



INVESTING IN LED LIGHTING

More than a Penny Earned

By Ray Sjolseth



In an era of soaring education costs, investing in long-lasting energy-efficient LED lighting not only makes economic and environmental sense, but it can also improve learning.

Most of us are familiar with the old adage, “A penny saved is a penny earned.” The phrase comes from Benjamin Franklin, who wrote those words in *Poor Richard’s Almanack*. Franklin was a sensible and frugal man whose many maxims have become part of our American culture and character. Of education, Franklin wrote, “An investment in knowledge pays the best interest.” Well put.

Unfortunately, an investment in knowledge costs a pretty penny these days, and it doesn’t seem to pay as much interest as it once did. The expenses of post-secondary institutions can be daunting. According to the U.S. Department of Education’s Institute of Education Sciences, private, non-profit colleges and universities spent about \$153 billion in 2011 alone. Total expenditures for public institutions amounted to almost twice that figure (\$296 billion) in the same year.

As the costs of operating and maintaining a modern college campus continue to climb, administrators are left scrambling for new ways to cut overhead without compromising the learning experience of their students. Enter LED lighting.

A NEW LIGHTING PARADIGM FOR THE 21ST CENTURY

The invention of the light-emitting diode, or LED, has created an entirely new paradigm for general lighting applications. Long-lasting LEDs offer a highly efficient, environmentally friendly alternative to conventional lighting that significantly reduces energy and maintenance costs. For example, LEDs consume about 85 percent less energy than incandescents of the same brightness and about 40 percent less energy than



fluorescents, on average. This is good news for colleges and universities that often spend as much as 30 percent or more of their energy budgets just on lighting. Moreover, the low operating temperatures of LEDs also help to trim HVAC energy costs.

Compared to conventional lighting, LEDs last a very, very long time: 50,000 hours or more. In fact, a typical LED rarely fails like a normal incandescent or fluorescent bulb does. Like old soldiers, LEDs usually just fade away. Because of this fact, the lifetime of LEDs is defined differently. An LED reaches the end of its useful life when the total light output dims to 70 percent of its initial value or less. Otherwise, as long as the electronic components that power the LEDs continue to function, an LED lamp will continue to shine.

The unrivaled efficiency and dependability of LEDs are a powerful cost-cutting combination. The maintenance and energy savings made possible by switching to LED lighting frequently pay for the installation cost in two years or less. Such quick returns on investment (ROIs) have captured the attention of commercial, municipal and institutional managers, who can capitalize on these immediate and substantial savings by lighting large facilities or whole cities with LEDs. The city of Los Angeles, for instance, has recently completed the world's largest street-lighting retrofit project by replacing nearly 148,000 conventional streetlights with LEDs. The retrofit is now shaving 63 percent or \$7.7 million from the city's annual street-lighting bill. Add to that an estimated \$2.4 million in annual maintenance savings, and the city of Los Angeles is spending about \$10



MANUFACTURING AMERICA'S FINEST PARK EQUIPMENT SINCE 1954

From speedy bleachers to picnic tables to bike racks and more



Kay Park Recreation

It Pays to Buy Kay's - "America's Finest" Since 1954

1-800-553-2476
www.kaypark.com

million less on street-lighting each year. That's a lot of pennies "earned."

Los Angeles is not unique when it comes to embracing LED technology. Municipalities across the country and around the world have started converting to LEDs; so have hospitals, hotels, airports, military installations, high-rise office buildings, warehouses, and college campuses, of course. As LED cost and

performance continue to improve, residential applications have also begun to thrive.

INVESTING IN LED LIGHTING FOR LEARNING

Today, LED lighting products can replace virtually any conventional light fixture. In addition to LED streetlights, there are LED tube lamps, floodlights (PARs), spotlights

(MR16), down lights, household bulbs, sconces, wall washers, high-bays, bollards, and many others. They also come in a broad range of color temperatures from warm white to day white, as well as a large selection of light outputs (lumens) and wattages.

Choosing the right LED light source depends on the lighting application, and a typical college campus presents a diverse lighting environment. But as Franklin said, an investment in knowledge pays the best interest. The classrooms, lecture halls, and laboratories of every campus, therefore, should be efficiently lighted for learning.

Several scientific studies, via Berman et. al. in the mid-90s, have shown that the kind of light that LEDs emit improves visual acuity, which has a positive effect on productivity and reading accuracy. The effect has to do with the blueness of the white light that illuminates an area. The white-light LEDs used for general lighting employ a blue LED that excites a phosphor coating, which then produces a wide spectrum of colors. The resulting light looks white to our eyes. It turns out that a higher amount of blue in the white light make the pupils of our eyes contract more, which increases the acuity of our vision.

This effect, which some call "spectrally enhanced lighting," not only improves visual acuity and productivity, but it also can be exploited to lower the energy needed to light an area normally. By using bluer white light to contract our pupils, less of this light is needed to maintain the same visual acuity as before. The Department of Energy's Spectrally Enhanced Lighting (SEL) program cites this visual phenomenon as another way to save energy.

95% less water in 8 seconds



Removes 95% of a suit's water in seconds leaving them nearly drip free and helps protect facilities from water damage.

For additional information visit www.suitmate.com

SUITMATE[®]
Swimsuit Water Extractor

800-553-3353
info@suitmate.com



But, since LEDs are already so energy efficient, why not use them to create a brighter lighting environment that has been proven to enhance student learning?

GOING GREEN WITH LEDS

Another significant advantage of LEDs is the negligible impact they have on our environment. The components and materials used in the manufacture of LED lamps are recyclable or reusable; and unlike fluorescent lamps, LEDs contain no toxic mercury that can contaminate our water supplies. Furthermore, their unparalleled efficiency translates into significant reductions in greenhouse gases and a correspondingly lower carbon footprint. The LED streetlights of Los Angeles, for example, reduce carbon-dioxide emissions by an estimated 51 metric tons a year. Retrofitting just one 20,000-square-foot building, where the lights are on 12 hours a day, will cut carbon emissions by 60,000 pounds a year.

The eco-friendliness of LED lighting has not gone unnoticed by municipalities and utilities, many of which now offer generous rebates to encourage the adoption of LED lighting. Rebates shrink the cost of LED retrofits and installations even more.

Finally, LEDs are tailor-made for the sophisticated lighting-control systems that are now coming online. Lighting controls manage dimming, occupancy sensing, daylight harvesting, energy monitoring, and other critical factors, which can slash energy usage by 50 percent or more.

In short, the advent of LEDs and advanced controls has created durable, energy-efficient, eco-friendly alternatives for virtually any lighting

application. In a classroom, laboratory, or office environment, LEDs also have been shown to improve productivity and reading accuracy. For educational institutions, an investment

in LED lighting is not only an investment in knowledge; it is an investment in our future and environmental well-being.

Franklin would be proud. ✎



ABOUT THE AUTHOR: Ray Sjolseth co-founded Seesmart, Inc., a manufacturer of high-quality LED lighting products, and he has more than ten years of experience in LED lighting technology. He is currently President of Sentinel Controls and Vice President of Marketing for Revolution Lighting Technologies, Inc.



Component Sign Systems that Enhance Your Campus Image

Maximize your sign investment with our modular exterior and interior sign systems...

- Eco-Friendly LED Directional Signs offering Quick Easy-to-Read Messages and up to 90% Energy Cost Savings
- Heavy-Gauge Aluminum Post & Panel Systems for Wayfinding, Parking and Directional Signs
- Perma-Banners for Creative, Long-Life Campus Banners with Quick-n-Easy Changeable Panels
 - Interior Wayfinding, Directory and ADA Compliant Signs with options for Aluminum, Wood, Marbled Acrylic and Textured Accents

Interior Signs Feature Changeable Laser-printed Message Inserts

Call or Visit Online Today

www.isignsled.com
866-437-3040
 7625 Birkmire Drive, Fairview, PA 16415

innovative sign technologies inc.

Working to be your preferred Parking Sign Source

Proudly Made in the USA