

Electrical Business

Reprint from the February 2008 Issue

Pathfinding Via Solar-Powered LEDs

Eneref Institute examines as a municipality in Liberty, New York takes a green step forward for park illumination

Swan Lake Park in Liberty, New York, is one of the first public parks in the United States to specify solar-powered LED lights for an outdoor-area application. The economic benefits of the lighting solution were obvious to Swan Lake Park, but electrical contractors shouldn't overlook the solar power business opportunity either. Solar-powered area lighting is a gateway for the electrical business community to offer a substantial new product to parks, parking facilities and college campuses for areas located far from the grid.

THE RISE OF SOLAR POWER

Solar-powered lights, of course, eliminate electricity bills. More than that, various tax credits may be available from local, provincial and federal agencies. In 2006, the United States solar energy industry saw record growth as a result of rising energy prices as well as increased federal funding for local, safe and clean alternatives.

The Solar Power 2007 tradeshow, held last September in Long Beach, Calif., saw a three-fold increase in attendees over the previous year, and sold out far in advance with more than 200 exhibitors. The show, normally targeting the business community, even attracted 3000 members of the general public.

According to the Solar Electric Power Association in Washington, D.C., "In 2007, Solar Power visitors reported that they plan to spend US\$3.9 billion with the companies that exhibited on the show floor".

BACK TO THE PARK

The solar-powered LED lights at Swan Lake were supplied by SolarOne Solutions of Framingham, MA. It manufactures solar-powered outdoor lighting systems in collaboration with dec-

orative fixture manufacturer, Hadco Lighting. The lighting system uses solar-powered panels of photovoltaic (PV) cells that convert light energy into electrical energy. What sets these lighting fixtures apart from the rest, however, is SO-Bright—the technology that makes the fixtures more efficient and reliable, ensuring that the lights are always on, regardless of cloudy, sunless days or long winter nights.

Solar-powered LED lights are part of a solar street lighting demonstration project co-funded by the New York State Energy Research and Development Authority (NYSERDA). The project is being overseen by Sullivan Renaissance, a beautification and community development program principally funded by the Gerry Foundation. "In this rapidly changing world, it is important for municipal government to try out new forms of energy," says Frank DeMayo, supervisor of the Town



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

of Liberty. “Liberty is proud to be included in a solar lighting test, which we are confident will work to the benefit of our taxpayers, our public and the environment. This is the way of the future.”

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.”

From Liberty’s point of view, the system was easy to install and preserves the land by doing away with the trenching and repaving required for underground lines. The fixtures themselves 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 sulphur 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.

HIGH-PERFORMANCE SOLAR LIGHTS

Proper solar lighting design mandates that the system operate through the longest night/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.

SolarOne, however, has developed a light that marries effective general illumination with the energy efficiencies required for applications in geographies that receive less sunlight. The SO-Bright Maximum Power Tracking (MPT) lighting controller is the electronic brain of the lighting system.

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

The MPT algorithm essentially joins the power characteristics of the two devices, 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 Moneer Azzam, SolarOne president.

Traditional outdoor HID lighting requires more energy than small solar panels can generate, which is why the solar-powered lighting system at Swan Lake Park takes advantage of new advances in light emitting diodes (LEDs). These lamps contain no mercury, glass or filaments, and produce no infrared or ultraviolet radiation. They have low energy consumption and a long service life.

Six solar-powered street lights will be installed at Swan Lake Park along the pathway, which is sufficient for lighting the area at night. According to the Hadco Lighting’s photometric report, the average footcandles where the lights are positioned on the walkway is 0.64. The lumens per fixture are 2400.

The community wanted fixtures that would enhance the beauty of the park, provide safety and be Dark Sky compliant—all of which the LED fixtures neatly achieve. They employ round strings of small LEDs, providing an attractive, uniform light. The LEDs themselves are housed inside a Hadco Lighting fixture that’s a throwback to classic streetlighting of the early 20th Century. The solar panels add a decorative touch where banners are often placed on the pole, and offer the clearest possible message that Swan Lake Park is going green.

DeMayo says he noticed the bright

white colour in a test run of the fixtures to light up Swan Lake. “We liked them in terms of the colour. We liked the white light—more halogen looking... it’s very effective.

Illuminated pathways attract pedestrians to designated walkways, making it easier to patrol areas at night and reduce 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 overlighting or trespassing into the night sky. DeMayo particularly likes that the stars are not washed out by the lights: “The lights are very directional. There is no light pollution”.

With businesses facing \$100-a-barrel oil costs coupled with concerns about the environment, the time is right for solar energy to come to the forefront. For Swan Lake Park, installing solar-powered outdoor lighting is as much about the green benefit as it is about enhancing safety. For savvy contractors, it’s a new opportunity to generate new business. ●



This article is an excerpt of the future Enerref report which assesses the impediments to building zero-energy urban communities in the US. A companion film documentary, The Enerref Project, will seek to demonstrate to key decision-makers how zero-energy communities can be commercially viable.