The New York Energy $mart[SM] Small Commercial Lighting Program: A New Model for Lighting Market Transformation Programs

Marilyn J. Dare, New York State Energy Research and Development Authority
Bruce Appelbaum, ICF International

ABSTRACT

Promotion of energy-efficient lighting technologies has been part of almost every energy efficiency initiative nationwide for years. Prescriptive rebates for these technologies are a well-established part of these programs. However, this approach does not require proper application of energy-efficient lighting technologies, often resulting in over- or under-lighting, uneven lighting, uncomfortable glare, and poor color rendition.

The **New York Energy $mart[SM]** Small Commercial Lighting Program (SCLP), implemented by The New York State Energy Research and Development Authority (NYSERDA), promotes effective, energy-efficient lighting–**The Right Light[SM]**–emphasizing proper lighting design and deployment. By training over 1,300 lighting practitioners (lighting contractors, distributors, designers, and manufacturers and their representatives), SCLP has proven that energy-efficient lighting and high-quality illumination are not mutually exclusive. The SCLP design model has been accepted by the small commercial sector–nearly 580 qualifying projects representing almost 4 million square feet of projects have been implemented, with annual end-user energy savings exceeding 26 GWh.

SCLP's lighting design model requires conformance with specific requirements for on-task light levels, lighting uniformity, glare, and color rendering and that the project lighting power density be 10% below that allowed by the State regulations. Lighting practitioners receive incentives of up to $1,000 ($800 for designers) for implemented lighting projects that meet these design criteria. End-users are also eligible for incentives under other NYSERDA programs to help buy down the first cost of the technologies.

This paper describes how SCLP interacts with New York lighting market players, the SCLP design model, and the lessons learned in the evolution of this innovative lighting market transformation program.

Background

Promotion of energy-efficient lighting technologies has been part of almost every energy efficiency initiative nationwide for years. Prescriptive rebates for these technologies are a well-established part of these programs. These types of programs typically encompass lighting system retrofits on a socket to socket basis and do not address the issues of lighting quality and the impact of lighting quality on the people who use the affected spaces (CEE 2005). For example, while many lighting programs have adopted the Consortium for Energy Efficiency's (CEE's) specification for High Performance T8 systems on a prescriptive basis, they do not address the lighting quality issues that may result from a one-for-one retrofit of these higher lumen output systems. Typical impacts of poor lighting quality include the following.

In offices, direct glare from overhead lighting fixtures can cause discomfort to persons using the space (Ngai 2000). Reflected glare on computer monitor screens can interfere with

visibility, and light levels that are too high or not high enough can impact the ability of people to do their work.

In retail businesses, lamps that do not accurately render colors can distort product appearance, which can have a negative impact on sales.

In warehouses or stockrooms, lighting that is not uniform both vertically and horizontally can contribute to the wrong products being pulled and shipped, which can result in higher operating costs for restocking and reshipping.

Introduction

The **New York Energy $mart**[SM] Small Commercial Lighting Program (SCLP) was established in 2000 by NYSERDA to overcome the limitations of poor lighting design, through the application of effective, energy-efficient lighting design. ICF International is the Program Administrator, and, along with The Lighting Research Center at Rensselaer Polytechnic Institute (LRC), developed the Program design and implements the Program for NYSERDA.

The SCLP design model results in lighting systems optimally designed to meet specific application and energy efficiency needs. The systems should be easy to use, aesthetically pleasing, and enhance the visual capability of people using the space. This requires both the proper selection of technologies, and the proper system design and layout. The result is lighting that allows people to do the work they need to do in a pleasing, comfortable environment. Utility bills are lower, and people are happier and more productive; the effect of lighting quality on productivity has been documented by the Light Right Consortium (LightRight 2003). SCLP has captured this concept in SCLP's tagline–**The Right Light**[SM]– which has become the brand associated with the program.

As a market transformation initiative, SCLP partners with the lighting industry in New York State to change how lighting projects are designed, specified, and implemented. Program participants are drawn from the mid-market of lighting practitioners: manufacturers and their representatives; designers, architects and engineers; distributors; and contractors. There has been very little direct interaction with end-users, with the exception of recent efforts to increase their awareness of the benefits of good lighting design.

SCLP focuses on the hard-to-reach small commercial sector, where end-users are less sophisticated. Our definition of "small commercial" is liberal: it is based on the size of the project (from about 1,000 to about 25,000 affected square feet[1]), not on the size of the building or the size of end-user's space within the building. It can also include almost any type of commercial space, except those used exclusively as residential spaces.[2]

One of the cornerstones of SCLP's continuing implementation is its flexibility. SCLP has undergone many changes over the years to reflect the needs of the market and the market players who participate in the Program. These changes, more evolutionary than revolutionary, have been implemented as a result of both formal and informal market research and Program assessment activities. Changes in incentive offerings and amounts; training media employed; participant classification and focus; and most recently, a pilot marketing campaign to increase end-user awareness of high-quality lighting, have all been made over the last five years. These changes

[1] Originally, the upper limit for the affected space was 10,000 square feet. Feedback from Program Participants and an analysis of the marketplace resulted in changing the upper limit to 25,000 square feet.

[2] Only the common areas of hotels, apartment buildings, or dormitories are eligible: lobbies, hallways, and stairways; laundry or community rooms; banquet or function rooms.

have kept the Program from becoming stale and have maintained and enhanced Participant interest and activity.

The Nuts and Bolts of SCLP

SCLP is a market transformation program that works with the lighting mid-market in New York State to change the way that lighting projects are designed, specified, and built. It incorporates specific design metrics to ensure that lighting projects are not only exceptionally energy-efficient, but also provide high-quality illumination. It has long been recognized that lighting improvements are an effective way of reducing peak demand. SCLP seeks to do this in a manner that actually enhances the visual environment of persons working in the affected spaces.

As the first program of its type, it was difficult to get practitioners to think about quality, not just technology. Mid-market players in New York are used to years of prescriptive rebate types of programs: buy an energy-efficient product, get a check. SCLP is technology-independent. While certain types of lighting equipment are inherently more energy-efficient than others, SCLP looks at the entire lighting design, not just the energy savings or load reduction.

A major component of SCLP was recruiting and educating the lighting practitioners who would participate in the Program – and overcoming their preconceived notions that this would be yet another prescriptive rebate Program. Because this Program breaks the mold, a wide range of training, outreach, direct contact, and marketing and technical tools and resources are offered to Program Participants to recruit and retain them. The Small Commercial Lighting Program offers:

- training and self-qualification materials for Allies on effective lighting design and implementation;
- tools and resources that give guidance on designing and installing effective, energy-efficient lighting that meets specific needs and provides better illumination;
- access to Account Managers and Technical Specialists who can provide assistance with project designs, program tools and resources;
- assistance in incorporating the principles of effective, energy-efficient lighting design as part of a good business strategy;
- incentives for the design and implementation of projects meeting SCLP design criteria;
- cash awards for competitions based on the number and total floor area of small commercial spaces upgraded with effective lighting; and
- awards for chosen projects that demonstrate exemplary lighting designs in small commercial spaces.

These offerings are described below.

Participation, Recruiting and Training

SCLP participants are drawn from the lighting industry in New York (and those doing business in the State). SCLP "Allies" are classified according to their main line of business:

- **Ally Distributors** are electrical or lighting supply businesses, which must have a lighting specialist on its staff.

- **Ally Contractors** are electrical contractors or other businesses performing lighting installations.
- **Other Allies** include manufacturers, manufacturer representatives, or other lighting professionals supplying lighting equipment or services.
- **Ally Designers** are businesses that employ at least one individual to provide lighting design services for a fee. This class of Allies includes lighting designers, specifiers, architects and architect/engineering firms.

Originally, SCLP classified Allies only into the first three of the categories above. As experience was gained in the marketplace, we realized that in some parts of New York, designers were key influencers in many lighting projects. Recognizing their importance, we created the Ally Designer classification and developed tools, resources, and incentives specifically for this group.

Participation in SCLP has several prerequisites. Aside from the requirement that prospective Allies must fall into one of the four categories above, training is required. Most Allies were trained through a two-hour "live" session, offered through Ally Distributors, in conjunction with trade or professional societies, or those organized solely by the Program Administrator. An alternative self-qualification training process also was established allowing prospective Allies to complete the training at their own pace, and demonstrate their understanding of the Program by completing a 20-question examination.

The two-hour training program (and the self-qualification training) includes:

- an introduction to NYSERDA and the **New York Energy $mart**[SM] program;
- a description of SCLP incentives available;
- a definition of effective, energy efficient lighting design, along with examples;
- detailed descriptions of each of the design criteria;
- instructions on submitting projects for incentives;
- guidance on how to market effective, energy-efficient lighting to end-users; and
- descriptions of technical and marketing tools and resources available to Allies, including end-user incentive opportunities.

In addition to training, Allies are required to complete an Ally-specific Participation Agreement. This agreement defines the minimal requirement for Ally participation and the benefits available to the Ally.

Prospective Allies were recruited into SCLP in a number of ways. Originally, the model was to identify and recruit key electrical distributors throughout the State to become Ally Distributors. It was intended that they would then provide access to their electrical contractor customers and assist in recruiting and training them. A "hosted training" incentive (since withdrawn) was offered to Ally Distributors sponsoring a training session for prospective Ally Contractors, with a minimum attendance required. Few distributors took advantage of this incentive opportunity, and SCLP soon transitioned to regional recruiting and training activities ("mass trainings") that were organized by the Program Administrator, often in conjunction with electric utilities or professional associations. At this stage in SCLP's evolution, active recruiting is no longer carried out, although the self-qualification route is still open to prospective Allies. We add several new Allies to the roster every month through this route.

The Design Model and Criteria

Much discussion went into deciding how lighting quality could be defined in objective terms, and which and how many metrics should be included in that definition. There are many factors that contribute to quality lighting design, some more easily understood and accessible than others. We recognized that our prospective Program Allies would have varying technical skills and abilities, and did not want the criteria themselves to present a barrier to participation in the Program. Working with The Lighting Research Center, the following metrics were established for the program.

Color Rendering Index (CRI). Light sources differ in their ability to render the color of objects "correctly." CRI expresses the color rendering capability of a lamp on a scale of 0 to 100. For SCLP, the CRI of lamps must be 70 or higher for general use. We strongly recommend that 80 CRI lamps be used in critical applications (such as health care and specialty retail stores) where the color rendering of skin tones and merchandise is very important. Because high-CRI metal halide (MH) lamps are not available in all wattages, we accept a CRI of 65 or higher for MH lamps of 250 watts or greater in industrial and warehouse applications.

Spacing criteria. Luminaire manufacturers provide spacing criteria (SC) for specific light fixtures with direct lighting distribution on the fixture photometric/specification sheets. SC is used to calculate the maximum recommended installation spacing to obtain an even pattern of light on the surface below the light fixtures. For SCLP, luminaires must be spaced within the manufacturer's recommended SC. The distance between walls and adjacent luminaires should not exceed one-half of the luminaire spacing criteria and closer spacing is preferred. Wall-wash luminaires must be mounted no more than 3 feet from walls. Direct/indirect luminaires must be spaced based on the manufacturer's recommendations to provide uniform lighting at the workplace and uniform ceiling brightness.

Luminous intensity. This is often one of the hardest concepts for lighting contractors and distributors to grasp. A common complaint about lighting is that the fixtures are uncomfortably bright to look at or work under, or that they cause reflections in computer screens– glare. To help avoid glare, the lighting fixtures selected should not direct a lot of light toward people's eyes or onto their computers. The measure that is used to determine how much light is coming out of a lighting fixture in a particular direction is luminous intensity (LI). Luminous intensity charts for specific fixtures are generally provided in manufacturers' photometric/specification sheets. SCLP's LI criteria vary by application[3], and include those for open plan office spaces, for high-bay and low-bay lighting applications, and for other general lighting. Accent fixtures are exempt from the LI criteria.[4]

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[3] Luminous intensity criteria are specified in maximum candelas at a specific angle as specified on photometric charts. For example, luminous intensity for open plan office spaces should not exceed 300 candelas maximum at 55 degrees. This criteria was adopted by ANSI / IESNA (ANSI 2004) in Section 9.6.2.

[4] Criteria levels have been modified from time to time to reflect product availability and reception of the criteria by Program Allies. For Ally Designer Design Incentives and Multi-Site Partner Project Incentives, this luminous intensity (LI) criterion is mandatory. For Ally Contractor, Ally Distributor, and Other Ally Project Incentives, compliance with this criterion is recommended but not mandatory, although about half the projects submitted by these Allies meet all six criteria.

Mean illuminance. Recommended illuminance values–also called light level targets–are set for multiple space types based on the actual task. A detailed chart showing the targets is made available to all our Allies. Mean illuminance is based on IESNA standards.

Energy use. Energy use criteria are also provided for multiple space types and actual tasks, based on lighting power allowance (LPA). The LPA is the maximum allowed ratio of project connected lighting load and floor area, in watts per square foot. For SCLP, the required LPA is 10% lower than that allowed by the Energy Conservation and Construction Code of New York State.

Qualifying tool. Verification that projects meet all of the program design criteria is carried out using a web-based tool developed specifically for SCLP. Data concerning the characteristics of individual spaces affected (e.g., function carried out in the space, area of the space) and of the lighting fixtures employed (number and type of luminaires, spacing between fixtures and between fixtures and walls, CRI, wattage, luminous intensity) are entered into the tool, which then determines whether the project meets SCLP's design criteria. The model is often employed by Program Participants as an aid in project design, since it immediately provides guidance on where the project might be deficient. The tool is accessed through the SCLP web site (described below).

Incentive Offerings and Competition Awards

As noted above, SCLP targets the mid-market players in the lighting industry: manufacturers and their representatives, distributors, contractors, and designers. A variety of incentive offerings are offered to Program Allies to attract them to the Program and facilitate their participation. Incentive levels have been modified since SCLP's inception, and incentives have been introduced or withdrawn, in response to their reception among Program Participants. Current incentive offerings and competition awards are briefly described below.

Project incentives. These incentives are available to all Program Allies except Ally Designers (see below). Project incentives are paid to Program Allies upon submission of an application and verification that a project implemented by the Ally (or by a team of Allies) meets all of the mandatory design criteria. The three-tiered incentive ranges from $500 (for projects of less than 5,000 square feet) to $1,000 (for projects up to about 25,000 square feet).

Design incentives. These incentives are available only to Ally Designers. An incentive of $300 is paid to an Ally Designer upon submission of an application and verification that a project design meets all six of the SCLP design criteria (Phase I). If the project is subsequently built as designed (regardless of whether an SCLP Ally is involved in the construction phase), the Ally Designer is eligible for an additional $500 incentive (Phase II).

Break the ice incentive. This relatively recent addition to the slate of incentives was created to attract trained Ally Contractors to become active in the Program. Ally Contractors submitting their first qualifying project are eligible for this $300 incentive.

Demonstration project awards. SCLP actively reviews the pool of projects submitted for those deemed worthy of Demonstration Project status by their potential to promote effective, energy-efficient lighting design on a number of levels through the medium of a project case study. For lighting practitioners, SCLP Demonstration Projects show how others have used the Program's tools and resources to implement superior lighting projects for their customers in a wide range of applications. For end-users, Demonstration Projects show how others have used effective, energy-efficient lighting designs to provide significant benefits in terms of increased sales, visual interest, visual comfort, satisfaction, and productivity, while saving them money over the life of the project. Allies participating in the design and development of projects selected for Demonstration Project status receive a $1,500 award.[5]

Installation competition. This quarterly competition rewards Ally Contractors and Ally Distributors who show their involvement in SCLP with the greatest number or square footage of qualified lighting projects during each competition period. There are six competition categories each quarter, depending on the size and type of the participating Allies, with each category winner eligible for a $1,000 award.

Lighting certification. In addition to this slate of offerings, SCLP promotes The National Council on Qualifications for the Lighting Professions (NCQLP) Lighting Certification (LC) program to employees of Program Allies. A one-time $300 incentive is available to full-time employees who take the LC examination, which is administered once a year.

End-user incentives. No direct end-user incentives are available through SCLP. However, a number of complementary initiatives that incorporate end-user incentives for more energy-efficient equipment are available through the **New York Energy $mart**[SM] suite of programs. SCLP Ally incentives are based on qualifying project designs, not on the actual equipment employed. Since end-user incentives are technology-based, incentives are not paid twice for the same achievement.

Outreach and Communications

From the discussion of SCLP above, it should be evident that the Program is complex. Evolutionary initiatives have been implemented to streamline various Program elements so that they don't present a barrier to participation. However, SCLP's focus around lighting *design* rather than lighting *technology* requires regular contact and outreach with Allies to provide technical and marketing support, to maintain their interest and involvement, and to advise them of changes in the Program.

Account Managers and Technical Specialist. As part of its role as Program Administrator, ICF assigns an Account Manager to each Ally once they have enrolled in the Program. The Account Manager is the primary point of contact. Much more than a "circuit rider," the Account Managers' basic responsibility is to maintain regular proactive contact with Allies. The Account

[5] Projects considered for Demonstration Project status are evaluated on the basis of innovation, transferability and educational value, cost efficiency, promotional value, and case study value. Demonstration project case studies are available for download from the SCLP web site.

Manager helps identify qualifying project opportunities, assists Allies with SCLP incentives and application submittals, and delivers additional training on lighting design and information about how SCLP operates to Allies. The Account Managers are all lighting professionals, with years of experience in the New York lighting industry. They are technically savvy and several have the NCQLP LC certification.

The Account Managers are complemented by a Lighting Technical Specialist (also LC certified and employed by ICF International), who provides additional technical support to the Program. The Lighting Specialist assists Allies by providing design guidance and helping to identify qualifying project designs. As needed, Account Managers and/or the Technical Specialist also visit project sites with Allies (upon request) to provide design and implementation assistance. These technical resources are supplemented by the capabilities of The Lighting Research Center.

Newsletter. A two-page monthly newsletter is sent to each Ally by broadcast fax or email. The newsletter includes Program announcements and news (e.g., changes in incentives or participation requirements, announcement of competition winners), a marketing or technical tip, and "Allies in Action" blurbs, highlighting recently completed projects. The monthly newsletter is supplemented by ad hoc faxes or emails as needed; these are sometimes targeted to specific types of Allies or Allies in selected regions of New York.

Web site. The SCLP web site (www.nyserda.org/sclp) is the primary repository for all SCLP news, information, tools, and resources. Aside from Program news and announcements (as well as an archive or previous newsletters), the web site provides the following other materials for download by Allies:

- information on the Program for prospective Allies to aid in recruiting;
- detailed Program information for Allies, including an SCLP Users' Guide, incentive descriptions and application forms, and minimum project design requirements;
- Program promotional materials, such as fact sheets, a photo gallery from training sessions and award ceremonies,
- technical and design resources, such as DesignLights Consortium and Lighting Research Center case studies, National Lighting Product Information Program (NLPIP) guides and product specifier reports; and resources for specific end-user lighting applications (retail, office, and health care);
- marketing resources, such as SCLP case studies, a life cycle cost tool (to aid in project financial comparisons to conventional lighting designs);

Advanced training. As a supplement to the basic Ally training required for participation, SCLP recently developed and presented a series of training sessions covering more advanced topics in designing effective, energy-efficient lighting. These training sessions were presented during 2005 in Albany, Buffalo, and New York City. Each participant received a copy of the *Technical Guide for Effective, Energy-Efficient Lighting*, a resource developed by The Lighting Research Center. For those interested Allies not able to attend the live trainings, a web-based version of the training is available on the SCLP web site.

End-user outreach and marketing. While SCLP offers little direct end-user interaction, some Program resources are available for them. The SCLP web site has always provided a mechanism for interested end-users to locate SCLP Allies in their area–a directory of Allies allowing a search to be carried out by zip code. In addition, a separate web site page for business owners and operators provides information about SCLP and how the lighting design model employed can help their business.

More recently, SCLP initiated a pilot end-user marketing campaign in three markets (Binghamton, Syracuse, and Westchester/Rockland Counties), using **The Right Light**[SM] as a tag line. The purpose of the marketing campaign is to increase end-user awareness of the benefits of quality lighting design as they anticipate relocation or renovation projects. The marketing campaign includes a 60 second radio spot, print advertising in local media, a brochure that Allies have been sending to their customers, by-line "advertorials" and contacts with end-user organizations.

Achievements and Lessons Learned

SCLP by the Numbers

SCLP's impact can be gauged by its performance relative to the metrics that are tracked (these figures are current through May 1, 2006):

- 700 Allies companies have been enrolled, and about 1,400 Ally personnel have been trained;
- over 580 projects have been implemented or qualifying designs developed, covering over 4.2 million square feet;
- summer peak demand in New York has been reduced by more than 7 MW and New York State ratepayers have reduced energy consumption by nearly 28 GWh;
- $500,000 in incentives have been disbursed; and
- there has been significant spill-over to include projects over 25,000 square feet, which are not eligible for incentives under the Program.

Even with the high startup costs associated with educating and establishing the network of qualified lighting installers, the benefits have substantially exceeded costs. A total resource cost test of the program was conducted in 2006 for the time period starting from program inception through year-end 2005. The benefit / cost ratio was 2.5 without including non-energy impacts and 3.8 with non-energy impacts included (NYSERDA 2006).

Lessons Learned

As the first program of its type, SCLP has offered a unique learning experience. Some of the key lessons learned are outlined below.

Criteria. Over its 5 year implementation, small changes have been made to the lighting design criteria. While the types of criteria have not been altered, the metrics employed have. For instance, we increased the ceiling on project size from 10,000 to 25,000 square feet. This was done in response to both formal market research on the types of lighting projects being

implemented, and in response to feedback from SCLP Allies. Also, some of the fixture luminous intensity and lamp color rendering index requirements have been modified over time to reflect the availability of equipment (primarily HID lighting) in the marketplace and whether high color rendering is actually necessary in certain applications. Finally, for most classes of Allies, the luminous intensity criterion, which many Allies found difficult to apply, was made optional. While SCLP sets a fairly high bar for lighting quality, it is important that the design criteria themselves are not so hard to understand and implement that they present a barrier to Ally participation.

Incentive offerings. As with design criteria, we have found a need to be flexible in the incentive offerings, both in terms of the types of incentives and the amount. It is equally important to constantly monitor how incentives are received by Program stakeholders and make any mid-course adjustments as expeditiously as possible. For instance, the SCLP Project Incentive was originally a flat $500, regardless of project size. We found that many Allies did not think this amount was worthwhile to justify the additional design work or incentive paperwork. In response to this feedback, we recast it as a three-tiered incentive, with a maximum of $1,000 for the larger projects. We have also withdrawn incentives and introduced new incentives based on feedback from our Allies. A co-op advertising incentive, for instance, was withdrawn after a year when only two Allies took advantage of it. Similarly, an incentive offered to Ally Distributors to reward them for their assistance in recruiting and training of new Ally Contractors was withdrawn because of lack of interest. At the same time, we introduced a new incentive for Ally Contractors submitting their first qualified project (Break the Ice Incentive), and revamped the Installation Competition to provide a slate of quarterly instead of annual awards.

Levels of participation. As would be expected, the level of participation of SCLP Allies follows a normal distribution. We have a few outstanding Allies, who have embraced the design model, are successful at marketing the concept to their clients, and implement several qualifying project every month. We have a secondary population of Allies who are less active and less successful, but who still seem to try to make SCLP work for them and their clients. And of course we have many trained Allies who for many reasons have not been active in SCLP.[6] Since Program Allies are "self-selected," we expected a much higher degree of participation, especially since many of the Allies were required to attend training sessions (prior to the self-qualification process). With self-qualification (including a 20-question examination) now the primary route to participation, we are finding that those Allies are more truly self-selected and more active.

Sample Projects

Projects meeting the SCLP design criteria comprise nearly every commercial and institutional sector. The paragraphs below present the highlights from some recent SCLP Demonstration Project Case Studies.

[6] The other side of the coin, however, is measured in the number of Allies submitting first-time projects. During 2005, of the 160 Project Incentive applications received, nearly 10% were from Ally Contractors who had not submitted a project previously (recipients of the Break the Ice Incentive).

Retail

A sporting goods retailer in the New York City area wanted to distinguish a new store from the neighboring big box retailers. Management recognized that good lighting would attract customers while keeping operating costs in line. Shelving and other types of displays can interfere with lighting, and a challenge of general retail lighting design is to provide light on both vertical and horizontal surfaces.

The retailer engaged an SCLP Ally Contractor to create a lighting design meeting their objectives of providing an aesthetically pleasing and visually comfortable environment for staff and patrons, while minimizing energy costs. The design incorporated the selection and placement of fixtures to minimize glare, and provide the uniform light levels required. Accurate color rending was also provided, to show products most attractively. Carefully selected accent lighting was deployed for attractive portrayal of the wall displays (see Figure 1).

With a very energy-efficient design, the retailer is saving $9,000 annually in energy costs, while providing its customers with a pleasing shopping experience.

Figure 1. Clothing Colors Look Natural Under the Store's Effective Lighting

Warehouse

A manufacturer was seeking to replace existing high pressure sodium (HPS) lighting in its 15,000 square foot warehouse area with a more efficient system. The 24-foot ceiling height required a lot of "punch" from the fixture to get light down to the warehouse floor. While HPS systems are very efficient (based on lumens per Watt or lamp efficacy), they were not effective in getting the light down to the warehouse floor. There were two other challenges associated with the project: the need to minimize glare for employees working in the space; and accommodating the warehouse layout. With no pre-set rows, the warehouse lighting had to provide uniform lighting throughout the space.

The solution developed by the SCLP Ally Distributor was to install new three-lamp, T-5HO linear fluorescent high-bay fixtures. These fixtures provided the required high lumen output at a higher efficacy than the old system. They also have good glare control and produce more comfortable white light than the old HPS lamps, making it more pleasant for people working within the space. The high color rendering ability of the T-5HO lamps (85 CRI compared to only 22 CRI for HPS) ensures that colors can be more easily distinguished, making it easier to identify package labels (see Figure 2).

Compared to a typical warehouse area at 3.0 Watts per square foot, this manufacturer will save over $17,000 per year in energy costs. At the low cost of about $0.20 per square foot for materials, a quick return on investment will be realized.

Figure 2. Warehouse Area After Installation of New Lighting System

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