

**Voices for SSL Efficiency:
Opportunities to Partner and Participate
July 16-17, 2007 ■ Boston, MA**

DETAILED CASE STUDY FOR BREAKOUT SESSIONS

Residential-Use Recessed Can Fixture

A core activity of the DOE SSL Market Introduction Workshop will explore case studies based on five hypothetical SSL products intended for various market applications. Workshop attendees will participate in one of the five case study breakout sessions.

This exercise is a vehicle for determining how DOE commercialization plan elements will best support the market introduction needs of new SSL products. It will serve to identify major stakeholders and the elements of the DOE programs where their participation will be most valuable. And it will provide valuable feedback to improve the design of DOE programs.

The Assignment

Each breakout group will consider one case study, working together to:

- Outline a general strategy to sell their target product, identifying issues that are particularly important for that product, such as barriers to overcome, critical information needs, involvement of critical trade allies, etc.
- Consider which elements of the DOE commercialization programs can best support their strategy and how. Could there be improvements?

The case studies include a lot of questions, provided to help you think about the issues. Some may apply, and some may not. The group doesn't need to address all the questions, but should address the questions and issues that are most important for this case study.

Case Study Structure

Each case study includes:

- An Introduction that identifies the product and places it within its intended market segment, outlining competitive advantages and disadvantages.
- The Product Description offers additional detail on performance.
- Pricing further defines the market served.
- Other Considerations are things the group may want to think about specific to this product.

Please note: The case study products are *hypothetical* products with *plausible* performance parameters (or that's the intention). In many cases, they would be technically challenging to produce today, but that doesn't matter for this exercise. Don't worry too much about the performance or market numbers, or spend time re-designing the product. This information is provided in the case studies only to help you understand the issues related to this product.

Residential-Use Recessed Can Fixture

Introduction: The target product is a residential-use recessed can fixture including the lamp and driver electronics. The LED light source, while specifically designed for the fixture, is configured as a replaceable module to enhance serviceability over the life of the installation. This product is intended to compete with incumbent energy-saving alternative, a pin-based compact fluorescent built-in residential light fixture with a 17W source (nominally 1000 lumens). The product placement is such that the LED luminaire offers much better energy efficiency and good economic value when compared to the comparable installed CFL luminaire. An important consideration in marketing will be gaining public recognition and acceptance of the difference between the quoted CFL *system* efficacy, which makes it appear to be better than the offered SSL product, and the *luminaire* efficacy for which the LED comes out ahead. Considering the true energy savings, the life cost of the LED, despite its higher first cost, is competitive with the conventional alternative.



Product Description: Luminaire efficacy of the LED downlight, as an integrated fixture, is 50 LPW for delivered light. This figure is better than four times as efficient as an incandescent or halogen reflector lamp, and approaches five to six times the efficacy of these lamps as installed. It is also significantly more efficient than the pin-based CFL downlight. For the CFL, the published source efficacy is about 60 LPW but the fixture delivers less than that to the work surface. The typical downlight as installed has a luminaire efficacy of about 30 LPW. The life of the lamp portion of the product is *conservatively* expected to be about 16,000 hours, which is better than the CFL or halogen competition in this regard (10,000 hrs.). While further study may show that the LED lifetime is actually longer, questions about the driver electronics and limited operational data at present do not support a claim of longer life. As it is, this translates to somewhat over seven years' life in normal use (4 hrs/day), which makes it very attractive.

Pricing: The price of conventional residential-use recessed can fixtures varies widely depending on type and decorative features, so a range of approximately \$60-80 should be assumed, including the light source. Replacement lamp cost for the incumbent technology (CFL) is about \$6. Installation of the SSL product is similar to that of the CFL fixture. At \$75, the new LED product is priced on the high end of the overall price range, but is well above a comparable design, which would be nearer the low end on price. The higher price is not justified by any special design features, but is thought to be justified by the energy savings and the long life of the product.

Other Considerations: This product competes with conventional replacement light sources (CFL and incandescent) for existing installed down-lights, which number in the millions. The LED light offers very substantial operational savings over the incandescent option, and should be an easy sell for that case. In the case of the CFL, the economic argument, while still good, is tighter, but another useful selling feature is that the LED is fully dimmable while the CFL is not. The product as designed requires that the entire LED fixture be installed, as the replacement module is intentionally not compatible with existing fixtures since using the module with a conventional fixture could lead to lower performance, heat transfer problems, and perhaps even a fire hazard. Given this situation, it is likely that the addressable market, at least initially, will be limited to new construction (or remodeling) absent special incentives of some sort. One question to consider would be if such an incentive is warranted, and what would it need to look like.

The replacement module is not expected to be widely sold because of the long life of the LEDs, but is necessary to give consumers a level of comfort with the new technology. Its part cost is about 80% of the entire fixture cost, but replacement is simple and can be done by the homeowner. The replaceable module concept also allows the possibility of an upgrade in the future to accommodate the rapidly advancing performance of the technology. This feature may be a useful selling point and may also make the product more attractive to several existing sales channels.

The Market: On the order of 25 million residential-use recessed can light fixtures are sold in the U.S. each year, mostly for new construction or remodeling. The installed base is much larger, but is not considered an attractive target for the new SSL product because the entire fixture would need to be replaced. Many parties may be involved in the selection of a lighting fixture for residential applications. Depending on the type of home and whether or not it is custom built, any of the following may have a role: owner, architect, builder, decorator or designer, electrical contractor, and even the electrical distributor. In retrofit situations the occupant has a larger role than in new construction, where the builder or electrical contractor may make the decision. Replacement lamps for the incumbent technologies are sold by a host of outlets ranging from wholesale lighting distributors to retail big box stores to the neighborhood grocery. There would not be a substantial general replacement market for the SSL product, although several channels could carry the integrated fixture and replacement modules. A considerable consumer education effort may be required to make this transition.

The Assignment

Your Job: Your assignment is to design a marketing strategy for this product. The market strategy will need to address squarely pricing and performance issues in dealing with a complex combination of decision-makers and some marketplace confusion as to the difference between luminaire and system efficacy. Your company is a new joint venture between a small engineering company and a mid-sized manufacturer of conventional lighting fixtures. This is your first SSL product – in fact it is your first product as a joint venture. DOE has developed a plan that will involve many public organizations such as government agencies, utility companies, state energy efficiency organizations, industry organizations, and others. They have begun important educational, technical support, and standardization activities intended to accelerate market development. Most activities, however, are not directed at any particular market segment or product type. An important aspect of this market development exercise is to determine how you can most effectively use these programs to achieve your goals. How should DOE or the other organizations apply or improve these programs to best support the needs of this target product and market?

The Task, Part I: Frame the general outlines of the marketing strategy.

- Where are the weaknesses in the incumbent products that can provide new opportunity? How can you exploit them? What are the key competitive barriers to success? What are the technological barriers to success?
- How can you best exploit the energy savings inherent in this product to foster market acceptance?
- What has to happen for a successful market introduction of an energy-efficient residential-use recessed can fixture? Define “success.” What are your unit sales goals for the first year or two?
- What segments or niches of this residential market might be particularly appropriate for initial attention? Who are the influencers in these segments?
- What buyer behaviors will need to change in order to achieve success? What are the barriers to these changes? How can you address them?
- What are the appropriate sales channels? What sort of activities will you need to engage these outlets for your product?
- What other barriers do you perceive to marketing of this product?

The Task, Part II: Identify the roles of the government and non-government agencies and organizations. What market introduction options could DOE (and its partners) initiate?

- In the table below are listed some potential market-assisting activities that many public and industry organizations may be willing to support. Which do you think would be most useful? How would you apply these activities to your overall plan?
- Which activities are not useful for this particular product? Why? Could they be improved?
- What other elements would you add to this list?
- You have heard about the commercialization activities at the DOE. Which elements of the DOE plan would best contribute to your market plan?
- What other groups will be most important to engage to achieve success? With which aspects of your plan can they most usefully assist?

General Comments and Advice:

- Your team has limited time to put together a solution to this assignment. For best results (and most useful for this workshop) spend only a portion of the first day's breakout session on Part I and do some brainstorming on Part II. Use the second day breakout to complete your evaluation to tidy up your presentation.
- Don't spend a lot of time debating the numbers in the case study. The idea is to give you something concrete to work with, not to give you a review of the lighting market or for you to design a specific product.
- Give your product a name. Make it sell!

Campaign elements	Stakeholders and roles[*]	How could you use this element for this product?
<i>Buyer Guidance</i>		
a) ENERGY STAR® Criteria		
b) Design/Purchasing Guidance		
<i>Design Competitions</i>		
a) Lighting for Tomorrow (Residential Fixtures)		
b) Commercial Fixtures Competition		
c) Lighting Design Competition for Exterior & Interior Spaces		
d) State-of-the-Art LED Luminaire Showcase		
<i>Technology Demonstrations/Procurements</i>		
a) Demonstrations of Market Readiness		
b) Demonstrations to Test Field Performance		
<i>Commercial Product Testing</i>		
a) Commercial Product Testing Program		
<i>Technical Information</i>		
a) Information Development and Dissemination		
b) Technical Information Network		
<i>Standards and Test Procedures</i>		
a) Standards/Testing Procedure Development Support		
<i>Coordination/Leadership</i>		
a) Facilitating and Coordinating Local and Regional Efforts		
b) Federal Government Leadership		
<i>Other</i>		

^{*} Stakeholders: Standards organizations, manufacturers, industry associations, commercial lighting distributors, residential lighting showrooms, retailers, ESCOs, EEPs, utilities, state energy efficiency programs, large purchasers, energy efficiency advocates, others...

