

Starbucks LED Lighting Upgrades Case Study



Starbucks leads the way with company wide energy efficiency retrofits and investments in LED.

Project Description

Starbucks has been actively pursuing energy efficiency and conservation for years. A visit to their Energy Conservation website at <http://www.starbucks.com/responsibility/environment/energy> describes Starbucks' commitment to conserving energy and activities they have undertaken to reduce energy use in their stores.

Excellent lighting is important in retail sales; while operating cost reduction is always welcome, it is not always the primary driver in selecting lamps. As early adopters of more efficient lighting, Starbucks has occasionally experienced less than stellar performance of early versions of these products, and have continuously upgraded products as technology improves. Overall, the energy-savings benefits of lighting upgrades have been significant, encouraging Starbucks to commit to these efficient lighting sources and continue adopting new products.

Some early experiences with energy-efficient lighting include:

- In 2008, CFL reflector lamps were installed in the seating areas of stores. These lamps did not provide the warmth and brightness of the incandescent lamps they replaced.
- Halogen lamps in track lighting and recessed can lights were installed where better light quality was needed.
- GE LED PAR-style replacement lamps were installed in 2008/2009. Results were not as good as expected, with very high costs, dim light with a very bluish cast and – in spite of expected long life – many early failures. In some cases, additional fixtures were installed to provide additional light because these LED lamps were so dim.



Despite these early setbacks, Starbucks was committed to more efficient LED lighting. They worked with GE to develop improved lamps, with a warm 2700K color temperature and 83 color rendering index (CRI) to meet their needs for appearance, cost and energy efficiency. While the improved LED lamps offered better performance, high first cost was still a hurdle. To address this, the Starbucks facilities and finance divisions worked cooperatively to capitalize the cost of the lighting retrofit, based on energy savings and on the greatly reduced frequency of lamp replacements compared to the halogen lamps. Utility incentives that were included later, significantly reduced the payback period.

Results

Starbucks retrofitted the lighting in the public and non-public areas of almost all of their stores. They replaced the recessed can and track lighting in the public areas with updated LED PAR lamps – GE 61923 (Par30) and GE 61917 (Par20) – and upgrading the T-12 fluorescent lights in the back areas to T8 fluorescents.

Starbucks worked with the contractor Gexpro to ensure that the light distribution and lumen output of the new lamps compared well with the lamps being replaced. Starbucks is satisfied with the appearance of the stores under the new lighting. Basic switches are used to control the lights and some restrooms have occupancy sensors.

The original LED products' light output has significantly declined, while the improved lamps are maintaining light output.



PAR20 LED



PAR30 LED

Lessons Learned

Brad Simcox, the Global Energy & Resource Manager, offers the following advice for others who want to use LED lighting:

- Engage design teams to vet the aesthetic qualities of the lighting.
- Test lamps in the specific fixtures used in your facilities to ensure compatibility (look for evidence of overheating). Although LEDs do not radiate heat like incandescent lamps, they produce internal heat that can reduce lamp life.
- Because LED sources become dimmer over time and may never burn out, ensure that the policy and process for replacing old lamps is well established.

Additional Information

Starbucks

Brad Simcox
Starbucks Global Energy & Resource Manager
206-318-3632
bsimcox@starbucks.com

Contractor

Gexpro <http://www.gexpro.com/>

Manufacturer

General Electric

- http://genet.gelighting.com/LightProducts/Dispatcher?REQUEST=LED_PRODUCT_SPEC&productcode=61917&path=LEDs_Replacement%20Lamps_Directional_PAR_PAR20
- http://genet.gelighting.com/LightProducts/Dispatcher?REQUEST=LED_PRODUCT_SPEC&productcode=61923&path=LEDs_Replacement%20Lamps_Directional_PAR_PAR30

Considerations for Purchase

Before purchasing LED lighting:

- Understand warranty coverage and length. Coverage might include various components, field repair, shipping and labor, over 5 to 10 years. Warranty eligibility may require multiple LEDs to fail before replacement.
- Install a sample before committing to a purchase.
- Check your local utility for available incentives.
- Engage a professional to provide lighting that meets your needs, complies with energy code, and is compliant with utility incentive requirements.

Most utility incentives for LED lights use a qualified list:

- For light bulbs, look for ENERGY STAR products: http://www.energystar.gov/index.cfm?c=manuf_res.pt_lighting
- For commercial light fixtures, refer to Design Lights Consortium qualified product lists: <http://www.designlights.org>

Additional questions to ask are listed at this U.S. Department of Energy website: <http://www.eere.energy.gov/buildings/ssl/what-to-ask.html>