

PHILIPS

LED lighting

DEWA power plants,
Dubai



**Bright, sustainable
future** for DEWA
power plants



“ Philips’ commitment and expertise, and the guarantees in terms of energy savings, combined with the sheer quality of work, have been vital to the success of this critical project ”

Stephane Le Gentil,
CEO, Etihad ESCO



A project of firsts

The complete lighting refurbishment and retrofit of the DEWA power stations at Jebel Ali and Al Awir represents a number of firsts: Philips, the first ESCO-certified lighting company in Dubai, partnering with Etihad ESCO for the first time, in the first retrofit of a power plant’s lighting solution.

“This isn’t like any other project,” according to Asif Khan, Operations Manager for Etihad ESCO. “We weren’t looking for a partner to just provide products. We were looking for the best guarantees that those products will continue to provide the highest levels of energy saving and lighting levels for the five year duration of this project. That’s why we chose Philips.”

Investing in Dubai’s future

This retrofit project is one of the first projects that form part of the ‘Green Economy for Sustainable Development’ initiative launched in 2012 by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, in conjunction with the Dubai Supreme Council of Energy.

Formed in 2009, the Dubai Supreme Council of Energy (DSCE) was established to drive the Dubai Integrated Energy Strategy 2030, with the aim of reducing energy demand by 30% by that date. As part of this strategy, the DSCE looked at renovating and refurbishing existing buildings to improve energy efficiency.



Asif Khan
Operations Manager, Etihad ESCO

To manage the refurbishment aspect of the strategy, Etihad ESCO was established. The first of these projects was the retrofit of the Dubai Electricity and Water Authority’s (DEWA’s) own power stations, aiming to greatly reduce energy consumption, and to make Dubai’s built environment a leading example of energy efficiency for the region and the world.

The right partner

The power plants at Jebel Ali and Al Awir provide all of the electricity for the emirate of Dubai. They are fundamental to the infrastructure of the most populous city in the UAE.

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However, the DSCE deemed these plants to be in need of refurbishment in line with Dubai's strategy to reduce energy demand and consumption. As such, Etihad ESCO was tasked with identifying the best partner to refurbish the lighting in several key areas of the power stations that make up the DEWA power plant.

“The main objective for DEWA and Etihad ESCO was to maximize energy savings,” Stephane Le Gentil explains. *“And lighting is a huge component of that.”* That's why it was vital for Etihad ESCO and DEWA to identify the absolute best partner for this project.



Stephane Le Gentil,
CEO, Etihad ESCO

At a glance

- DEWA's power stations at Jebel Ali and Al Awir, Dubai, critical infrastructures of Dubai.
- Critical, high-profile retrofit to drive energy efficiency without compromising lighting levels.
- Complex and challenging project and implementation.
- Luminaires used: GreenVision Xceed, GentleSpace Gen 2, CoreLine, Highbay, CoreLine Waterproof, Tango LED.

Result

- A variety of Philips LED lighting installed.
- A first-ever partnership for Etihad ESCO and Philips.
- Philips LED lighting resulting to 14GWh energy-savings a year, representing 68% savings in energy consumption for lighting the power stations.
- Improved light quality ensuring safety and comfort for the on-site personnel.



There were a number of criteria that were considered in selecting the best partner for this lighting project. With the highest quality products, a flawless project plan, a clear strategy for on-going measurement and energy savings verification, and a stellar reputation, Philips, the first lighting company in Dubai to be accredited as a lighting ESCO, was the clear lighting partner of choice for this project.

Ready for a refresh

The DEWA power stations were primarily fitted with conventional lighting solutions. Older LED street lights and luminaires, alongside conventional, energy-guzzling, mercury and sodium lighting meant lower light levels across the plants, and an inconsistent lux

level that fell beneath international standards.

"This lighting project required a good level of comfort in the buildings and outdoor areas, which did not exist with the current, ageing lights," Asif explains. "The right lighting level for the right period of time is extremely important."

The focus for Philips was therefore twofold: The right lighting solutions to provide comfortable lux levels while also focusing on reducing energy consumption, and developing a sustainable light solution for the plants for the long-term duration of the project. Additionally, Philips had to be able to guarantee these energy savings and lighting levels. As Asif puts it, *"Philips isn't just providing products.*



As an ESCO, it is providing expertise and guarantees that those products will maintain the right standard of comfort for the duration of the DEWA project."

Unique challenges

For Philips, the DEWA project was also a first in terms of the challenges the team faced.

The DEWA power plants provide all of the electricity for Dubai. Therefore, unlike other retrofitting and refurbishment projects, the day-to-day operations of the stations could not be disrupted in any way.

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And, of course, as these stations are critical to Dubai’s infrastructure, security & health and safety standards were both of the highest level. This required exceptional planning and careful implementation throughout the project to ensure the plant continued to provide energy to the Emirate without interruption, and that all employees and team members were able to work in a safe and secure environment.

Additionally, the weather in Dubai provides a unique challenge to such a large-scale and delicate project: “The temperature and weather in Dubai means that the equipment has to be able to work, and provide sustained performance, in this challenging environment,” says Asif. “Philips has had the right planning, right documentation and right people from the beginning. And the perfect expertise in terms of lighting. They ensured the right equipment, right products and the right advice throughout the project.”



How did Philips do it?

Philips began the project by conducting an investment grade audit to identify the exact lux levels of the older lighting, as well as reviewing the existing energy consumption of these lights against Philips' newer lighting. The team then set out a comprehensive solution, including implementation strategies, to ensure uninterrupted service for the plants, and measurement and verification guarantees for the period of five years.

Partnering closely with Etihad ESCO, Philips set out exactly the strategy and implementation plan for the LED lighting project. *"The team's knowledge and experience was a critical factor in choosing Philips for this project,"* Stephane says.

Philips then began completely refurbishing the lighting in all in-scope areas, replacing the older, conventional mercury and sodium lights with Philips GreenVision Xceed LED luminaires. These LED road lights ensured light uniformity and maximum spacing between each lamppost, as well as significantly increasing the light levels to 30 lux, in line with expected international standards. In the turbine and storage areas, 17,000 and 25,000 lum GentleSpace Gen 2 and CoreLine Highbay LED luminaires increased lighting levels to between 100 and

200 lux, and offered a consistent reduction in energy consumption, even at high ambient temperatures. Philips Tango LED floodlights were installed in other outside areas and around all fuel tank areas, which offer more than 40% energy saving compared to conventional floodlighting without compromising lighting levels in these critical areas.

In desalination and transformer areas, Philips had to ensure that any fittings would be unaffected by moisture and installed 4000 and 6000 lum CoreLine Waterproof fixtures, while CoreLine recessed lights were built into the power station offices, offering 400 lux for the lifetime of the project.



Philips guaranteed lux levels in all areas, and committed to conducting maintenance and upkeep on all new LED lighting systems over the next five years. As such, annual checks and measurements of all fixtures and lux levels are undertaken. Should any fitting not match guaranteed lighting levels, Philips will take corrective actions, and any failed luminaire will be replaced. These measurements are overseen by dedicated project management from Philips, and continuously monitored by a Certified Measurement and Verification Professional to ensure the guaranteed energy savings and lux levels throughout the course of the project.

The results

Philips committed to delivering results and, according to Stephane Le Gentil, the results are *"really quite impressive"*: Annual energy reduction of 14GWh, representing 68% savings in terms of consumption for lighting. *"Additionally,"* Stephane says, *"these energy savings mean that 6000 tons of CO₂ emissions will be avoided per year"*

The results are indicative of what Stephane calls *"a win-win partnership"*. Philips has already delivered, and continues to deliver *"significant improvements to lighting and visual comfort"* for the power stations. For Etihad ESCO and DEWA, this project

Philips as an ESCO

As of February 2015, Philips Lighting has become the first lighting company to receive an accreditation as an Energy Service Company (ESCO) in Dubai.

ESCO accreditation is awarded to a company for meeting all relevant criteria set out by Dubai's Regulatory and Supervisory Bureau (RSB), including providing sufficient evidence on the required capabilities and tools to handle ESCO projects in terms of performing energy audits, implementation of complex projects, solution design, project management and after-sales maintenance services. The company must also demonstrate financial strength, and reference projects in Dubai and worldwide.

has delivered exceptional energy savings without compromising on product or lighting quality.

For Stephane, this power plant refurbishment in Dubai with Philips won't be the last. It's an incredibly important project that, he firmly believes, *"will progress the vision of Dubai's energy saving plan"*, a plan that is being realized thanks to Philips' world-class lighting products, planning and expertise.

Energy Performance Model

An Energy Performance Model – also known as Energy Performance Contracting or Energy Service Model – is a comprehensive, flexible and modular energy service with a focus on developing and implementing energy efficiency projects in buildings or production facilities. This model shifts the focus away from selling units of final energy (e.g.: gas or electricity), and instead drives a focus on the desired outcomes and services derived from the use of the energy, such as the energy savings generated along with the amount of light on the working plain in the case of a lighting Energy Performance Model

An ESCO, such as Philips, implements a customized energy service package, including: Initial audit of the lighting infrastructure, lighting design, engineering, project management and implementation, operation

& maintenance, optimization, (co-)financing, and driving a change in user behavior. The ESCO provides guarantees for all cost and results, takes over commercial and technical implementation, and operation risks over the lifetime of the project. Additionally, the ESCO acts as coordinator and manager on behalf of the customer, and is responsible for delivering the complete, end-to-end energy service.



