



Photo: Candilux GmbH

Using high-performance electronics from Phocos, Candilux GmbH installed solar lights at the soccer field and tennis court in Erbach so that children and teenagers can enjoy a well-lit and safe path home after dark.

Let there be solar light

Solar streetlights: Candilux, a manufacturer of solar-powered streetlights, and solar electronics manufacturer Phocos installed off-grid lighting at a sports field in Erbach in southern Germany. Susanne Kircher of Phocos discusses the details of the project.

There are many dark corners with no available source of light: along bike trails, crossings, or at bus stops and secluded places with no connection to the power grid. Many of these places are often frequented, yet offer little security in the dark. Solar-powered street lighting systems provide reliable lighting. What advantages do they offer? What challenges must be overcome? Are they more cost-effective than other solutions? To find out, let's take a look at one successful project – from start to finish.

In remote locations such as parking lots and paths, solar lights are shining in the truest sense of the word. At the soc-

cer field and tennis court in Dellmensingen, a district of Erbach, Germany, games are often played until late in the evening – every day during the main season. Until recently, the children and teenagers had to walk across the dark path from the club house to the residential area without any lighting. Flashlights, bicycle lights, or weak cell phone lights were the only sources of light along the few hundred meters of path.

“In the long run, however, this was no solution,” says Martin Nigst, director of engineering and maintenance for the town of Erbach. For years, parents and coaches have worried about their kids.

A source of light had to be installed to ensure the safety of the young athletes. It was not possible to run a power line through the adjacent meadows. Instead, Erbach opted for a flexible, yet cost-effective solution: solar-powered street lighting.

Planning and system design

A typical solar light consists of a solar module, a charge controller, a battery, and a DC lamp. Candilux, based in Ehingen, Germany, is specialized in the production and installation of solar-powered streetlights for standards-compliant street lighting. First, the company had to

Lighting along the path to the sports field in Dellmensingen (in November)

Amount of light required	3,300 lumens/LED lights
Period of illumination	5 pm – 12 midnight
Power required	29 W
Solar modules	crystalline cells
Lamps	P30S Candilux LED street lamps
Charge controller	Phocos CIS-MPPT
Battery	maintenance-free gel battery (alternative LiION)

determine the amount of sunlight available, including light and shade conditions, at the sports field in Dellmensingen. Next, the following questions had to be addressed: What needs to be illuminated and for how long? What light intensity is required to make sure that the area is illuminated brightly and reliably?

The system integrator installed two LED lights (Candilux CITY, model P30S-PV). With their high efficiency (29 W/3,300 lumens) and low-loss optics, the lights require minimal power, which in turn reduces system size and cost. And thanks to their intense beams and wide area of illumination, the spacing between

the lights is almost 40 meters, allowing the path to be lit by just two solar lights.

The installed control technology of the Phocos CIS-MPPT charge controller has been specifically designed for solar-powered street lighting. Besides being weatherproof, the charge controller makes sure that power storage units are provided with an even and regular charge, which ensures reliable and bright illumination especially during winter. Thanks to a wide range of settings and a day/night detection feature, customized lighting concepts can be programmed. To save energy, the lamps are only on during the evening hours, when the sports field is

Photo: Candilux GmbH



The CIS-MPPT charge controller from Phocos regulates the charging current and allows customized lighting settings. Thanks to the electrical charging unit and bright radiance of the LED lamps from Candilux, the solar lamps provide reliable light, even in the dark months of winter.

Photo: Phocos AG



A Candilux technician installs the CIS-MPPT charge controller from Phocos with the Candilux solar module. Solar lights were installed along the access road to the sports field in Dellmensingen, a district of Erbach.

used. If the battery charge starts to run low, the light does not turn off, but dims automatically. “The control technology from Phocos also offers the possibility of system monitoring and data collection for analysis and evaluation, so that the system is now configured as optimally as possible,” says Roland Sailer, the director of Candilux.

Solar vs. grid-connected lights

For the solar lighting at the path to the sports field in Dellmensingen, LED lights (29 W) with latest technology and stable steel poles of six meters height were installed.

Although the LED lights and poles were nearly four times as expensive as standard street lamps, the investment for the complete solar solution was considerably more cost-efficient than grid-connected solutions. Solar street lamps need no electrical installations (including VDE certification) and no power line

installation. Thanks to the solar solution, the city saved €20,000, which the installation of a 100 meter power line for around €200 per meter would have cost. This substantial cost saving compensates for the higher priced investments. In a comparison of costs conducted at the beginning of the investment, the solar lights proved to be five times cheaper than a grid-con-

nected system. If additional solar lighting systems had been installed, the cost savings would have been even more remarkable from the outset. According to Sailer, solar lights start saving money as soon as they are turned on.

Maintenance and service

If modifications are required, the system can be reprogrammed and adjusted. One more advantage is that the installer and LED lamp manufacturer, Candilux and the electronics manufacturer, Phocos AG, maintain a close working partnership. Thanks to their products and system expertise and experience in system design, the two German companies can offer individually tailored lighting solutions. Cities and municipalities benefit from fast and reliable service and the latest technologies on the market.

Approval

After the solar lights were installed this year in early July, parents and coaches were pleased with the result. The city was also quite satisfied with their new acquisition. “Now we have reliable lighting for the athletes,” said Nigst, the director of engineering and maintenance in Erbach. “The soccer pitch and tennis court [area] is an important part of the infrastructure,” he continued. “We are responsible for the safety of all sports enthusiasts, including safe lighting in the evening and night, which is now provided efficiently by solar-powered streetlights.” The system has also been good for the city budget. Compared to grid-connected systems, the solar solution saved a lot of money. The town is already discussing plans for four more lights along the access road, and is exploring the potential of solar solutions to light up other parts of the city. ♦

Susanne Kircher, Phocos



ADVANTAGES OF SOLAR STREETLIGHTS

- No more monthly utility bills piling up at the town hall. Cities and communities can benefit from significant cost savings over the years.
- Solar streetlights are maintenance and inspection free.
- There's no risk of electrocution from line voltage as solar lights are powered by separated extra-low voltage (SELV).
- No expensive and time-consuming power line installation. Solar lights offer total flexibility, both in placement and lighting duration and intensity. In addition to providing light and security at remote locations, solar lights can be used to light up residential and industrial areas, highways, or public spaces.
- Cities and communities play a decisive role and can inspire others with new eco-friendly and sustainable lighting concepts.