

# Spotlight on LED

Thanks to new commercial applications, the future of energy-efficient lighting looks bright *By Seth Warren Rose*

One of the only good things about high energy prices is the positive effect they're having on the alternative energy industry. For savvy landscapers, that positive effect could translate into new business opportunities.

With an energy-conscious public, funding for landscaping projects that take advantage of alternative energy systems is getting a whole lot easier, as the city of Liberty, N.Y. discovered when it sought to install outdoor solar-powered LED lighting in Swan Lake Park.

Swan Lake Park is one of the first public parks in the United States to specify a new class of robust, solar-powered LED streetlights for a landscape application. The economic benefits of solar-powered LED lighting were obvious to Swan Lake, but landscape contractors shouldn't over-

look solar-power lighting as a business opportunity either.

The 12-foot-tall solar-powered LED streetlights installed along the pathway at Swan Lake were supplied by SolarOne Solutions of Framingham, Mass. The fixtures employ round strings of small LEDs, providing an attractive, uniform light inside a housing that is a throwback to classic street lighting of the early 20th Century.

The fixtures are powered by photovoltaic (PV) cells that convert light energy into electrical energy. The system receives all its power from the sun. The solar panels, with drooping banners behind created by designer Amelia Amon, add a decorative touch to the pole, and offer the clearest possible message that Swan Lake Park is going green.

What sets these fixtures apart is a technology called SO-Bright that makes them far more efficient and reliable, ensuring that the lights are always on at night, regardless of cloudy days or long winter nights

Of course, solar-powered lights eliminate electricity bills, but various incentives and tax credits are available from utilities as well as from local, state and federal agencies to help fund projects. In 2007, the United States solar energy industry saw record growth as a result of rising energy prices as well as from increased federal funding for local, safe and clean alternatives. (Visit [www.eneref.org](http://www.eneref.org) for a list of various solar associations and funding sources.)

For the landscaping design, Nancy Levine of Swan Lake Renaissance con-

**Energy Stars:**  
SolarOne Solutions offers LED lighting powered by photovoltaic cells instead of electricity. And unlike conventional lights, solar-powered unit installation requires no trenching.

Photo: Hadco Lighting



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tracted Tommy LaGattuta of E&T Landscaping, who, like Levine, is a longtime resident of the town. Both Levine and E&T wanted to refine Swan Lake Park and the surrounding area, which includes a small waterfall. The landscaping began simply with flowers and hanging baskets. Though simple, the initial design won first prize and \$10,000 from the Renaissance Project which was invested back into the park, landscaping and solar-powered LED lights. Sullivan Renaissance, a beautification and community development program, oversaw the project. The co-funding for the lighting project came from the New York State Energy Research and Development Authority (NYSERDA) as part of a solar street light demonstration project.

Along the lake is a boardwalk and gazebo, neither of which was originally lit. Only the road had light posts. "It wasn't

welcoming at night, and there was also a safety factor", says Levine. "But we didn't want to put up a railing on the boardwalk because people sit on the edge and fish."

At first, Levine said they never even consider the use of solar-powered LED lights. But when she and LaGattuta saw the fixtures at a local trade fair, they were convinced. According to Levine, LaGattuta's seal of approval was the assurance she needed.

"Tommy LaGattuta said to do it, so we did it," Levine says.

LaGattuta later met with the city engineer to finalize the details, including where to place the fixtures.

Levine says the lights add beauty to the park. "The SolarOne fixtures are a very soft, beautiful light," she says. "Not glaring at all. And they light up the board walk, and all the way down to the parking lot. So it lights up the places in

the park that need to be lit up but we also designed secluded dark areas of the park."

The streetlights were easy to install and the installation preserved the land, eliminating the trenching and repaving required for underground lines of conventional streetlights. The fixtures have a decorative and contemporary design, and of course, the municipality enjoys bragging rights that come with installing environmentally friendly lights. Fossil fuel-burning power plants are responsible for two-thirds of the sulfur dioxide, a quarter of the nitrogen oxide and almost half of the human-produced carbon dioxide emissions that create smog, acid rain and global warming. Solar power, of course, burns no fossil fuels.

The town's leadership was delighted to usher in Liberty's first eco-friendly lights. "In this rapidly changing world, it

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is important for municipal government to try out new forms of energy," said Frank DeMayo, the town's supervisor. "Liberty is proud to be included in a solar lighting project, which we are confident will work to the benefit of our taxpayers, our public and the environment. This is the way of the future."

Not all solar-powered streetlights work in every situation. Superior solar lighting design mandates that the system operate through the longest night, and thereby charging its battery on the shortest day. Under these conditions, the needs of the battery are not always well matched to the power characteristics of the solar panel. Winter in the northern latitudes is the greatest challenge for solar-powered lighting.

A recently developed technology is what makes the system possible. The system, called SO-Bright Maximum Power Tracking (MPT), marries the LED light output with the solar energy input and is the electronic brain. The technol-

ogy actually captures more energy from the solar panel in winter months while providing additional run-time through sunless periods.

Unlike grid-wired LED lighting, solar-powered lighting requires more planning. A key step is estimating the how many "bad", sunless days to expect. For sunnier climates such as Southern California – the company generally recommends 5 days of battery power storage, and 10 days for cooler, cloudier regions like Toronto. And when placing solar panels, consider that the best orientation of the panels is south, but also that they can be spoiled by the shadows of trees or buildings.

According to Moneer Azzam, the company's president, the MPT algorithm essentially joins the power characteristics of the solar panels and the LED lights,

ensuring that the maximum amount of energy available from the solar panel finds its way into the battery. "This advancement in solar-powered lighting control addresses charging efficiency when and where our customers need it most," says Azzam.

Six solar-powered light posts were installed at Swan Lake Park along the pathway, which is sufficient for lighting the area at night. The average foot-candles where the lights are positioned on the walkway is 0.64. The lumens per fixture are 2400.

The Liberty community wanted fixtures that would enhance the beauty of the park and provide safety. But also, they wanted lights that were "Dark Sky" compliant. Dark sky policies prohibit lights that wash out the starry night sky. "The SolarOne lights are very directional.

**LED lights send an eco-friendly message to those enjoying Swan Lake Park's boardwalk in Liberty, N.Y. Residents say the lights also make the area safer.**

Photo: Hadco Lighting



There's no light pollution." DeMayo noted.

**Selling the idea to property owners**

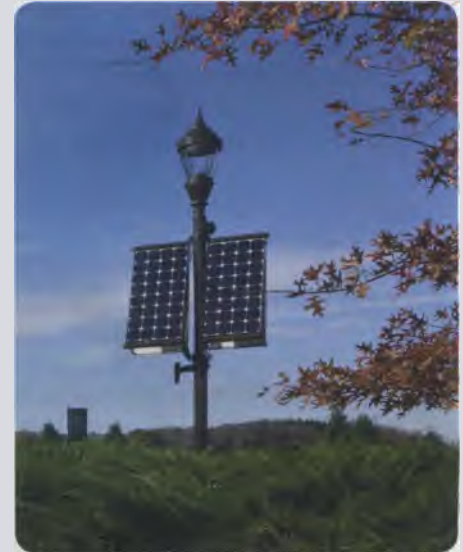
How do you sell an expensive lighting system to cost-conscious property owners? Consider this: We've arrived at the perfect storm of economics for solar-powered LED lights. Energy prices are up and eco-friendly thinking is growing in popularity. But also, the price of LEDs may begin to drop somewhat next year. Small parks and campuses may be just the right market for energy-free lighting, even in tough economic times. According to DeMayo, the new lights showcase how Liberty is not only friendly to the environment but friendly to companies that are green themselves. "We're looking to set a tone as an environmentally conscious place – to make Liberty a 'green' community. We're going to do the responsible thing."

Outdoor activities such as bicycling, camping, fishing and snow sports, generate \$730 billion in an industry that supports 6.5 million jobs across the nation and generates \$88 billion in state and national tax revenue annually.

And what could be "greener" than large green areas, such as parks, often the cheapest way to safeguard drinking water and clean the air? They absorb carbon dioxide, control erosion, clean the air of pollutants and absorb flood water.

Illuminated pathways attract pedestrians to designated walkways, making it easier to patrol areas at night and reducing accidents. With no underground cabling restraints, lamps can be positioned with great flexibility. Dark spots can be lit at night without connecting to the electrical grid, creating more usable outdoor space. LED light levels are infinitely adjustable and the white light provides greater visibility without over lighting or trespassing into the night sky.

With unprecedented energy costs, coupled with concerns about the environment, the time may be right for LED solar lighting. For Swan Lake Park, installing solar-powered LED lighting was as much about the green benefit as it was about beautifying the park. For landscapers, it's an opportunity to brighten up their business. PLD



**Because of shorter days and longer nights, New York winters can pose a challenge for solar-powered lighting.**

Photo: Hadco Lighting

Seth Warren Rose is the founder of the Eneref Group ([www.eneref.org](http://www.eneref.org)), which advances ecologically sensible facility ideas.

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