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Illuminating the Night with the Power of Sunshine



[1] The old parlor trick of a light bulb burning when it is clearly not “plugged in” was the precursor to modern street and area lights that are not connected to the electrical system. This is no cheap trick though; it is the evolution of LED lighting and solar power.

Companies such as Solar Outdoor Lighting, SolarPath Sun Solutions and Se’lux are producing poles outfitted with photovoltaic panels, storage batteries and dark-sky compliant LED light

fixtures. Since the power is derived from the sun, proximity to electrical power is not required, and consequently, there are no associated costs for trenching, wiring and conduit. At approximately \$21 per linear foot of trench, backfill and circuiting, the first cost savings in some cases gives immediate payback for any additional costs of solar-powered lighting.

The technology isn’t necessarily new, but as LED lamps continue to produce more light while using less power and photovoltaic panels collect more power per square inch of surface area, the concept has become more viable. Many of the same design principles for grid-tied solar panels still apply: aim panels toward the sun’s location at noon on the equinox; locate panels where they aren’t shaded by trees or buildings; keep the panels clean; and choose panels of adequate size and efficiency to collect sufficient power for the application.

There are also design parameters for the batteries. Here in Arizona we have over 300 days of sunshine each year, but that leaves just a few overcast days that would limit the intake of solar power. The batteries need to be sized to store enough power for multiple nights. Although the sunny days are typically a plus for Arizona, the ambient temperatures tend to significantly

shorten the life of batteries. The shade of the solar panel helps, of course. Project location can also be critical in regards to the short winter days having limited hours of solar radiation collection for recharging the batteries. From an engineering standpoint, the length of time that the lights need to operate must be taken into consideration when sizing the system. Motion sensor controls may be beneficial to reduce light levels when the area is unoccupied, and subsequently, reduce energy usage.

[1]LED area lights are beginning to match the light output of their metal halide and high-pressure sodium predecessors while reducing the power consumption, lengthening the life of the lamp and improving the quality of light. Not all of these are intended to be powered from a solar system, but all have the ability. Beta Lighting is at the forefront of the industry with a series of sleek designed LED lighting fixtures for pole- and wall-mounted applications. Kim Lighting has just introduced their latest version of the Warp-9 fixture with LED lamping. I can only wonder if it was a coincidence that it was released concurrently with the Star Trek motion picture!



Solar lights were initially relegated to remote locations such as parks, marinas and observation stations, so they historically haven't been aesthetically pleasing to most designers. The conglomeration of the panel, battery housing and light fixture looks like a lot of hardware on top of a pole. The lure of renewable energy, however, is making solar lighting a green initiative worth considering — and these fixtures are now finding their way into corporate parking lots and pedestrian walkways where electrical power would have been easily attainable. As the technology improves, the photovoltaic panels and battery housings may become smaller and allow the aesthetics of the fixtures to become more palatable, and eventually, solar lighting solutions may become the standard in outdoor lighting applications — unlike the antiquated light bulb trick.

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