships with these individuals) to educate buyers on the benefits associated with ENERGY STAR-qualified fixtures and ceiling fans.
- Use the ENERGY STAR Change a Light, Change the World campaign as an interaction point with national Big Box retailers.
- Use stocking incentives when necessary, keeping in mind the long lead times that this market actor requires.

2. Use POP displays to draw attention to the fixtures and fans and to educate customers.

- One important part of a year-round, retail-based fixture program is a compelling point of purchase (POP) display. Develop in-store signage and educational materials in conjunction with the Big Box retailer with messaging and graphics that are modified seasonally.
 - Note: Some ongoing maintenance of these materials is necessary to ensure that they are properly displayed. If this maintenance is not possible, consider using this recommendation for very short-term promotions only.

3. Design customer incentives to capture savings, simply.

- Consider designing incentives to capture savings of fixtures with multiple light sources (sockets) such as vanity lights, chandeliers, ceiling fan light kits, etc.
- Consider streamlining incentive paperwork, keeping in mind that with Big Box stores, the more complicated the promotion, the less likely it is that they will participate.

4. Educate Big Box retailer sales staff with quick-reference tools.

- Due to high rates of staff turnover and the fact that staff at Big Box retailers are likely to be home improvement generalists rather than lighting specialists, programs should provide quick-reference training materials for sales associates to refer to when faced with customer questions.
- Consider using incentives targeted at sales staff for the sale of ENERGY STAR products.

Showrooms

Lighting showrooms are retail outlets that specialize in lighting products and sometimes home accessories. Showrooms may also offer design and layout assistance to homebuyers and builders and play a significant role in consumer education.

Showrooms play a large role in the new construction market. Most often the customer is the end-user, such as the homebuyer, though there are showrooms that focus on the builder or designer



and do not advertise to the general public. This section of the Program Guidance document focuses on the showrooms that interact with the consumer.

In cases where the customer is a new home buyer, the homeowner identifies and selects light fixtures and ceiling fans for a custom-built home. In some cases, builders may recommend or require that the homebuyer select lighting products at pre-designated stores/locations. Consumers often work within a pre-established cost allowance (lighting budget) and select products for the various locations throughout the house that will be installed by the builder. Under this arrangement the showroom staff will focus on “up-selling” the home owner in order to increase sales and profits. Approximately 30% of consumers will purchase lighting as allotted, while 70% will purchase above their allotted budget.

Production builders may purchase through showrooms or Big Box retail outlets, or they may work with showrooms to have pre-selected products available for viewing and selection at the builder’s design center. The homeowner can then view products and make selections. Under this arrangement, as in the previous example, the showroom staff will focus on “up-selling” the home owner in order to increase sales and profits.

Showrooms also play a role in the renovation and retrofit market. When homeowners are remodeling, updating home environments, or making home additions, they are likely to purchase products at either lighting showrooms or at Big Box retailers. Customers who are seeking to furnish more elaborate homes or find unique fixtures are more likely to shop at a lighting showroom rather than a Big Box retailer due to the larger selection offered at showrooms (either on display or through catalogs).

Barriers

| General Barriers Impacting Lighting Showrooms | |
|--|--|
| | Multiple pin configurations |
| ✓ | Lack of inexpensive dimming technologies |
| | Limited availability at retail outlets |
| ✓ | Higher incremental cost |
| ✓ | Few manufacturers producing products |
| ✓ | Few designs that emphasize CFL advantages |
| ✓ | “Consumers” of lighting not well educated about efficiency |
| | Limited availability and high cost of replacement lamps |
| ✓ | Little active marketing by salespeople |
| ✓ | Negative perception of fluorescent lighting |
| ✓ | Confusion about lamp type, configuration, length |
| ✓ | Description and selection of color |
| ✓ | Regional differences in fan use |
| ✓ | Different purchase process for ceiling fans |
| | Confusion caused by varying efficiency programs |
| | Difficulty in replacing ballasts upon failure |
| | Inability to modify light output |

| | |
|--|--|
| | No tested standards for ballast lifetime |
| Barriers Specific to Lighting Showrooms | |
| ✓ | Risks of stocking products without consumer demand |
| ✓ | High turnover of sales associates |

Recommendations for Efficiency Programs

1. *Concentrate outreach on likely program participants.*

- Target showroom outreach to retailers that have signed the ENERGY STAR partnership agreement. Based on their stated interest in ENERGY STAR, these retailers are predisposed to participate in efficiency programs. Use the ENERGY STAR web site to locate them, or contact CEE for a list. ENERGY STAR partner members of the American Lighting Association and Lighting One are listed at www.energystar.gov/index.cfm?fuseaction=store.store_locator.
- Concentrate efforts on showrooms and distributors with “builder” salespeople.
- Use the ENERGY STAR showroom case studies to demonstrate the business case for carrying and promoting ENERGY STAR-qualified fixtures and fans. This information will provide a context for the sales and technology training that can follow. The case studies are available online at www.energystar.gov/index.cfm?c=fixtures.pr_showroom_casestudies.

2. *Ensure that ENERGY STAR-qualified products are in stock and on display.*

- Less than 20% of a given showroom’s sales are likely to be by special order, thus it is important to have ENERGY STAR-qualified fixtures and fans in stock and on display. This is because showrooms carry a large inventory and therefore don’t want to special-order fixtures through catalogs. They need to sell fixtures that are in stock.
- Assist showrooms to ensure they have adequate stock for special promotions or during peak buying seasons.
- Use stocking incentives when necessary, keeping in mind simplicity of program design will make it easier for showrooms to participate.
- Give the showroom guidance on setting up in-store displays. Encourage showrooms to integrate ENERGY STAR products with their other product offerings. A key element of the successful ENERGY STAR showrooms, as demonstrated through case studies, is to integrate the products, not separate them.

3. *Focus on educating showroom sales staff.*

- Sustained and updated sales training is key. Assist showrooms to develop marketing and sales strategies that reach their customers. Training should take into account the various drivers of each customer group (builders, electricians, and homeowners).
- Emphasize quality aspects of ENERGY STAR-qualified lighting within the sales training to dispel myths about fluorescent technology. Also include information on energy and non-energy benefits.
- Provide incentives to personnel for taking ALA or NAED ENERGY STAR training.

- Showrooms are most receptive to training that is offered by their own industry, thus partnering with an industry group (e.g. American Lighting Association) or a manufacturer to approach showrooms with training opportunities is best.
- In order to be successful, training needs to be targeted and offered to the right individual within the organization. Efficiency programs that offer training should invite employees, not just managers.

4. Use POP displays to draw attention to the fixtures and fans and to educate customers.

- One important part of a year-round, retail-based fixture program is a compelling point of purchase (POP) display. Develop in-store signage and educational materials in conjunction with the showroom with messaging and graphics that are modified seasonally. Hangtags have been particularly successful with efficiency programs to date.
 - Note: Some ongoing maintenance of these materials is necessary to ensure that they are properly displayed. If this maintenance is not possible, consider using this recommendation for very short-term promotions only.

5. Design incentives to capture savings without burdening the showroom.

- Consider designing incentives to capture savings of fixtures with multiple light sources (sockets) such as vanity lights, chandeliers, ceiling fan light kits, etc.
- Consider streamlining incentive paperwork, keeping in mind that with showrooms, the more complicated the promotion, the less likely it is that they will participate.
- Efficiency program administrators in California should consider leveraging the Title 24 building codes by working with showrooms to promote builder compliance with the codes through use of ENERGY STAR-qualified fixtures.

6. Use a salesperson incentive (SPIFF) to increase sales of ENERGY STAR-qualified fixtures and fans.

- Lighting showrooms are familiar with SPIFF programs, as these are often offered by manufacturers to increase sales of new product introductions.
- Manufacturer experience shows that SPIFF programs aimed at staff, not the showroom owner, are most successful at driving sales. Simplicity is also key to a successful SPIFF program.

7. Encourage showrooms to install screw-based CFLs in their traditional fixture types.

- Several lighting showrooms have switched the lamps in their traditional fixtures to screw-based CFLs. The advantages to the showroom include energy savings and cooler operating temperatures. This allows showroom staff and customers to become familiar with the technology.
- If pursuing this approach, programs should ensure that the showroom owners and sales staff are familiar with the advantages that dedicated fixtures offer above and beyond screw-based CFLs. These include a longer lamp operating life (10,000 hours minimum per the ENERGY STAR specification) and improved light output because the fixture and light source have been designed as one system.



Distributors

There are many different business models used in the electrical distributor business, and each needs to be understood by the efficiency program administrator seeking to impact this group. Distributor types include electrical distributors with and without builder showrooms, small independently-owned stores, and regional and national chain stores.

One thing that ties all of these business types together is that the vast majority (98%) sell lighting, according to a recent study by the National Association of Electrical Distributors (NAED). According to this same survey, approximately 75% of these distributors expected lighting sales to increase in importance over time. Typically, according to Electrical Wholesale Magazine, the commercial light fixtures represent 9% of a store’s sales, while residential lighting only represents 3.9%.

Distributors are important because they, along with lighting showrooms, supply a large percentage of the new construction market. They often have strong ties with builders, and can therefore be an important entry point for programs to reach builders. Though residential lighting only represents a small percentage of distributor activity, it adds to approximately \$3.5 billion dollars of annual residential lighting fixture sales nationally.

Barriers

| General Barriers Impacting Distributors | |
|--|---|
| | Multiple pin configurations |
| ✓ | Lack of inexpensive dimming technologies |
| | Limited availability at retail outlets |
| ✓ | Higher incremental cost |
| ✓ | Few manufacturers producing products |
| ✓ | Few designs that emphasize CFL advantages |
| ✓ | “Consumers” of lighting not well educated about efficiency |
| | Limited availability and high cost of replacement lamps |
| | Little active marketing by salespeople |
| ✓ | Negative perception of fluorescent lighting |
| ✓ | Confusion about lamp type, configuration, length |
| ✓ | Description and selection of color |
| ✓ | Regional differences in fan use |
| ✓ | Different purchase process for ceiling fans |
| | Confusion caused by varying efficiency programs |
| | Difficulty in replacing ballasts upon failure |
| | Inability to modify light output |
| | No tested standards for ballast lifetime |
| Barriers Specific to Distributors | |
| ✓ | Residential lighting is a small percentage of total sales, making it a low priority |
| ✓ | Diversity of distributor types makes program design difficult |

Recommendations for Efficiency Programs

To work successfully with electrical distributors, programs should seek to create the following conditions. First, the distributor must have a large selection and stock from which the builders can choose their fixtures. Second, these fixtures must be displayed in order to demonstrate the product to end-users and builders. Third, the distributor must train knowledgeable salespeople to explain the benefits associated with the products. An efficiency program can help to create these conditions by offering a complete program to the distributor, elements of which are described below.

1. Concentrate outreach on likely program participants.

- In 2005, ENERGY STAR formed partnerships with the National Association of Electrical Distributors (NAED) and the National Association of Independent Lighting Distributors (NAILD).
- Ninety members of these organizations have since signed on to the ENERGY STAR program, representing over 400 storefronts. A list of these distributors is available online at www.energystar.gov/index.cfm?c=pt_reps_lighting_upgrade.partners or through CEE.

2. Create a relationship with the staff responsible for the sale of residential light fixtures.

- Because residential lighting represents a small part of a distributor's sales, it is important that outreach is directed at the correct individuals. Programs should target the distributor's lighting showroom manager, who sells to the homeowner, and the distributor's salesperson responsible for builder accounts.
- Once the correct staff are identified, a strong working relationship needs to be developed. In initial discussions, it is important to stress that ENERGY STAR lighting is a quality alternative that allows for up-selling, which will increase sales and profits.

3. Work with the distributor and manufacturer to create packages of ENERGY STAR-qualified lighting from which the builder can select.

- Due to the fact that builders seek a multitude of products from their preferred electrical distributor, simplicity of choice in lighting is critical. By working with the local manufacturer's representative and the distributor to develop ENERGY STAR packages, the builder's choice is maintained. If incentive dollars are contributed from both the efficiency program and the manufacturer, the cost of the package to the builder can be kept competitive with standard packages.

4. Offer the distributor assistance creating special cooperative promotions and advertising to drive sales.

- Hang tags that identify ENERGY STAR-qualified products are one way to draw attention to these fixtures and fans.
 - Note: Due to the typically small size of distributor showrooms, it may not be feasible to use hang tags. Other approaches to identify ENERGY STAR-qualified products may be necessary.

5. Offer incentives where appropriate.

- Due to the distributor’s focus on the new construction market and the builder’s focus on the first cost, incentives play an important role when working with this retail channel. Efficiency programs have noted that a buy-down approach is a good candidate for engaging this market actor.
- Incentives should be paired with education to both the distributor and his/her customer, so that they both learn to recognize the inherent value in ENERGY STAR-qualified fixtures and fans to their businesses and to the end consumer.



Builders & Contractors

Builders and contractors are in a unique position to influence fixture installations in the home as they have the ability to oversee, and, if desired, specify or directly install the fixtures and fans to be used in the newly-constructed home. For production builders, they, along with their electricians, are solely responsible for lighting fixture selection. Though few custom builders have expressed interest in ENERGY STAR-qualified fixtures and fans to date, their involvement in all details of a construction project means that they are responsible for having lighting installed by their subcontracted electrician. Their position of authority with the homeowner also provides them with great influence to steer the homeowner toward choosing ENERGY STAR-qualified fixtures and fans.

Barriers

The primary barriers for builders and contractors – like homeowners – are product availability, confusion with lighting color, multiple pin configurations, and concerns about the availability of replacement lamps. Additionally, all of the barriers noted below present obstacles, hassles, and inconveniences for builders/contractors trying to source ENERGY STAR-qualified fixtures and fans. For these reasons, this sector may be more inclined to go with the “tried and true” or “no hassle” technology in an incandescent fixture.

| General Barriers Impacting Builders | |
|--|--|
| ✓ | Multiple pin configurations |
| ✓ | Lack of inexpensive dimming technologies |
| ✓ | Limited availability at retail outlets |
| ✓ | Higher incremental cost |
| ✓ | Few manufacturers producing products |
| ✓ | Few designs that emphasize CFL advantages |
| ✓ | Limited availability and high cost of replacement lamps |
| ✓ | “Consumers” of lighting not well educated about efficiency |
| ✓ | Little active marketing by salespeople |
| ✓ | Negative perception of fluorescent lighting |
| ✓ | Confusion about lamp type, configuration, length |
| ✓ | Description and selection of color |
| ✓ | Regional differences in fan use |
| ✓ | Different purchase process for ceiling fans |

| | |
|--------------------------------------|---|
| ✓ | Confusion caused by varying efficiency programs |
| ✓ | Difficulty in replacing ballasts upon failure |
| ✓ | Inability to modify light output |
| ✓ | No tested standards for ballast lifetime |
| Barriers Specific to Builders | |
| ✓ | Reluctance to bring an additional decision to the homeowner that could complicate process |
| ✓ | Diversity of distributor types makes program design difficult |
| ✓ | Small number of families of ENERGY STAR-qualified fixtures and fans |

While these barriers are significant, they are not overwhelming. Little by little as the market for ENERGY STAR-qualified fixtures and fans matures, product availability, quality, and aesthetic design and performance will improve.

Recommendations for Efficiency Programs

The following recommendations are intended to assist programs in increasing the unit count of ENERGY STAR-qualified fixtures and fans installed per home in a given efficiency program's service territory or region. Specifically, they are targeted to achieve a number of smaller, intermediate goals. These include a) increased product selection and availability at local lighting showrooms, wholesale suppliers, and building supply stores; b) improved product quality, c) dimming capability at a competitive price, d) increased efficiency program investments in rebates and product marketing, and e) increased homeowner awareness and demand.

1. *Concentrate outreach on likely program participants.*

- Determine which builders in your area participate in a local ENERGY STAR Homes or other "green" building program. A list of ENERGY STAR builders is available online at www.energystar.gov/index.cfm?fuseaction=new_homes_partners.showHomesSearch.
- Information about local green building programs, including a listing of programs by area, is available from the National Association of Home Builders (NAHB) at www.nahbrc.org/green3.asp?CategoryID=1801. Green builders are an important group to target, given that efficient lighting fits well within their value proposition to customers. Based on anecdotal information, it appears that many green builders are not yet installing efficient fixtures, and therefore a large untapped opportunity remains.
- Determine whether your local homebuilding association has an interest in energy efficiency. NAHB also maintains a list of local builders' associations, which is available at www.nahb.org/local_association_search_form.aspx#.

2. *Educate builders and contractors, and through them, the homeowner.*

- Conduct outreach at local homebuilders' shows. In addition, partnerships with local homebuilders and re-modelers associations can serve as a good educational venue for efficiency program staff.
- Write and pitch press releases to local newspapers as well as homebuilding and remodeling magazines to spark builder interest.
- Include ENERGY STAR lighting design and POP information as a standard insert in program materials distributed to builders and contractors. For example, Efficiency Vermont's Lighting Guide is a useful educational resource. It is available at

http://www.encyvermont.com/Docs/EV_LightingGuide6.18.03.pdf. Another example is the Northeast Energy Efficiency Partnership's Lighting Catalog, which profiles a range of models and manufacturers, while providing inserts on the locations of participating showrooms that stock efficient fixtures. This is available at <http://estarlights.com>.

- Create and distribute a brief summary sheet explaining the benefits of ENERGY STAR-qualified fixtures and fans that the builder can give to the homeowner. This could include dollar savings, reduced greenhouse gas emissions, benefits of less frequent lamp changes, etc.

3. Offer incentives where appropriate.

- Partner with other programs (new construction, existing home retrofit, multifamily, weatherization) to promote ENERGY STAR-qualified fixtures and fans that are installed in high-use locations. A small percentage of lighting locations are responsible for the majority of the lighting load, as such, programs should consider targeting and designing an incentive program for these high-use locations.
- If your organization runs a residential ENERGY STAR Homes Program, work with your colleagues to promote ENERGY STAR-qualified fixtures and fans, as well as the ENERGY STAR Advanced Lighting Package, through that program.

4. Help builders and contractors identify decorative ENERGY STAR fixtures and fans.

- Team with local lighting retailers and distributors to create a custom ENERGY STAR fixture list. This list should include a variety of ENERGY STAR-qualified fixtures and fans at different price points and styles that have been found, in the opinion of the lighting experts, to be a good quality product at a reasonable price. The list should include the full range of most commonly installed fixture types (recessed cans, chandeliers, wall sconces, bath bars, exterior, etc.).
- Promote the Lighting for Tomorrow winners to builder audiences. This promotion could include distribution of the Lighting for Tomorrow 2005 catalog of winning products, placement of hang tags in retail outlets that stock the fixtures, and demonstration of winners at builder shows or efficiency training events.

5. Create a Model Home Program.

- Support the showcasing of ENERGY STAR-qualified fixtures and fans in model homes. These are an excellent opportunity to capture the attention of possible homebuyers and builders who see the products in the home. For more information on key aspects of this program approach, see the Manufacturer section above.

6. Reinforce builder participation in your programs.

- Present annual awards (with media exposure) to the builder/contractor that installs the highest average number of ENERGY STAR-qualified fixtures and fans per home.
- Once you have initial program success stories, develop case studies that highlight the business success of including ENERGY STAR lighting in new homes and then actively distribute these to non-participating builders.

- In addition to success stories from your own area, distribute the EPA case studies about ENERGY STAR lighting in new homes. These are located online at http://www.energystar.gov/index.cfm?c=fixtures.alp_consumers.

Downstream Strategies



Consumers

While upstream market strategies to expand product lines and increase the stocking, specification, and sale of ENERGY STAR fans and fixtures are all critical program activities, it is equally important that consumers make a conscious decision to choose ENERGY STAR lighting products rather than conventional incandescent or halogen fixtures. These fixtures and ceiling fans are nearly always more expensive (from a first cost perspective) than conventional lighting products and incorporate a light source, fluorescent, that represents a potential aesthetic barrier for many consumers.

Active residential lighting program efforts in the Northeast, Northwest, Midwest, and California provide useful and relevant experience, information and direction to new program administrator efforts to influence consumer decision-making in this market. Traditionally, these efforts have included a variety of program components, including consumer education and financial incentives. Note, however, that the actual consumer role in the decision making for a given lighting product may vary by type of product and by the type of event (whether new purchase, replacement of an existing fixture, etc.).

For portable fixtures, consumers are the principal decision makers regarding product choice. For hard-wired fixtures, including ceiling fans, the associated replacement/construction activity often defines the relative level of consumer involvement in product selection. As noted above, in new construction and major retrofit projects, the builder or contractor can play a major role in deciding the type of fixture installed, or the retailer from which the product is purchased. For replacement purchases, or smaller homeowner Do-It-Yourself projects, the consumer is typically the principal, if not sole, decision maker.

The recommendations below are meant to address a number of consumer related barriers, most notably product awareness, understanding of product benefits, product availability, and the higher retail price associated with ENERGY STAR-qualified fixtures and ceiling fans. Depending on program objectives, program resources, and the existing local/regional market for ENERGY STAR-qualified fixtures and ceiling fans, some or all of the proposed strategies may be appropriate.

Barriers

The barriers that a consumer encounters in selecting an ENERGY STAR fixture are varied and include awareness, availability, aesthetic and cost considerations. Each of these is outlined below.

Research by CEE and others continues to show a growing awareness and understanding of the ENERGY STAR label, and these awareness levels are highest in those parts of the country that

actively promote ENERGY STAR products. Nonetheless, many consumers remain unfamiliar with ENERGY STAR-qualified fixtures and ceiling fans. Further, many consumers do not fully understand the energy savings and replacement lamp savings associated with these products; they do not view a fixture purchase from the perspective of total lifetime ownership and operating costs. From this perspective, ENERGY STAR-qualified fixtures and fans are almost always the lower cost alternative.

ENERGY STAR ceiling fans and fixtures are typically more expensive to purchase than their incandescent and halogen counterparts, reflecting the higher costs for electronic ballasts and compact fluorescent lamps. While low-cost ENERGY STAR-qualified fixtures and fans are available; e.g., exterior jelly jars and some flush mounted ceiling fixtures, these products may have limited consumer appeal. As noted above, the higher costs for ENERGY STAR-qualified fixtures and fans are almost always more than offset by lower operation and maintenance (lamp replacement) costs.

Due to the higher costs and smaller market for ENERGY STAR-qualified fixtures and fans, many manufacturers have been reluctant to produce extensive lines of ENERGY STAR-qualified products and retailers have been equally reluctant to stock them. Lighting showrooms have also noted a dearth of higher-end ENERGY STAR-qualified lighting.

In addition to the limited types and styles of fixtures currently available as ENERGY STAR, many consumers are hesitant to use fluorescent lighting in their living and entertainment areas - dining rooms, living rooms, dens, and bedrooms. Consumers perceive fluorescent lighting as inferior – too cool, too white, or too blue – to “warmer” incandescent lighting.

While CFLs are increasingly available in regular retail channels, the availability of pin-based lamps for fixtures is considerably more limited. Further, the number of different pin-based configurations further increases the challenge that consumers face in finding replacement lamps.

| General Barriers Impacting Consumers | |
|---|--|
| ✓ | Multiple pin configurations |
| ✓ | Lack of inexpensive dimming technologies |
| ✓ | Limited availability at retail outlets |
| ✓ | Higher incremental cost |
| ✓ | Few manufacturers producing products |
| ✓ | Few designs that emphasize CFL advantages |
| ✓ | Limited availability and high cost of replacement lamps |
| ✓ | “Consumers” of lighting not well educated about efficiency |
| ✓ | Little active marketing by salespeople |
| ✓ | Negative perception of fluorescent lighting |
| ✓ | Confusion about lamp type, configuration, length |
| ✓ | Description and selection of color |
| ✓ | Regional differences in fan use |
| ✓ | Different purchase process for ceiling fans |

| | |
|---------------------------------------|---|
| | Confusion caused by varying efficiency programs |
| ✓ | Difficulty in replacing ballasts upon failure |
| ✓ | Inability to modify light output |
| ✓ | No tested standards for ballast lifetime |
| Barriers Specific to Consumers | |
| | No additional barriers |

Recommendations for Efficiency Programs

The following recommended program strategies can be pursued individually or in combination, though synergies typically exist through the pursuit of multiple program strategies.

1. *Leverage national marketing and promotional efforts by ENERGY STAR.*

- National-level marketing that focuses on the existence of ENERGY STAR-qualified fixtures and fans, their benefits, and their availability for purchase is seen as one of the necessary conditions for the growth of the market for these products. Currently, the Change a Light, Change the World campaign administered by EPA is one vehicle that programs can leverage.
- In order to add new elements to year-round lighting programs, take advantage of both the promotional materials and the “buzz” that ENERGY STAR creates each fall with their Change a Light, Change the World campaign. Many retailers and manufacturers now plan their lighting promotional activities to coincide with this national campaign.

2. *Develop and implement joint promotions with industry.*

- Consider developing wholesale buy-downs and retailer markdowns, which have been shown to be successful strategies to leverage industry financial support and to reduce product price to consumers, without the administrative burden of processing coupons. These promotions are typically solicited through a competitive request for proposal process (RFP).
 - The wholesale or retail incentive may be stated in the RFP or may be a competitive component of the industry proposal. As part of this process, manufacturers and retailers are expected to describe how they would contribute to the incentive in their proposals. Retailers are also typically required to provide regular and timely sales data to receive any incentive payments.
 - This has proven to be a challenge even for some larger regional and national chains. In addition to product price support, the RFP may also request support of complementary marketing activities. Program administrators pursuing this option may want to consider keeping fixture/fan RFPs separate from CFL RFPs.
- Establish a standing cooperative advertising program that provides a percentage of development and/or placement costs for pre-approved advertising efforts. Caps can be established per ad, and/or per industry partner for the year. Caps might also vary by media type and by the geographic coverage and duration of the proposed advertising effort.

3. *Develop and implement a comprehensive consumer education campaign.*

- Provide your internal marketing department with information on ENERGY STAR-qualified fixtures and fans for company-wide communications and to build employee interest and adoption of ENERGY STAR products.
- Create bill inserts on the energy benefits and non-energy benefits of installing ENERGY STAR-qualified fixtures and fans.
- Make sure to consider these main points in your educational materials:
 - Explain that there are a variety of fixture styles for all rooms of the house, from decorative to utilitarian.
 - Focus on basic education to avoid confusion caused by advanced technical information.
 - Focus on consumer benefits, including energy savings, lower heat, long life, durability, better light quality, and decorative options.
 - Spend time explaining color, which may have negative connotations for some consumers. Explain that technical advances that have allowed CFLs to deliver high-quality color that is indistinguishable from incandescent.
- Include articles on ENERGY STAR-qualified fixtures and fans in customer newsletters.
- Include ENERGY STAR messaging on your organization’s web site, describing the environmental and economic savings of replacing existing lighting with efficient lighting.
- Consider educating consumers on appropriate applications for ENERGY STAR fixtures given the limitations and advantages of the technology. CEE is considering developing an Application Guide to guide efficiency program work in this area. Contact CEE for more information on the status of this resource.

4. Offer incentives when appropriate.

- Consider “instant rebates” as one way to provide at-the-cash-register discounts for consumers buying ENERGY STAR-qualified fixtures and fans. Discounts can be the same or similar for all ENERGY STAR-qualified fixtures and fans, or can vary as discussed in the Manufacturer section above. This latter approach may provide additional incentive for consumers to buy mid- and higher-priced ENERGY STAR-qualified fixtures and fans. Typically, the rebate coupons are sent to a program contractor for processing and redemption.
 - Note: As the retailers must submit the coupons for processing and reimbursement, some smaller retailers have declined to participate in these program activities.
- Consider running a torchiere turn-in promotion, which have been a highly visible promotional activity to replace consumers’ halogen or incandescent torchieres with ENERGY STAR-qualified models. These promotions often focus as much on safety issues (somewhat mitigated by revised torchiere construction) as on energy savings. ENERGY STAR torchieres are typically provided at low or not cost to consumers turning in their conventional torchieres, which are then scrapped. These promotions are often done at the site of a retailer that provides some combination of space, staff and products.

Conclusions

At its core, successful efficiency program promotion of ENERGY STAR-qualified fixtures and ceiling fans depends on the delicate art of balancing upstream activity to build supply and downstream activity to build demand. It also depends on extensive knowledge of the players and

channels that are relevant to residential lighting, strong relationships with the key market actors, and a consistent, sustained program presence.

The information in this document provides a starting point for efficiency program managers and is based on the experience and input of several lighting program managers and the EPA ENERGY STAR Program. Program managers are encouraged to consider how these recommendations could best be implemented to meet individual program goals.

The most important recommendation in this document is that efficiency program managers identify the manufacturers, retailers, and builders that will be important to their program success locally and open a dialogue with them at the initial stage of program development. Invested, engaged, and motivated market actors are essential to any program's success.

References and Resources

Market and Technical Information

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Program Information

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<http://www.cee1.org/resid/rs-lt/05rs-lt-progsum.pdf>

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California Statewide Residential Sector Energy Efficiency Potential Study, 2003
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Economically Achievable Energy Efficiency Potential in New England, 2005
http://www.neep.org/files/Updated_Achievable_Potential_2005.pdf

Illinois Residential Market Analysis, 2003

<http://www.mwalliance.org/programs/markets/FinalReport2003May.pdf>

Efficiency Vermont's Lighting Guide

www.encyvermont.com/Docs/EV_LightingGuide6.18.03.pdf

ENERGY STAR Residential Light Fixture Program Website

www.energystar.gov/index.cfm?c=fixtures.pr_light_fixtures

Database for Energy Efficient Resources (DEER). DEER is a database designed to provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL).

<http://www.energy.ca.gov/deer/index.html>