

# Integrated Solutions Showcase: LED Lighting- Evolution to General Illumination

The Navy Yard | Building 101  
Philadelphia, PA  
12/11/12 | 8:00am – 11:45am



## Integrated Solutions Showcase Overview

- The EEB Hub Showcases examine how new lighting, HVAC, windows, façade, building control systems, and other technologies can be integrated into whole building solutions to significantly reduce building energy use.
- The showcases also explore Advanced Energy Retrofit (AER) projects, ROI and payback of energy efficient products and technologies, and other regional market engagement issues.
- These showcases are targeted to building owners, occupants, design and construction professionals, and suppliers.

**LED Panel Discussion:** Lighting industry experts participated in a panel discussion and Q&A session about LED lighting technology. Panelists included representatives from [The Lighting Practice](#), [Lutron Electronics](#), Acuity Brands [Lighting](#), and [Lighting Alternatives](#).

Generally the discussion focused on the promise of LED lighting to deliver lighting solutions and increase building energy efficiency. Alongside the positive, speakers made sure to highlight the deficiencies that LED lighting currently faces and cautioned participants to be aware of these to save their clients from facing problems in their projects.

LEDs have emerged as a viable alternative to traditional lighting (incandescent, fluorescent, CFL, and metal halide) much more rapidly than expected as opposed to experience with CFLs. Indeed, while participants have already experienced increased market demand for LEDs, improvements in design are expected to accelerate in coming years, which will reduce price, improve quality and efficiency and increase market penetration. The LEDs appeal is based on its long lifespan (50,000 hours), small size, energy efficiency and durability. However, some current products have been subject to early failures, issues with glare and compatibility with dimmer controls, and may not be more energy efficient for every given application. There is also the issue of their high initial cost, currently a premium of ~50% above the cost of fluorescent, which is continuing to improve.

What makes LEDs distinct from all other lighting options is that they operate much more like computer systems than like traditional light bulbs. LED lamps and fixtures require firmware, hardware and software to operate, while the hardware itself is much more

complex than other light bulbs. It is critical to remember that LEDs produce unidirectional output, which makes them inherently much more efficient than omnidirectional bulbs.

**Helen Demier of The Lighting Practice** discussed four case studies and the challenges posed in each, including the PA Convention Center, Williams College, University of Pennsylvania Parking Garage, and NY Marriott Marquis. The Convention center case highlighted the challenge of matching proper controls to LED lights and the premature failure of lights, especially in exterior applications. Williams College illustrated the challenges that a lack of consistent standards in describing light outputs present, especially when trying to specify a light for a retrofit application. The U Penn Parking Garage case proved that some applications yield similar energy efficiencies when replacing fluorescent lamps with LEDs, yet some clients prefer LEDs for their longer lifespans. Finally, the NY Marriot Marquis was a study in the persistent challenges in matching existing controls to new CFL and LED fixtures. Here a solution required adding an intermediary control interface to operate between the existing system and the new lighting.

**Brent Protzman of Lutron Electronics** focused his discussion on the good, bad and the ugly of LEDs. His discussion was generally academic, highlighting the potentials of LEDs to shift the mentality of the lighting industry and to reassess concepts like localized DC voltage distribution in buildings and alternatives to the standard Color Rendering Index (CRI) for gauging Light source color characteristics. One important challenge that was presented is that of ensuring timely relamping, since LED sources don't fail by going off but fade over time as apposed totaling like standard lamps. Further, Mr. Protzman suggested an industry push to optimize, with new luminaire designs, the positive attributes of LEDs instead of attempting to incorporate them into existing forms.

**Howard Lewis of Lighting Alternatives** opened up with an important note that, according to the most recent Illuminating Engineering Society progress report, over 70% of new products submitted to the IES were oriented around LEDs. He also noted the vast potential for LEDs, which are more and more adaptable and adjustable, to improve quality of life in indoor spaces.

**Sandra Stashik of Acquity Brands Lighting** also focused her discussion on the potential for LED lighting, citing important statistics about the market. LEDs are projected to make up 11% of the lighting sales in 2012. Additionally, lighting alone accounts for 25% of building energy use and many commercial buildings are still using very old, inefficient lighting, making this among the more easily attainable energy reductions in existing buildings. She also explained the important role that the Department of Energy has played in promoting LED lighting with programs such as Energy Star, Lighting Facts, and CALiPER.

- **Question: How confident can a designer be in LED controllability?**
  - As a designer, you cannot and should not assume any LED fixture to work together with any control system. Each complete system of fixture, driver and controls must be tested to ensure that they work together.

- **Question: When talking to clients, what kind of rating can be used to ensure quality?**
  - Mr. Protzman noted that the [UL Designlights™ Consortium \(DLC\)](#) is just beginning to do ratings for LEDs. A good rule of thumb recommended is to make sure that some product testing was done and make sure to hold the manufacturers to those testing results!
  
- **Is there a safety issue in using direct DC distribution?**
  - As a response to Mr. Protzman's comments suggesting that LEDs, which operate in DC, may force an industry reevaluation of using DC distribution at the local level, there was a concern about the safety of this change. Mr. Protzman noted that the real issues with DC are in transmitting DC longer distances. Voltages are typically lower in DC power. The [Emerge Alliance](#) is the lead industry group that is promoting DC for internal spaces.
  
- **How are we dealing with weatherization of outdoor chips in commercial use?**
  - Mr. Lewis noted that his company is working on the fixtures themselves to fix issues of weatherization. However, Ms. Stashik emphasized that flood lights can be an issue, as these fixtures are pointing up and she has experienced problems with water ingress.