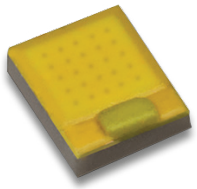
LUMILEDS

CASE STUDY



Thailand Launches Ambitious Street Lighting Project



Challenge

Replace existing high pressure sodium (HPS) lamps with LED streetlights that meet strict specifications for quality of light and reliability issued by the Bangkok government.

Solution

Forth developed and manufactured ECO-ONE and ECO-TWO fixtures for residential areas and highways — LED streetlights that consume 110W and produce the same output (11,000 lumens) as the 250W HPS lamps they replace. The LEDs used in these fixtures, LUXEON Z ES and LUXEON T/TX emitters, provide high flux and high efficacy for neutral white (5000K) illumination.

Benefits

Near-zero maintenance and improved light quality on highways. Feedback from residents indicated a feeling of improved safety due to better color rendering index (CRI>70) with LEDs relative to HPS (CRI=20).

Results

The Thailand government is saving 5 million Baht annually in maintenance cost and has determined that the streetlights will pay for themselves in 2 years.

The government of Thailand plans on replacing legacy light fixtures in Bangkok with over 400,000 LED streetlights, providing an energy savings of 70%. Forth streetlights using Lumileds high-power LEDs were chosen for the project due to their high flux, high efficacy and reliability.

A few years ago, Bangkok installed LED traffic signals throughout the city and realized the many benefits of LEDs, including long life and a rapid payback period. In 2014, the Thailand government decided that the high maintenance cost of legacy streetlights warranted an investigation into LED replacements, provided that its strict specifications for light quality and reliability could be met.

Customer Challenge

Bangkok, a city of 9 million people, installed LED traffic signals in 2003. Realizing the benefits of the traffic signals in terms of their high reliability and very low maintenance, the government was curious to see if LED streetlights also would prove to be a solid investment. Maintenance of high pressure sodium (HPS) lamps was costing 5 million Baht annually and they were replaced every 3 years. In pedestrian areas, HPS lighting was generally considered insufficient and even unsafe in some cases — another incentive to switch to LED lighting.

> "Forth streetlights with LUXEON Z ES and LUXEON T and TX LEDs met the government's specifications for light quality and reliability, while also delivering lamps with a two-year payback period."
>
> — Matinee Wandeepirom
> Director, Forth Corporation Public Company

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Solution

Following an evaluation of competing solutions and a detailed cost model analysis, the government of Thailand decided to replace 400,000 streetlights on its highways and over 10,000 residential lamps on its side streets. LED streetlights manufactured by Forth Corporation, a leading provider and manufacturer of LED light fixtures in Thailand, were deemed as ideal for this project.

Forth streetlights feature a robust overall design and a system level efficacy of 100 lm/W. The ECO-TWO streetlights utilize LUXEON T and TX emitters that are designed to achieve high efficacy (143 lm/W at 350mA, 70CRI, 5000K) at a very reasonable cost, delivering excellent color consistency, luminance, and high flux.

In the residential areas, Forth ECO-ONE streetlights were used to replace mercury vapor lamps that produced 4,000 to 6,000 lumens and consumed 100 to 125W, respectively. The ECO-ONE lamp utilizes LUXEON Z ES emitters which deliver 142 lm/W at 70CRI and 5000K when driven at 350mA, which have same footprint as LUXEON T and TX emitters, are compact and flux density in an undomed solution for optical flexibility. In outdoor applications the LEDs enable precise directionality to maximize uniformity and limit gaps in luminance between streetlights.

Benefits

Forth streetlights require near-zero maintenance and carry a 10-year warranty. On highways and in residential areas, the LED streetlights provide reliable, improve illumination relative to HPS streetlights.

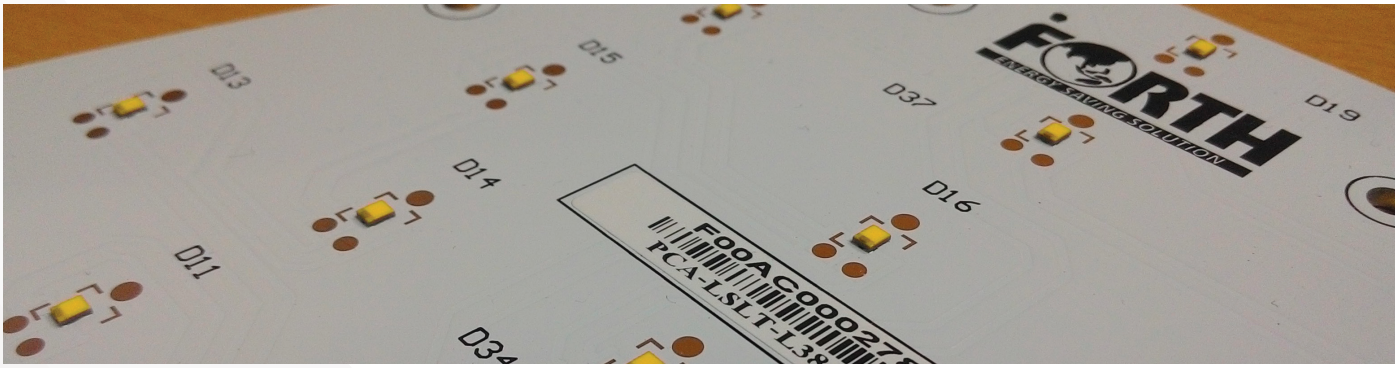
Relative to HPS, the LED streetlights enable instant start and flicker-free performance, uniformity of light and high color rendering (CRI>70), lumen maintenance of 50,000 hours (LM80), and no mercury disposal at end of life.

Results

Thailand has yet to install all 400,000 LED streetlights on its residential areas and highways, but the results to date with Forth ECO-ONE and ECO-TWO fixtures have been extremely promising. Due to the very high efficacy of the LUXEON LEDs and Forth streetlights, Thailand is able to realize a 70% reduction in energy usage. That savings, combined with an annual maintenance savings of 200 million Baht annually, means the streetlight project will pay for itself rapidly.

"Lighting of the pedestrian areas is largely motivated by safety concerns. LED lighting provides vibrant, consistent light in the designated areas."

— Matinee Wandeepirom
Director, Forth Corporation Public Company



About Forth Corporation

Forth Corp. Public Co. Ltd. engages in the manufacture and distribution of telecommunication and electronic equipment, assembly electronic parts, and project work relating to design and install telecommunication equipment. The company operates through the following businesses: Electronics Manufacturing Service, Telecommunication, Technology Related, and Retail. It also involves in the manufacture of printed circuit board and electric sign board. The company was founded by Pongchai Amatanont in 1989 and is headquartered in Bangkok, Thailand.

About Lumileds

Lumileds is the light engine leader, delivering innovation, quality, and reliability.

For 100 years, Lumileds' commitment to innovation has helped customers pioneer breakthrough products in the automotive, consumer and illumination markets.

Lumileds is shaping the future of light with our LEDs and automotive lamps, and helping our customers illuminate how people see the world around them.

To learn more about our portfolio of light engines visit lumileds.com.

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