Solar powered LED Sports Lighting Solution

Some 1.6 billion people worldwide have no access to electricity and if you live on or near the equator it goes dark before 7.00pm all year round. This means that for many people darkness is key fact of life. Philips has now launched a solar powered LED floodlighting solution which will allow young people to play football at night. It harnesses the power of a free natural resource – the sun.

PHILIPS

Improving lives with Solar powered LED Sports Lighting System

Not only does darkness dramatically affect people's quality of life, it also holds countries back both socially and economically. Roads can be dangerous places and security is a constant issue. Shops close early, productivity in businesses is lower and fewer jobs are created. There are also no sporting opportunities for young people in the evenings, the effects of natural disasters and accidents are much greater than they need be and communities are literally forced apart.

World first

Philips announced the first solar-powered LED floodlighting solution in November 2009. For the first time ever, communities in both Kenya (Nairobi) and South Africa (Johannesburg) were able to enjoy games of football in the evenings. Philips' mini football floodlighting solution provides high quality white light for an area of 40 x 20 metres, which is enough to play 5-a-side football. The system, which is powered by batteries and solar panels, is completely self-sustaining.

This particular demonstration system consisted of 8 LED floodlights on four portable poles. As the quality of the light is similar to that of good quality white street-lighting, allowing visual details and colours to be distinguished comfortably, the system is also suitable for many other lighting applications such as security, markets and construction work. In fact, Philips can supply turnkey, solar-powered LED solutions on almost any scale. The scope of supply includes lights, masts, batteries and solar panels based on the customer' requirements. The main advantages of this sustainable solution are that it is affordable, uses advanced and highly reliable technology and is portable.

4 hours of strong sunlight will fully charge the batteries.

The developing world is an obvious market for this technology. However, there are also significant opportunities in the developed world in areas that are not connected to the main electricity grid.

LED's represent a technological leap

While solar-powered lighting solutions are not new, the application of this technology on a realistic scale has not been viable in the past. Philips' Fortimo LED module and LED lighting now make that possible.

LEDs are revolutionising the world of lighting. They are energy efficient, last up to 50,000 hours, require no maintenance and provide good quality light. In addition they are instant-start, shock-proof and can withstand transport in tough environments. They also run directly off low-voltage batteries, something that makes them ideal for solar lighting solutions.

The Fortimo LED module itself, which is the heart of the system, is extremely energy efficient, and has a lifetime of 50,000 hours.

The lighting can also be portable.

Setting up the lightmasts takes only a few minutes.

Football is extremely popular in Africa.

Children of the Refilwe community-project near Johannesburg, South Africa, experience night-time football for the first time.

It uses a patented remote phosphor technology, which maintains the quality of the light, to supply electricity to the floodlights, which each have a total power consumption of 25W (1800 lumens RA >70). These units are also very efficient: silver coated high reflectance optics result in an 85% light fitting efficiency.

The power behind the light

The batteries and solar panels are the other key components of the system. A full 4 hours of sunlight provides 2 evening sessions of light (4 hours each) per battery. This means that the system can be run for two evenings of four hours each before needing a recharge.
On cloudy days, the rate of recharging will be slower but the light intensity is still adequate for recharging the batteries. The batteries automatically shut down when they are 50% discharged. This feature protects the battery and extends its life by a factor of four.
The batteries are expected to have a lifetime of 5 years. The high-quality monocrystalline 80 Wp solar panels that are currently used in the system are even more long-lived with an expected lifetime of more than 20 years.

The system offers ultimate flexibility; it can be set up permanently, partially or fully dismantled after use and kept indoors, or moved from location to location. Some people may want a fixed floodlighting system, where they only need to remove the floodlights after each usage, or permanently fixed for security lighting. Others may want total flexibility and remove the floodlights after each game or event.

Villages and communities may choose to share the resource on a one-evening-per-week basis. Industrial applications, for example the construction industry, may require more limited flexibility.

Value for money

Due to the flexibility and modular nature of the system, the number of different permutations is very large. The final price will depend on the amount of light required, the number of poles/floodlights, the battery and solar power requirements and whether or not the system needs to be portable and suitable for dismantling each evening or permanently installed.

Nairobi Kenia, November 2009. The first footballmatch under Solar LED Flood Lights in Africa.

Even this system will be significantly cheaper than buying a new four-wheel drive vehicle. It will also be far cheaper than laying new power cables over a distance of more than 2 kilometres from the existing electricity grid.

Philips' partnerships

Partnerships have already been entered into with the Dutch Government (SESA project July 2008) to develop solar lighting solutions for sub-Saharan Africa and the UNEP (September 2009) to speed up the switch both to energy-efficient lighting in on-grid environments and to develop sustainable off-grid lighting solutions.

The LED Lights provide very tight light control. Johannesburg, November 2009.

Light brings communities together at night.

Nairobi, November 2009.

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Datasheet	
Application	Sports and Area lighting
Electrical supply	Solar charged. Autonomous operation in off-grid areas
Flexibility	Fully portable
Execution	Total solution including lights, batteries, solar panels, masts, robust packaging for transport, and spare parts
Football pitch size	30-40m length, 15-20m width
Lighting level	Average 15 lux, on football field 30x15m
Mast set-up	4 masts, with2 luminaires each
Luminaire	Philips LED floodlight
Light source	Philips Fortimo LED module
Light output	1800lm per LED module
Light color characteristics	Neutral white (4000K), Color rendering Ra=75
Luminaire power	30 Watt (total system power = 240W)
LED lifetime	Up to 50.000 hours
Luminaire Optics	Asymmetrical light distribution, 85% Light Output Ratio
Luminaire IP	IP65; fully dust and water protected
Materials	Aluminum housing, toughened glass cover
Battery capacity	12V-50Ah per mast (2 nights of 4 hours of light at 50% DoD)
Battery charge controls	Over-charge and deep discharge control for prolonged battery life Battery charge level indicators included
Solar panel	80Wp mono crystalline panel per mast
Expected lifetime	Battery: 5 yrs Solar panel: 20 yrs LED module: >30 yrs (lights on 4 hrs / night)
Mast height	Adjustable, up to 6 meters
Mast flexibility	Portable. Easy to set-up in less than 2 minutes with a few people
Connectors	Plug & play connection system, polarity proof
Packaging	Robust flight cases for transport in rough environments
Mounting instruction	Photos how to install (no text) included in flight cases

What is Philips offering?

Philips can supply turnkey, solar-powered LED solutions on almost any scale. The scope of supply includes lights, masts, batteries and solarpanels based on the customer' requirements. The main advantages of this sustainable solution are that it is affordable, uses advanced and highly reliable technology and is portable.

For more information email to: **offgridlightingsolutions@philips.com**
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