Successfully communicate the benefits of upgrading to LED Canopy Lighting in gas station applications

Key Best Practices

I. Highlight the main product: Fuel
   *Light the pumps clearly to attract customers!*
   *Angle recessed canopy lights toward the pumps to put them in the spotlight.*

II. People are drawn to light
   *To attract customers, light vertical surfaces such as pumps, pillars, canopy edges, and exterior store walls. This will enhance the environment giving it a safe, bright, welcoming atmosphere.*

III. Don’t leave customers in the dark
   *Use high, pole-mounted area light(s) to light the parking lot, especially near the store entrance, since LED canopy lights have sharp cutoffs.*

IV. Sell what you can deliver
   *Electricity bills matter, but savings on bills are difficult to predict, deliver, and explain. Instead, focus on the utility incentives and reductions in maintenance costs, rather than just savings.*

Gas station owners are sometimes hesitant to convert their canopy lighting from metal halides to LEDs for fear of under-lighting the fueling areas. This perceived risk is often fueled by the significant wattage reductions that are often involved in LED conversions.

To investigate these concerns, the Washington State University Energy Program surveyed 44 facilities in the region, including 26 with new LED lights. On average, LED sites measured brighter than non-LED sites. None of the LED sites appeared under-lit, and they all stood out clearly at night. All LED lights also appeared consistent in color and brightness. Some LED sites experienced a few issues that were successfully addressed at other sites, and are outlined in this Best Practices Guide.
I. Highlight the main product: Fuel

*Light the pumps clearly to attract customers!* Angle recessed canopy lights toward the pumps to put them in the spotlight.

This site lights the pumps clearly, and attracts customers with brightly lit pumps and pillars, by angling some recessed canopy lights toward the pumps, while other canopy lights point straight down. The pumps and pillars appear bright and attractive from a distance, while the recessed fixtures minimize glare.

II. People are drawn to the light

*To attract customers, light the vertical surfaces such as pumps, pillars, canopy edges, and exterior store walls.* This will enhance the environment, giving it a safe, bright, welcoming atmosphere.

This brightly colored canopy edge attracts attention without glare, complementing the recessed fixtures.
III. Don’t leave customers in the dark

Use high pole-mounted area light(s) to light the parking lot, especially near the store entrance, since LED canopy lights have sharp cutoffs.

LED lights usually have sharper cutoffs than the previously installed lights, especially when an old surface-mounted fixture is converted to a new recessed LED fixture. This can create a sharp light/dark boundary at the edge of the canopy, including a dark zone between the canopy and the store entrance, an area where good lighting is important to customers and to staff (see Figure 3). Addressing the whole property rather than only the canopy lighting will provide a better lit environment while still saving energy (see Figures 4 and 6).

Use LED area lights carefully, to minimize glare. At the poorly designed site shown in Figure 5, floodlights are mounted 6 feet high and aimed just below horizontal, blinding drivers entering the site. (See Figure 5)

Building perimeter lights (A) improve the staff’s view of customers walking near the building. The store entry faces the pumps, with a dark zone (B) between the store and the island. Due to poor visibility in zone (B), the owner wanted brighter canopy lights. However, that would make the dark zone appear even darker, because of higher contrast between the bright canopy area versus the dark zone. A higher pole-mounted light is needed, as shown in Figures 4 and 6.

Area light (A) mounted on a high pole provides ambient light beyond the canopy, to light zone (B) between the store and the pump island without glare, and to soften the boundary between the dimly lit parking lot and the brightly lit canopy area.

This flood light is mounted on a 6 foot pole, creating excessive glare because it is too low.

Area light (A) mounted on a 30 foot pole provides ambient light without glare between the island, store and parking lot (see Figure 6).
IV. Sell what you can deliver

*Electricity bills matter, but savings on bills are difficult to predict, deliver, and explain. Instead, focus on the utility incentives and reductions in maintenance costs, rather than just savings on electric bills.*

Owners had two main reasons for an LED retrofit: (1) the large utility incentive, and (2) the reduced cost and hassle of maintenance. A third benefit was their public image as modern, progressive, and saving energy to improve the environment. Many staff and some customers commented that they liked the new LED lights and felt safer with them. For canopy light LED retrofits, lighting contractors can reliably promise and deliver utility incentives, easy maintenance and bright lighting.

**The Extra Mile**

- Consider using different fixtures or distribution patterns for the edge of the island, the central island, and the site beyond the island. A mix of fixtures can produce downlight as well as aimed light on vertical surfaces.

- Address overall site lighting to maintain acceptable contrast ratios and provide good visibility for pedestrians and drivers, especially between the canopy and the pay station.

- Use products that shield occupants and approaching drivers from glare, for safety and comfort. Light diffusers, shields and other optical controls can reduce glare, while still saving energy compared to legacy equipment.

- Use products with field replaceable components and good warranties that cover the whole unit, not just the LEDs. Lighting Design Labs and Design Lights Consortium qualified product lists are a good place to find suitable lighting products.

- Light to the recommended level with the most efficient, high quality product that makes sense.

- Consider a control system to reduce energy use when occupancy is low or when full power is not needed such as dusk, dawn, or stormy days.