

# LED lights up the dark

More and more ports and terminals are investing in LED lighting, though others remain hesitant to take the plunge. **Federica Ragonese** looks at the benefits the technology offers

With a wide variety of lighting sources now available, light-emitting diode (LED) technology has established itself as one of the main choices for use in industrial facilities, as well as for domestic lighting. More and more ports and terminals have been converting to LED lighting, making investments to reap the benefits claimed for this relatively new technology.

According to Onur Kiliç, international sales manager at Turkish company EAE Lighting, the number of facilities switching from conventional to LED lighting has increased significantly over the past two years. The advantages of converting to LED, he told **CM**, include lower power consumption, easier and cheaper maintenance and a lower risk of failure, meaning that terminals are less likely to experience disruption to their operations. Additionally, he stated, the fact that conventional lighting does not always meet the latest standards for ports has pushed facilities to hasten their transition to LED.

However, despite the benefits, some port authorities are still reluctant to replace their old technology. "This is due to a number of reasons, including the high initial investment costs of LED, the fact that some people have very conservative attitudes towards new technologies and prefer to stick to old habits and false information around LED lighting technology which holds customers back from investing in it," noted Kiliç.

EAE, which provides both high-mast lighting and lighting for ship-to-shore (STS), rubber-tyred gantry (RTG) and

mobile harbour cranes (MHCs), has recently completed projects at Safiport Derince and MSC's Asyaport in Turkey and at APM Terminals (APMT)'s facilities in Rotterdam. According to Kiliç, the company's products, which are manufactured in accordance with the latest version of the IEC 60598 standards, "achieve a minimised glare with the highest efficacy lumens to watts (lm/W) values [and] include Konnex (KNX) and wireless automation systems".

He noted that having a good quality of light with the necessary lux values and a glare value that meets current standards is particularly important in port areas due to the dangerous nature of the work carried out there. "In particular, glare has a negative effect on the work of crane operators and can increase the risk of accidents," he pointed out.

Despite the many recent developments, there is always room for improvement, and the concept of the Internet of Things (IoT) is becoming increasingly important in the port lighting sector. "IoT is very important for [EAE Lighting] and it will become much more important in the near future," Kiliç told **CM**. "For this reason, our research and development (R&D) department works hard on IoT-compatible products, and we believe that in a couple of years every product in our brand will be compatible with the system."

Adam DeJong, director of transportation and infrastructure sales at the US-based Musco Lighting, pointed out that, as ports look to improve their operations and

DP World Vancouver before Musco's installation... and after.



efficiency, an increasing number of them are replacing their high-pressure sodium (HPS) and metal halide lighting equipment with LED. "The cost and performance of LED technology have improved to make it a cost-effective solution for many ports," he said.

The company's most recent product is its Total Light Control (TLC) for LED system, introduced in late 2016, which was developed to direct more light onto the target area while reducing wasted or destructive light shining into the night sky. The lighting can be directed with a high degree of precision by using custom optics over the LED light source together with luminaire reflectors.

"It's important to remember that not all LED fixtures are created the same; the LED light source has the potential for extreme cut-off, but if not properly controlled with reflectors and optics, it has a greater risk of creating glare for workers and the surrounding area," DeJong explained. "We've taken the proper steps to ensure that we can project light over long distances without negatively impacting workers or the surrounding area." These new developments, he claimed, allowed Musco to reduce glare by 99% compared with typical metal halide lighting.

According to DeJong, each TLC system can act as a full foundation for a pole-top system or for a retrofit solution. The system includes lighting, electrical and structural components designed to maximise the area illuminated around the poles, while the retrofit system includes luminaires, remote electrical enclosures, wire harnesses, cross-arms and mounting hardware designed specifically to fit existing poles. "With remote electrical enclosures, we site the electrical equipment remotely, lower on the pole, providing easy access for servicing and removing excess weight at the top of the pole," he added.

DeJong told **CM** that DP World Vancouver had chosen to replace its HPS lights with the TLC system after conducting an analysis of lighting equipment over a period of four years. The system has improved visibility at the port, has eliminated light spill onto the city's downtown area, has cut energy consumption by 58% and has eliminated the need for maintenance for a decade, he reported. Musco expects that the installation will realise a return on investment (ROI) in less than four years.

Musco's lights are equipped with the company's Control-Link control and monitoring system, which provides a network of system support and allows customers to monitor the performance of their lighting systems and to manage them remotely. "Musco's team of trained staff help customers to schedule when their systems should be operating and monitor when maintenance is needed," said DeJong. "Additionally, this system helps customers to maximise efficiency with dimming controls that are designed to complement the facility's operations."

## ROOM FOR GROWTH

According to Rene Tarapanoff, Latin America market manager at USA-based Phoenix Lighting, while more ports and terminals are becoming aware of the benefits of LED, adoption rates vary significantly from region to region. "In Latin America we still have a lot of room for growth as most ports continue to use traditional lights," he elaborated. "However, the transition has been faster in places like



EAE Lighting's Onur Kiliç

Europe and North America, as ports have been quick to take advantage of the benefits of LED."

As Tarapanoff noted, the payback time can also differ depending on where the facility is located. "While ports and terminals can usually expect payback after about two or three years, this depends also on the price of a kilowatt hour (KWh) of electricity," he noted. "For example, in some countries in Latin America it costs only eight cents per KWh, but this can go up to 30 cents in some Caribbean and African countries, leading to a much faster payback time in those countries, perhaps less than a year."

Phoenix Lighting's significant growth in the Latin American market was boosted by the launch of its EcoMod 2 LED floodlight at the end of 2016, according to Tarapanoff. He said that the company would be "adding even more to the market" with its newest product – the RTG Command Flood, a floodlight designed specifically for installation on RTG cranes. Phoenix expects it to be especially successful in Latin American and European markets.

"A port can replace a traditional 400 W halogen light for RTG cranes with a 150 W RTG Command floodlight. A conventional 1,000 W light for STS cranes can be replaced with an EcoMod 2 300 W light," he added. "Furthermore, a large number of Latin American ports operate MHCs, which can easily be upgraded to LED using EcoMod 2 floodlights. Ports that have already upgraded are realising the benefits."

Phoenix reports that the number of floodlights it has shipped to the region tripled from 2016 to 2017, and growth has continued in 2018. Recent customers in Latin America include Contecar and SPRC in Cartagena, Colombia; TPS Valparaiso in Chile; and ICARE, Contecon Manzanillo and Altamira in Mexico.

In addition to crane lighting, Phoenix provides high-mast LED lighting, which ports have requested more frequently in 2018. "Phoenix's lights for equipment have been designed to be dimmable, so the customer can easily integrate them

with their machines,” said Tarapanoff. “Similarly, with yard lighting, ports can take advantage of the remote control system to dim lights or turn them on and off.” A software program allows the lights to be scheduled, controlled and monitored whenever needed in order to further reduce energy consumption.

Brad Lurie, CEO of Georgia-based Bright Light Systems (BLS), told **CM** that the company, which initially entered the market using light-emitting plasma (LEP) as a light source, started seeing LED technology surpass plasma in terms of efficacy, efficiency and lumen output in late 2015.

“Switching from plasma was the right thing to do because, while customers were intrigued by it, they were not signing cheques to implement it,” he noted. “You can buy LED products for your home, so people are already comfortable with it as a technology and they are now trying to get comfortable with the idea of using it in their big industrial facilities too.” Lurie reported that BLS has seen growth of 300% year-on-year in 2018, adding that he expected 2019 to be another record year for the company and most likely for the industry as a whole.

However, he also noted that the adoption rate of LED lighting in US ports was still slow, mostly due to the variance in quality that characterises the lighting industry. “The early adopters picked it up very quickly, but they were turned off by this technology because they had a lot of failures, so there is a huge growing opportunity here,” he stated.

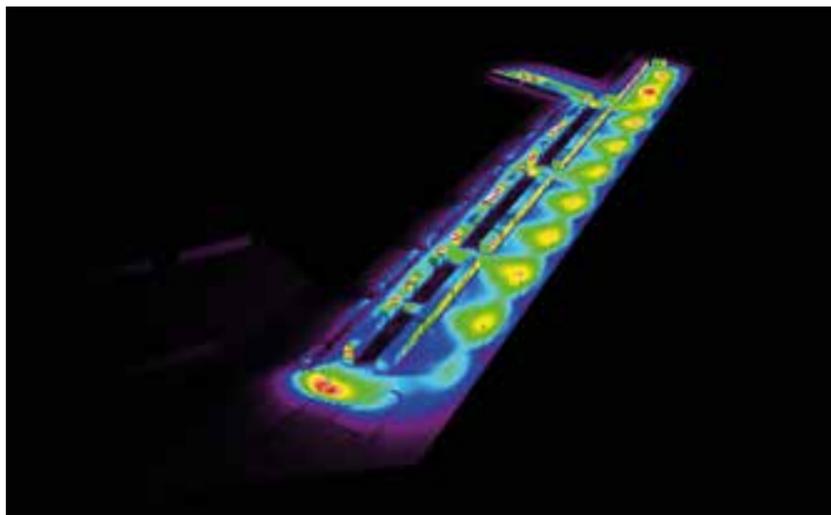
Lurie believes that the key is bringing together high-quality hardware designed for harsh environments, the prospect of safer and more secure port operations thanks to better-quality lighting, environmental benefits due to lower energy consumption and a relatively quick ROI of ideally two years. “This is what BLS is trying to do, so that customers cannot see any reason not to invest in LED technology,” he added.

The company’s most recent product is a light that offers 80,000+ lumens and more than 150 lumens per watt which, according to Lurie, gives it a competitive advantage over its rivals in terms of efficiency. Additionally, BLS’s products are designed to prevent glare and can be fully controlled wirelessly.

“Not only can we turn off or dim the lights and schedule their use based on the expected workload, but we are also measuring energy use and monitoring drivers so we can notify the customer if there is an issue,” Lurie explained. “Today we use a seven-pin connector so that the controller can be applied to our products as well as any other lights that have the industry standard twistlock to provide automation, control and asset management.”

BLS’s customers include Nassau Container Port in the Bahamas, the Georgia Ports Authority, Port Freeport in Texas and Ayala Colón Sucrs in Puerto Rico, which was one of the earlier adopters of the company’s control platform.

Moving forward, BLS is now looking at how its technology can be integrated with ports’ terminal operating systems (TOS). Lurie argued that there was a tremendous opportunity to start optimising energy consumption based on actual movements recognised by the lights’ sensors in specific areas of a facility rather than just basing



performance on calculations.

“We have been having discussions and brainstorming sessions with one of the major TOS providers for about a year now,” he disclosed. “People are starting to see that creating an application programming interface (API) between the software platforms would give ports full control. One option would be for the Bright Light Management System software package to run as an application sitting ‘under the hood’.” Lurie hopes that things will start moving in 2019, with at least a couple of trials in place.

**TECHNOLOGY OF THE FUTURE**

Tobias Neumann, managing director of UEBEX LED Lighting of Germany, believes that, the quality of lighting significantly influences port operations and LED technology can be considered the future of lighting in the port sector.

“Using LED lighting not only leads to significant energy savings, hence lower operation costs, but also permits a more uniform light distribution, which increases safety and makes workers more motivated,” he stated. “Additionally, conventional lighting has a shorter lifespan and needs to be replaced more frequently, which results in high maintenance costs; for LED lighting, UEBEX offers a five-year guarantee and long-term LED lifespan.”

↑ ↑ UEBEX manufactures both high mast and crane lighting  
 ↓ UEBEX has developed a new lighting control system

The company, which manufactures both high-mast lighting and lighting for STS and rail-mounted gantry (RMG) cranes, has several ongoing port-related projects in Europe, including the installation of lights for the production facilities at the SKF Marine shipyard in Hamburg. Neumann told **CM** that one of UEBEX’s latest developments is a special series of lights for the industrial sector that are equipped with Japanese optics, which can be controlled remotely.

“These lights, which are made of high-quality components, can all withstand high vibrations and strong wind pressure,” he explained. “We can transmit light over large distances very precisely, with a lot of light on the ground.”

According to Neumann, UEBEX is currently able to replace conventional 1,000 W lights with LED lights of around 350 W. “This is already a saving of 65% compared to the initial energy consumption, but of course work in this sense will continue and maybe in one or two years we will be able to replace 1,000 W lights with even less energy needed,” he added.

One of the company’s recent achievements has been the development of a system to control lights wirelessly from a desktop or app, which means that lights can also be dimmed at quieter times. “The system, which was enabled at the beginning of 2018, is a huge development for us and the biggest competitive advantage we have, as the lights can communicate among them and give feedback to the user,” said Neumann.

Additionally, UEBEX lights can be linked to a daylight sensor which automatically reduces power when sunlight is available. Both these capabilities make the lighting system more environmentally friendly and result in cost savings. “We are making lights ‘more intelligent’, and developing this further is our challenge for the years to come,” said Neumann.

The housings on UEBEX lights are usually made of aluminium, but the company can also produce them in magnesium on request. “This way our products are lighter, which is particularly important as high-mast poles might have a limited weight capacity,” explained Neumann. “Furthermore, this makes operations safer for drivers, as the use of less heavy lights reduces the risk of accidents, especially in the event of strong wind.”



↑ Brad Lurie, CEO of Bright Light Systems