

Implementing Solar LED Lighting for Street and Parking Lot Applications

Solar LED lighting for streets and parking lots: it's innovative, it's sustainable and it sounds like a great idea – but does it work?

By Carrie Smith of Carmanah Technologies Corp.

Going green is an initiative that nearly every industry is being forced to consider and the lighting industry is no different. The desire to incorporate new technologies to meet green initiatives is driving unprecedented change in lighting solutions and is also presenting the industry with its fair share of challenges. Technology that goes to market without proper testing, solutions that hit the mainstream before they're ready, lighting solutions that are developed without consideration for the environments in which they will be asked to perform: all of these challenges create a reasonable level of skepticism when it comes to adopting new technologies like solar LED lighting for streets and parking lots.

The skepticism that exists is deserved. Solutions that are hitting the market without the proper development, testing or engineering are failing to do the job they were implemented to perform, costing the end user time and money. Sustainability is important, but it doesn't negate the need for performance and it doesn't make budgetary considerations any less important.

So what exactly needs to be taken into consideration to ensure that solar LED illumination meets the needs of a demanding application like street and parking lot lighting?

Third Party Testing

Outside testing of LED fixtures is an important part of examining potential solar LED lighting solutions for street and parking lot applications. Third party IES files tested in accordance with IESNA LM-79 and LM-80 can help you to determine the best fixture for your application. The US Department of Energy (DOE) has a testing program for solid-state lighting that provides reliable, unbiased information on solid-state lighting technology for general illumination applications. Reviewing this information is an excellent resource for understanding the current state of the art for LED fixture design.

Choosing a fixture that has been third party tested to industry standard guidelines and can be provided with IES files will ensure you get the best combination of uniformity, light levels, anticipated life and cost. Investment in a high quality fixture now will save you time and money

in the long run: not to mention that it will provide you with immediate payback through performance that meets expectations and application demands.

Manufacturer Experience

Experience with solar LED technology plays a key role in a manufacturer's ability to develop a solution that meets the performance and environmental demands of an application like street and parking lot lighting. Key considerations include: the length of time a company has been engineering solar LED technology (look for engineering experience rather than experience acting as an integrator), the applications a company's technology has been deployed for (look for demanding applications such as traffic, marine and aviation applications that require a high level of reliability and durability to maintain safety), the number of installations a manufacturer has completed and a global installation base (look for both environmental extremes: from desert conditions to the difficult solar conditions of colder locations).

Examining a manufacturer's history will help to ensure that the lighting you are implementing for your street or parking lot is based on time-tested and field-proven technology that will perform to the standards you require.

Product Engineering

It is easy to make a solar LED light, but it is significantly more difficult to do it well. Because the performance of solar LED lighting is dependant upon an energy conversion process that takes energy from the sun and moves it through several steps to produce light, a solar LED light must be well engineered in order to function at the optimum level. Each step of the energy conversion process needs to be maximized in order to squeeze the maximum amount of power from the system. A well designed solar LED light will be engineered with each step of the process in mind and will incorporate a sophisticated energy management system (EMS) into its components. The EMS allows for intelligent lighting controls such as operating profiles and motion control that increase system performance and efficiency. An EMS also provides for a "failsafe" feature that will allow the light to dim rather than shut off completely should something happen to the system.

With careful engineering, a solar LED light can easily meet the demands of street and parking lot lighting in a relatively small form factor and can provide as much illumination as an AC powered solution.

Overall Project Cost

It is tempting to measure the cost of lighting a street or parking lot by individual system cost, and typically this is how AC powered lighting projects are budgeted. However with solar LED lighting, it is important to cost a project based on the total number of units required.

With an AC powered lighting project, all units being considered are able to provide the same amount of light: meaning the same number of units will be needed no matter what solution is chosen— not so with solar LED systems. Light output from a solar LED lighting system is entirely dependant upon how well the system has been engineered. Systems that have been carefully designed are able to provide higher light levels, meaning less systems will be needed to meet the overall light level requirements of a project. Project cost can be determined by completing a site specific lighting layout using third party IES files. By examining how many solar LED lighting systems will be needed for a given street or parking lot based on light level requirements and layout, a true picture of cost will become apparent. A system that at first may seem more expensive based on per unit cost, may actually end up being the more cost-effective solution based on overall project cost: it's important to examine this up front in order to develop a clear cost comparison.

The factors previously mentioned: third party testing, manufacturer experience and product engineering can also be considered under cost. A system that is well designed will provide a longer life, lower maintenance and better performance which translates into less cost long term.

An informed decision about the feasibility of solar LED lighting technology for your street or parking lot should always take into consideration the factors above: third-party testing, manufacturer experience, product engineering, and overall

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project cost. Solar LED technology is new and innovative and with the right considerations factored into the decision making process, it can allow for the implementation of sustainable lighting solutions that perform to the standards and expectations of the end user and fall within budgetary limitations.

For more information on solar LED lighting for streets and parking lots, please visit www.carmanah.com.

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