

# Watt's Next for Nonresidential Lighting Retrofits

*Dulane Moran, Research Into Action, Portland, OR*  
*Bobbi Tannenbaum, Research Into Action, Madison, WI*  
*Caroline Chen, StatWizard, Coronado, CA*  
*Nathaniel Albers, Research Into Action, Portland, OR*

## ABSTRACT

Advances in nonresidential lighting technologies, such as LEDs, offer the opportunity to substantially decrease lighting loads in existing commercial buildings. Designing programs to accelerate their adoption in the retrofit market introduces old and new challenges. Like previous lighting efficiency product improvements, the costs for new products are high, product claims (such as very long lamp life) are unproven, and products to address myriad applications are still being developed.

In California, stringent Title 24 (lighting) and Title 20 (controls) code requirements, effective in 2014, will apply to a larger portion of the retrofit market. The impact of this is unknown, but it may result in fewer lighting retrofit projects – both overall and program-qualified – due to project expense. Whether in markets such as California (where code will push the adoption of AL) or elsewhere, retrofit programs must adapt to the rapidly changing product market.

Market actors believe LEDs and other AL products will dominate the market in the next five years. Many still see a role for programs, both to reduce initial costs and to provide credibility to AL products. The rapidly changing market, with new products, new manufacturers, and inconsistent product quality increases the risks for customers and some upstream market actors. Lighting retrofits are often driven by a lighting contractor and do not include a designer. Contractors, who favor equipment they are familiar with and are the least knowledgeable about new technologies, may be the only source of information for end-users. This presents opportunities and new considerations for lighting retrofit programs. It points to upstream strategies, in addition to end-user incentives, to increase the adoption of AL strategies in lighting retrofits.

This paper is based on 69 in-depth interviews completed in fall 2012, with manufacturers' sales representatives, distributors, and installation contractors serving the California lighting market. We discuss the lighting retrofit market, barriers to the adoption of AL, and the implications of our findings for lighting retrofit programs.

## Introduction

Advanced lighting (AL) refers to a group of design and installation choices that result in energy efficient and effective lighting. As described in the New Building Institute's (NBI's) Advanced Lighting Guidelines, (ALG, see <http://algonline.org>) this includes multiple considerations that value the quality *and* quantity of light provided by considering luminous intensity, color rendering, reflectance, and other factors that ensure a lighting system addresses the needs of the space inhabitants. The broad design qualities discussed in the ALG can be difficult to apply to retrofit projects, but are increasingly affecting the products and codes that guide lighting retrofits. Requirements for daylight harvesting and photo-dimming are examples of AL strategies commonly installed in California. Advanced lighting can also refer to the technologies or products installed, particularly when these products result in reduced lighting power density.

This paper describes what we learned from 69 in-depth interviews with market actors involved in delivering commercial lighting retrofits in California. We completed these interviews with installation

contractors, distributors, and manufacturers’ representatives as part of a project for Southern California Edison and Pacific Gas and Electric Company. This paper is also informed by a literature review completed as part of the project. The project addressed lighting retrofits only. Our objectives included better understanding who is involved and how upstream market actors approach lighting retrofits and influence what technologies are installed, and assessing their knowledge and attitudes toward specific lighting technologies. Project sponsors were also interested in identifying and understanding any differences across three market segments: retail, restaurants, and office buildings, which have high lighting intensities.<sup>1</sup>

We anticipated that awareness and adoption of AL approaches (as described by NBI) might be low in the retrofit market and thus asked questions about specific AL technologies that could be deployed in the retrofit market. These technologies were LED lamps, LED replacement for High Intensity Discharge lighting, dimming ballasts (step and continuous) and lighting controls.

### Retrofit Market Sample Population

The research team interviewed three groups of upstream market actors: installation contractors, distributors, and manufacturer representatives. We developed contact lists from several sources. The majority of the contact names were from utility databases (Southern California Edison and Pacific Gas & Electric). We expanded these lists with contacts provided by the NBI and internet searches. Table 1 shows the Sample Frame, Sample, and Interviews by respondent group.

**Table 1. Sample and Disposition**

Contact Type	Sample Frame	Sample	Interviews <sup>a</sup>
Manufacturer Representative	76 <sup>b</sup>	36	19
Lighting Contractor	734	121	39
Distributor	144 <sup>c</sup>	33	11
Total	954	190	69

<sup>a</sup> Includes some partial completes (4 contractors, 1 distributor, 2 manufacturer representatives)

<sup>b</sup> Sample frame included 25 manufacturers’ representatives provided by market informants

<sup>c</sup> Included 104 distributors identified through on-line search queries, but most IDIs completed from utility contact list.

The majority of the sample frame was obtained from utility databases. This is thus a non-random sample that includes some self-selection based on prior program engagement. Self-selection bias is a problem in qualitative research if it affects the range of responses on the items of interest. The population of lighting installation contractors in the utility databases was large. The range in types of contractors, the business sizes, and the varied responses to our questions indicate that we covered a wide range of installation contractors. The eleven distributors interviewed included a very wide variety of distributor types. In this case, some of the distributors did not fit the typical description of a lighting distributor, as they also manufactured lighting products. The respondent distributors covered a wider spectrum of distributor types than we had anticipated. Almost one-half of the manufacturer representative respondents worked directly for a manufacturer, and most of these manufacturers were small, with limited product lines. The other half worked for manufacturer representative sales agencies that sell product lines for multiple manufacturers, which represents the majority of manufacturer representatives. Both the distributor and manufacturer representative groups included firms that played multiple roles in the market and blurred the distinctions among the market actor types. These were

<sup>1</sup> California Commercial End-Use Survey, 2007.

generally businesses with a new lighting product or approach, and the result of rapidly changing lighting market that allows for new entrants.

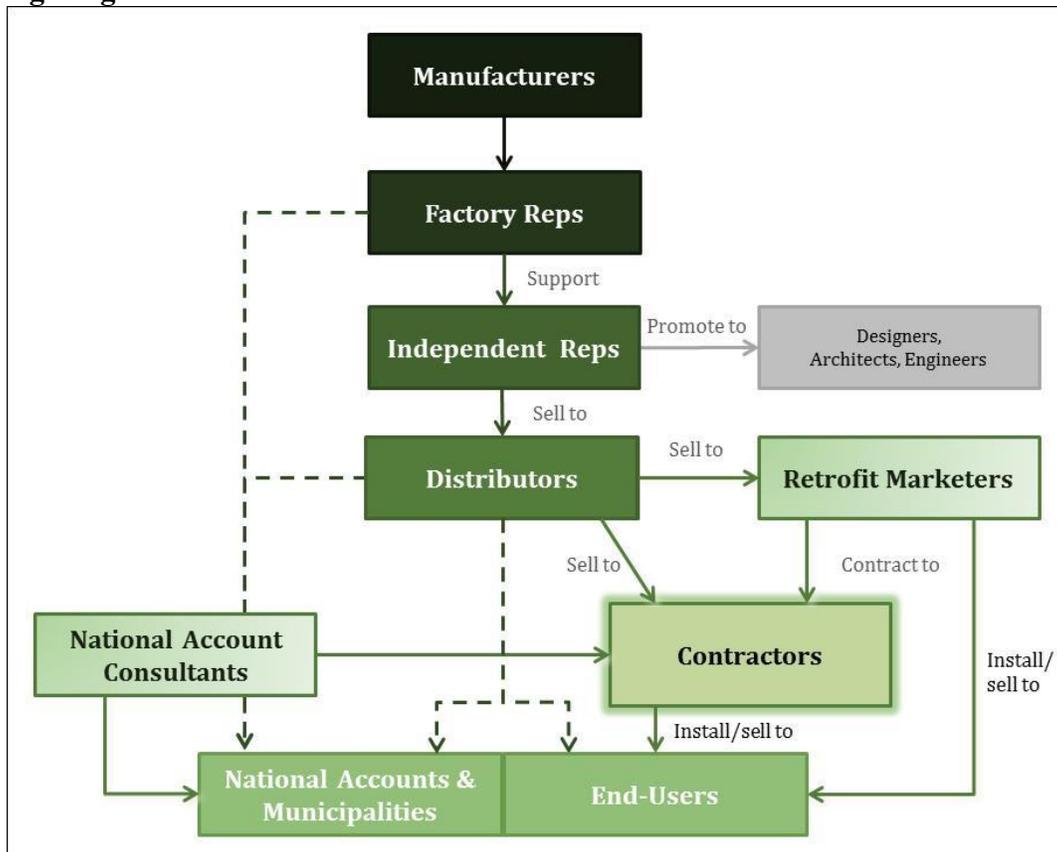
The reader should keep in mind these differences (relative to the general population of market actors). The findings are solid, in that they represent the experience, attitudes, and approaches of the market actor respondents. They likely reflect the range of experience, attitudes, and approaches of most of the market actors in California. The emphasis or relative frequency of some of the findings may differ from the population.

## Retrofit Market Description

In this subsection we discuss the market actors involved in lighting retrofits. In addition to installation contractors, distributors and manufacturers’ representatives, the research plan included designers. After interviewing two designers, consulting with the team’s market expert, and reviewing content from other market actor interviews, the team concluded that the design community rarely plays a role in lighting retrofit projects, which has implications for the adoption of AL in that market.

Through our interviews and discussions with lighting market professionals we identified two additional groups that play a role in the commercial lighting retrofit market; national account consultants and lighting retrofit marketers. Figure 1 below shows the market actor roles and points of influence.

**Figure 1. Lighting Retrofit Market**



## **Manufacturer Representatives**

A manufacturer's representative is a lighting sales representative that promotes specific product lines, generally to wholesale distributors and the design community. Manufacturer representatives fall into two broad categories: 1) factory representatives and 2) independent sales representatives.

The manufacturer factory representatives typically work directly for a single manufacturer to increase sales of that manufacturer's product. These representatives typically have large sales territories that may include multiple states. Factory representatives tend to work for large international companies that offer a large range of lighting products. These manufacturer representatives spend a substantial amount of time supporting independent sales representatives. They call on independent sales reps and promote products through them to designers and distributors. They may assist them by providing trainings or technical services for the designers or distributors. These factory representatives may also work with large customers (such as chain accounts) to make sure their products are considered in retrofit or new construction projects.

Independent sales representatives represent multiple manufacturers and serve distributors, the design community, and large organizations such as municipalities or corporations. Independent sales representatives tend to have a smaller, more specific territory and maintain extensive relationships with key market actors within their territory. Independent sales representatives will typically represent one large manufacturer and a variety of specialty manufacturers. These representatives spend time educating, updating, and providing literature or information to their clients: the architects, lighting designers, engineers, contractors, and distributors who need to remain current so they can support the sale of specific product lines. Independent sales representatives will also arrange for factory representatives to conduct specific trainings when the factory representatives come to town. Large organizations, those that represent up to 100 manufacturers, aim to supply every lighting product a project could entail, whereas smaller organizations, those that represent 10 or 20 manufacturers, tend to specialize in an area such as landscape lighting or exterior lighting.

Interviewed manufacturer representatives varied in their type and the services they provide and included both independent sales representatives and factory representatives. Some representatives served large end-users directly, whereas others served distributors, and still others primarily served designers. A large manufacturer representative firm will have staff that serves each of these customer types whereas smaller firms may focus on one of these customer types.

Manufacturer representatives are the most knowledgeable about AL options, and the most motivated to promote them in the market. Manufacturer representatives focus their efforts promoting products to the design community, which is rarely involved with retrofit projects, and to distributors, who are responsible for the flow of products to contractors and end-users. Manufacturers' representatives expect the design community to convince end-users of the value of AL and their product. The product is then sold through the distributors.

Manufacturers encourage distributors to carry their AL products through negotiations on a package of the manufacturer's products the distributor will carry. The manufacturer may offer lower prices or better financing terms in exchange for the distributor carrying newer products. They may also offer incentives for sales of specific products within a limited time period. If the distributor is having trouble moving a product, the manufacturer's rep will provide assistance (usually in the form of guidance or training) to promote newer products.

Some manufacturer representatives work directly with large end-users, such as municipalities or large national chains. In these cases, they promote the AL directly to the customer, and likely work with them to find suitable applications for the products.

## **Distributors**

Lighting distributors buy merchandise from manufacturers and resell the merchandise to installation contractors or end users. Distributors may sell lighting equipment exclusively or they may sell a broad range of electrical equipment including lighting. Generally, a distributor in the commercial lighting marketplace does not sell product to the public. Rather, distributors focus on regional sales to installation contractors and commercial end users; a small number of distributors may serve national accounts. Lighting distributors sell large quantities of lighting product, and in some cases will provide value-added services to contractors, such as technical assistance on a complicated project.

Interviewed distributors ranged from traditional suppliers of electrical equipment including lighting to those that manufactured and distributed product directly to the marketplace. Some distributors reported also offering specification and technical assistance services to contractors and at least one does installation work similar to a contractor.

The majority of lighting products (some estimates are as high as 90%) flow through a distributor before reaching the end-user. A California market research study<sup>2</sup> reported that distributors influence the design or specification in two-thirds of replacement and minor/small scale projects. Despite this, the distributors interviewed did not report having a large influence on the efficiency of products installed in retrofit situations. Although they are involved with product selection for retrofit projects, this selection is more about equivalency (for light output) relative to existing lighting and less about influencing the overall retrofit lighting approach, which is sold by the contractor. Distributors point out that they are brand neutral, and are thus in a situation to identify what is best for the customer. As a trusted source for information, however, they are in a position to influence the contractor over time.

Distributors varied in their knowledge and attitudes toward AL. Awareness of products, as well as motivation to promote them also varied. They tended to view themselves as suppliers, not promoters. Distributors are motivated to move what is on their shelves and to provide what their customers (typically contractors) want. Most distributors stock based on what their customers (the contractors) are purchasing. Their engagement with end-users is limited. A small minority of distributors do sell jobs directly to the end-user (for installation by contractors they supply).

## **Installation Contractors**

Interviewed contractors fell into three basic types: 1) electrical contractors who work on a variety of electrical projects, 2) lighting specific contractors, and 3) energy contractors who do lighting retrofit work in conjunction with other energy efficiency improvements. Contractors purchase the majority of their lighting products from distributors.

For retrofit projects, end-users usually hire the contractors directly. Contractors have the highest level of engagement with end users on retrofit projects, and in most cases are the ones who sell the projects. This puts them in the best position to influence the efficiency of the products selected. Unfortunately, among contractors interviewed there was a wide range in knowledge of and interest in promoting AL. In general, they were less knowledgeable and motivated than other market actors.

Contractors want to ensure that the products they install are reliable and meet customer needs. Many expressed concern about the cost of AL products. Even those that promote AL expressed concerns about product quality for some newer products (and may communicate that to customers), and are sensitive to customer price concerns. They do not want to bid themselves out of a project.

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<sup>2</sup> Commercial and Industrial Lighting Market Research Study: Final Report, Volume 1; California High Bay Lighting Report. 2013 International Energy Program Evaluation Conference, Chicago

## Differences from New Construction

In new construction projects, an architect, engineer, or lighting designer will develop a lighting design for a building. This design has a significant influence on what is installed, although specifications can be altered as project timelines and budgets are adjusted. Design professionals are rarely involved in lighting retrofit projects. Although some retrofit customers may express interest in using a design professional, they are unwilling to pay the design costs in a retrofit situation (with is often focused on cost reductions). Retrofit projects that include a design professional tend to be larger, more complex, or have specific aesthetic requirements. In general, these projects are ineligible for the utility lighting retrofit programs.

Since designers are rarely involved, we asked the contractors, distributors and manufacturer representatives' questions to understand how lighting design, specification and calculations occur in retrofit projects. Specifically, we wanted to know how common these functions are and who completes them. For clarification, we define the terms below, based on how they are used for new construction and major retrofit projects:

*Design.* Design involves identifying the location and type of lighting that best fit the application. In new construction, this is typically done by a member of the design community (i.e., architect, design engineer, or lighting designer).

*Lighting specifications.* Specifications describe the conditions and product expectations; includes a fixture schedule that details the products with manufacturer and product number tied to drawings, and a visual reference to the specified product.<sup>3</sup> In new construction this is completed by a member of the design team and is generally part of the design. In retrofit situations a lighting specification that meets all these criteria is rare.

*Calculations.* Calculations are done to determine adequate light levels and to comply with applicable codes (including California's Title 24).<sup>4</sup> These are done for designs and lighting specifications.

We found lighting design to be rare for commercial retrofit projects, a design by a design professional even rarer. End-users are unwilling to pay for a design professional in most retrofit situations. When done, it is often for large and complex retrofit projects, when there are special lighting needs (for example in restaurants or art galleries), or when the project is not a one-for-one change out. For retrofit projects, designs are often completed by distributors or manufacturers, instead of by a member of the design community. (Some retrofit projects that engage design professionals may be too extensive to fall under utility new construction lighting program.)

The study findings on who provides lighting specifications for retrofit projects are less clear. Respondents in each of market actor groups said they did specifications in some situations. But in the ensuing discussion what they described is more akin to product selection.

Lighting level calculations are done for the majority (but not all) of lighting retrofits. They are done to meet code, ensure adequate lighting and to show energy savings. While most trade allies have the capacity to do lighting calculations within their firm, contractors or distributors are most likely to do lighting calculations for retrofit projects, when they are done.

Although not targeted in our interviews, we identified two additional market actors that play a role in commercial lighting retrofits.

*National account consultants.* These are firms hired by national chains (e.g., 7-Eleven) to handle lighting retrofits. They are responsible for determining, with the client, the lighting retrofit strategy for the client's stores. Since they are responsible for substantial lighting loads, they often

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<sup>3</sup> Architectural Lighting, The Lighting Specification Process, Jean Sundin, Sept. 29, 2008.

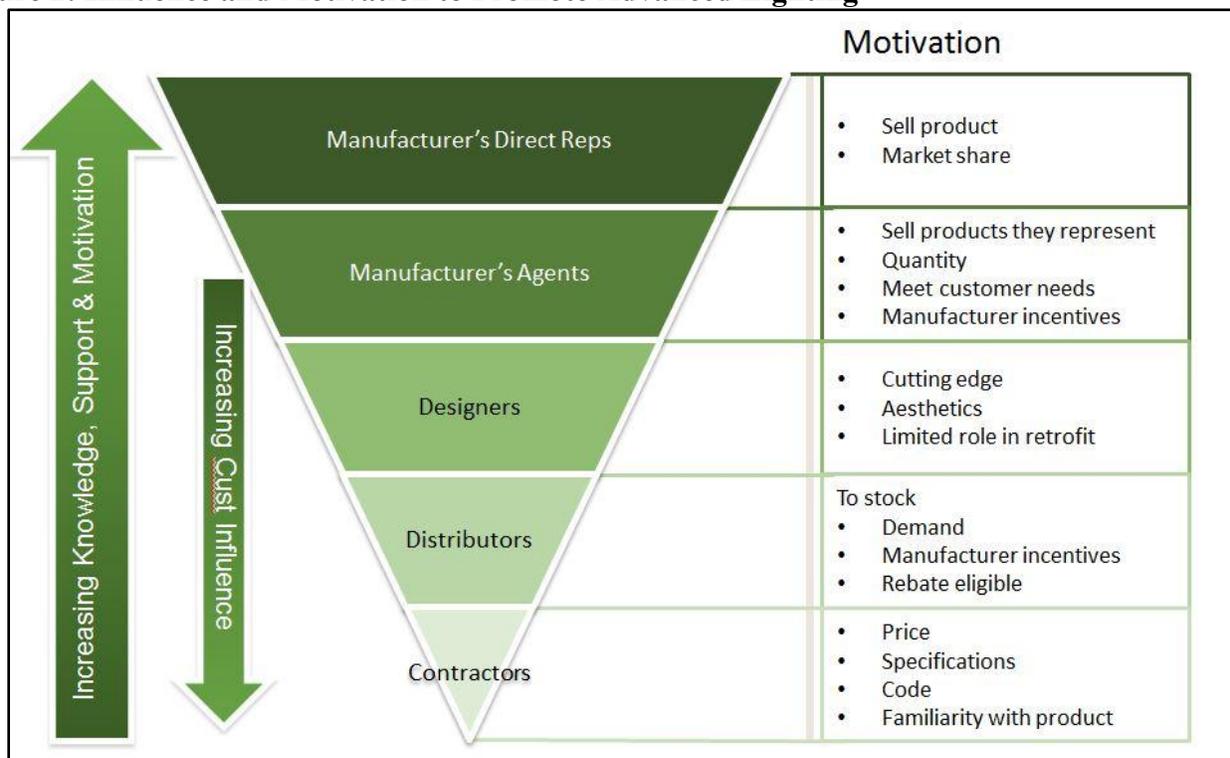
<sup>4</sup> Effective January, 2014 Title 24 codes will apply to any retrofit that involves 10% or more of the fixtures.

have direct relationships with manufacturer representatives, and are likely to be up-to-date on lighting products and opportunities for savings (as well as rebate opportunities). The products they specify flow through local distributors or are shipped directly by the manufacturer.

*Retrofit marketers.* In California, and likely other states with large lighting retrofit programs, there are firms that promote lighting retrofit projects that meet rebate eligibility requirements. We encountered a least one firm that sells the lighting retrofit projects to end-users, and then uses a set of contractors for installation. Other firms promote lighting retrofits in addition to their other work.

Within the retrofit lighting market we found that knowledge of - as well as motivation to promote - AL decreased as we got closer to the end-user. Missing in the lighting retrofit market is the designer, a market actor both knowledgeable and motivated to promote the new technologies. The functions filled by the design community – calculations, design and specification, are not necessarily completed in retrofit situations. Contractors are selling the jobs; primarily by promoting equipment with which they are familiar and think will sell. The contractor has the greatest amount of customer contact, but may lack the knowledge and comfort to promote AL products. As one manufacturers’ representative said” The contractor has the greatest amount of customer contact, but may lack the knowledge and comfort to promote the products.”

**Figure 2: Influence and Motivation to Promote Advanced Lighting**



## Barriers to Advanced Lighting

### High Initial Costs

Cost, especially high initial cost, was the most frequently mentioned barrier to installing AL products among all three market actor groups. Several respondents noted that this problem was exacerbated by economic conditions that have created reluctance to make any expenditure. Even when

end-users are willing to make lighting efficiency upgrades, the costs of AL relative to other (rebated) lighting equipment are very high, and paybacks are longer.

High first cost is associated with AL and controls, particularly when system upgrades are necessary to maximize the value of advanced controls. The high cost of commercial LED lighting fixtures was also mentioned.

Installation contractors also mentioned customer unwillingness to spend money on any lighting retrofit project, even those with paybacks as little as six months. Some pointed to current economic conditions; others said that there are customers who will never choose efficient options. Accessing these hard-to-convince and severely budget constrained customers is a perennial challenge.

*“Many of our commercial clients are still suffering from the recession and have put off retrofit work until they have funds to do it. Some are just doing repairs as needed and parts for the outdated energy gobbling fixtures are not available. So we change one fixture at a time.”*

*“I’ve quoted a payback at 3 months and they wouldn’t do it because first cost.”*

*“Cost is a barrier. Business owners are concerned about their bottom line. They have only a certain amount of profit and cash at their disposal.”*

Manufacturer’s representatives also pointed to price as a barrier. They often framed high first cost as requiring distributors and contractors to convince customers that the product is worth these costs. They believe that rebates and lower prices, which accelerate payback, will reduce this barrier.

*“There is no barrier other than price. [LED] products speak for themselves in terms of energy savings and lower maintenance costs.”*

*“Unless price goes down to fluorescent prices LEDs will not see full adoption. Right now LEDs are 4-5 year return on investment with current rebates. When ROI gets to two years LEDs will be an easy sell.”*

*“Price needs to be lower. For example induction is expensive, but people don’t understand the value of the fact that induction will last four times as long. Contractor wants to go cheap and make money up front and does not care as much about the longevity of the product.”*

Said another:

*“California has accelerated adoption because of laws. Manufacturers could always lower prices.”*

## **Knowledge and Product Awareness Gaps**

Our interviews with the market actors revealed variation in knowledge about AL products. Manufacturer representatives were very knowledgeable, and report that designers are interested in the products. Interviews with distributors and contractors revealed variation within both groups in knowledge of and interest in promoting AL.

Members of the design community, according to several manufacturers’ representatives, are likely to seek out information about new products. Designers are in general, interested in new technologies, and often are looking for lighting to fit specific applications. Manufacturer representatives promote products to the design community, anticipating that they will specify them in projects. Unfortunately, members of the design community are rarely involved in lighting retrofit projects.

Distributors and contractors do not have the same level of interest in convincing their customers to try something new. Contractors and distributors will follow specifications, but they are less likely to adopt new products quickly compared to the design community. The design community wants to be *cutting edge*, whereas contractors and distributors want to sell product they know.

Manufacturers said that it is harder to promote new products to distributors and contractors.

*“It is harder sell to, train, and explain new products [to contractors and distributors compared to designers]. It is harder to tell [contractors and designers] to sell a \$245 fixture over a \$105 fixture even when the payback is about two years on the \$245 fixture.*

A few distributors were fully aware of the products available, the applications for these products, and sought to get the products in the market. At least one distributor described taking contractors out on sales calls to end-users to educate them on how to sell the products. Most distributors, however, were did not report promoting any particular product and will stock what is demanded.

Contractors also revealed varying knowledge and interest in products associated with AL. They often pointed to high initial price as a barrier, which may have made them hesitant to promote them to customers. Many were unaware of the variety of products available and of their applications. This may have contributed to their selectivity in what they offered to the market segments. Our literature review supports this, in that it found evidence that contractors rely on familiar technologies to reduce callbacks, and that choice is often driven by availability and price.<sup>5</sup>

### **Risk/Product Uncertainty**

Both distributors and contractors appear to be risk averse, and several factors associated with new lighting technologies contribute them being perceived as risky. High initial costs were mentioned in conjunction with these factors, exacerbating the perceived risk.

*Unproven product claims.* According to several respondents, customers are more likely to accept higher first costs if they trust the product and the specifications of the product, particularly product lifespan. One contractor reported that he tries to assure his customers about manufacturer claims regarding product lifespan, but customers are reluctant to purchase the product once they know the price.

*New, unknown manufacturers.* There are numerous new LED manufacturers. One contractor stated that manufacturers with long histories in the lighting marketplace (e.g., Sylvania, Phillips) have an advantage in selling products compared to an unknown manufacturer because contractors (and customers) are more willing to trust a product from a brand they recognize and already trust.

*Varying quality.* Contractors discussed challenges in identifying “garbage LEDs” and wanted to see poor quality products taken off the market faster. Several contacts brought up the Design Lights Consortium (DLC), but noted that DLC efforts were not sufficient to identify reputable products. Contacts noted that regulations might not be strong enough, particularly around power factor versus color temperature and lumens per Watt.

*Rapidly changing product market.* Distributors share the uncertainty around product performance and see a risk associated with carrying inventory that may not sell. They fear that products will be replaced with something better and cheaper (particularly in the rapidly evolving markets for LED products and wireless control systems). This makes them reluctant to order stock that could become a liability.

*Compatibility with existing controls.* A manufacturer’s representative and other experts we talked to identified potential compatibility issues between new products and existing controls.

One manufacturer’s representative captured many of the concerns in a single statement:

*“Cost is a barrier, as is the difference in quality of technology. A lot of manufacturers build advanced products but there are sometimes problems with reliability—things not lasting as long*

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<sup>5</sup> Xenergy, Inc. "Commercial and Industrial Lighting Study." Prepared for the Northwest Energy Efficiency Alliance. 2000. Cited in a 2012 D&R literature review completed as part of this project.

*as promised. There can be problems with new technologies working with existing controls, a vendor not known in the industry, unknown lifetime of new products, and products untested in the marketplace.”*

## **Stricter Lighting Codes**

California’s 2013 codes (Title 24 for lighting and Title 20 for lighting controls) become effective January 21, 2014. These codes are stringent and will apply to a greater percentage of lighting retrofit projects than earlier codes. Among other changes, the code mandates day lighting sensors to adjust lighting near windows, reduces lighting power density requirements, and reduces the percentage of light fixtures that can be altered (from 50% to 10% ) before code compliance is required. The code also adds buildings less than 10,000 square feet to those required to have lighting power demand response capability.

These lighting code requirements will increase the costs of all lighting retrofits that meet or exceed replacement of 10% of the fixtures. The lower power density lighting itself is generally more expensive. The inclusion of dimming ballasts combined with controls further increasing the costs for retrofits. The requirement of lighting power demand capacity in smaller buildings further increases costs for those businesses.

Wireless controls could improve the economics of lighting controls. Contacts described wireless controls as an opportunity for retrofit projects because they avoid the costs associated with hard wiring. According to one distributor, controls in retrofit projects have been cost prohibitive but wireless controls systems are bringing the price down.

The impact of more stringent (and thus costly) code requirements, as well as their application to a greater percentage of retrofit projects, is uncertain. At least one respondent thought that the additional code requirements could result in fewer lighting retrofit projects overall.

## **Role of Incentive Programs in Lighting Adoption**

Utility program awareness and tracking of rebates was high among all trade ally groups. Contractors and distributors use the utility websites to keep current on what equipment is eligible. Manufacturers keep up on programs to assure that their products are included. One respondent who worked for a major manufacturer had responsibility for keeping track of lighting rebate programs throughout the United States. Distributors consider what is rebated when determining what to stock.

## **Utility Programs Drive Projects**

Most of the respondents said that utility program incentives lower the cost of projects and this encourages customers to take action, leading to increases in project or product sales volume. Many viewed the programs as a “win-win” for all parties involved.

*“Utility programs induce the customer to do the job.”*

In addition to encouraging action in general, several noted that incentives specifically help promote the newest efficiency technology in the marketplace by helping to overcome barriers associated with price and familiarity. Incentives help trade allies to sell more advanced products and more expensive projects than they could do in the absence of utility programs.

Several distributors indicated that programs affect what they stock and sell. As one distributor noted, programs create demand for products, which affects stocking. This can create changes in the product mix offered to end-users.

## Credibility by Association with Utility

Respondents also noted the credibility and legitimacy that utility programs convey to customers. For manufacturer's representatives the credibility is for their products, while for contractors it is for their work. Several manufacturers' representatives said their customers like to know that the products they are offering are endorsed by the utility. Utility approval makes customers more comfortable installing a new product.

*“Anytime a utility is willing to stand behind product, it adds credibility to process and products.”*

Another manufacturer's representative elaborated on how new technology-development funds offered by utilities make it possible for an end-user to install a new product at little or no cost in order to see how the product performs and understand the customer experience. This new technology incentive *“helps prove a product in a case-study like format.”* These case studies can be used to demonstrate the pros (and cons) of a new product.

Another contractor appreciated SCE's documentation of energy savings. Providing customers with SCE documentation *“makes selling jobs easier”* by legitimizing the project to the customer.

## Utility Program as a Mixed Blessing

Several respondents had comments about incentive programs in general, and specific to AL technologies.

Two general program comments addressed the programs relative to the current market. Some found that the combination of third party and utility lighting rebates to be confusing. This was in part because the rebates differed, and the availability of third party funding was inconsistent. Another issue was the three year program cycle, where at least one respondent felt this impeded the programs' responsiveness to changing products.

Several respondents noted that the utility retrofit programs set up competing incentives, and that the AL products cannot win. They point out that the incentives for LEDs are inconsequential relative to the price. And, project paybacks are substantially longer than paybacks for other incented products with smaller initial costs. They suggested eliminated rebates on more standard products.<sup>6</sup> One respondent thought the utilities should let the market play out for a while, before promoting AL technologies.

## Implications for Lighting Retrofit Programs

The interviews made several aspects of the commercial lighting retrofit clear. First, AL products, especially LEDs will dominate the lighting market in the next five years. Second, the market is developing rapidly; in California because of code changes; in the nation due to the quality, flexibility and durability of the new lighting technologies. Third, the lighting retrofit market is challenging to transform – the market actors most engaged with end-users have limited knowledge and motivation to promote AL, and end-users are looking for quick paybacks and low initial costs.

In a rapidly evolving market existing within a system of changing codes, one could argue that the market simply needs more time to adapt and mature. The fact that market actors are unaware some products and skeptical of product claims for others is not surprising, and will likely resolve itself eventually. On the other hand, it provides an opportunity for energy efficiency program proponents to

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<sup>6</sup> For calculated incentives, the California utilities will offer a tiered incentive structure for the 2013-15 program cycle that distinguishes between “basic” and “targeted” measures. Targeted measures include those that are new, emerging, costly, or hard-to-reach. This change means that instead of paying \$.05 per kWh saved through lighting upgrades, the IOUs will pay \$.03/kWh for basic and \$.08/kWh for targeted. Targeted lighting includes LED retrofits and Advanced Lighting Controls.

accelerate the development and adoption of certain products. A key question for nonresidential lighting retrofit programs in 2013 is what, if any role, should programs play in this evolution.

Some program administrators may choose to stand on the sidelines until the product market matures. Early promotion of CFLs created negative consequences, as product longevity and light quality were common early problems. But if one does wait, how does a program administrator determine the right time and how to intervene? And if the sidelines are not the place to be, what is the programs' role? Regardless of where you stand on the role of programs in accelerating the adoption of AL, there are clear set of items for consideration. These include:

*Acknowledge the effects of competing products and programs.* Similar incentive levels for common and AL energy efficient lighting may stall AL technology adoption. These costlier products need higher incentive levels to overcome barriers associated with cost and uncertainty.

*Embrace the role of incentive programs.* Incentive program address initial cost (and thus accelerate payback) of the products. AL costs relative to existing efficient lighting options makes adoption challenging, even with rebates. The utility incentive also increases the credibility of the products – it is a tacit endorsement.

*Reconsider the definition of lighting retrofit.* Defining retrofit as a one-for-one replacement does not take full advantage of new product capabilities. A one-for-one replacement is at odds with the comprehensive nature of AL, which addresses quality, day lighting, and controls.

*Identify a low-cost approach for increasing the presence of design in retrofit projects.* The lack of design community involvement in retrofit projects limits knowledge and innovation. Both contractors and end-users have less exposure to the products that are available, and thus the options are constrained. Light quality and other AL consideration likely are not well addressed and so opportunities are missed.

*Test strategies for reducing distributor risk.* Although product availability was not identified as a barrier to AL, distributors are motivated to sell what is on their shelves. What options do program administrators have to reduce distributor costs of holding equipment, and risks associated with leftover stock?

*Accelerate new product vetting.* Delays in product testing and verification create uncertainty in the market and prevent access to equal information about product performance. Identifying strategies through which new technologies can be more rapidly embedded in energy efficiency programs will increase deployment.

*Develop a strategy for transitioning lighting retrofit contractors to more comprehensive lighting approaches.* Changes in the linear florescent regulations and local codes mean that many contractors will need to use more advanced calculation and design tools. Programs need to start testing strategies for evolving the services this market provides.

## References

Evergreen Economics and Research Into Action, Inc. 2013. *Commercial Lighting Retrofits—Targeted Market Research* (Draft).

Heschong Mahone Group, Inc. 2013. *Comprehensive Commercial Lighting Initiative Pilot Evaluation Report*. Report #E13-252. Prepared for the Northwest Energy Efficiency Alliance.

Southern California Edison. Program Implementation Plans 2013-14 Program Cycle. Exhibit 4A – 23 April 2013.