



Challenge

To completely rejuvenate the lighting landscape of Milan by replacing 100,000 HID bulbs with LED luminaires on highways, residential roadways, and on city walkways. Cost, environmental and sustainability concerns were top priorities.

Solution

Milan installed 100,000 state-of-the-art AEC Italo 1, 2, and 2 Urban fixtures that are illuminated using LUXEON M LEDs. The high flux, high efficacy LUXEON M LEDs, together with select optics, bring the highest quality light precisely where it is needed.

Results and Benefits

Energy consumption was reduced by over 60% and Milan will save 10 million euro in energy cost (\$13 M) in its first year. The CO₂ emissions are expected to be reduced by 23,000 tons per year. The fixtures are warranted for five years and the LEDs are likely to last 100,000 hours (LM70) or 22 years, compared to 2-3 years with HID bulbs.

In Milan, Sustainable Lighting is for Life

Expo Milan 2015 was the inspiration for the largest roadway lighting project in Europe to date. Milan, Italy expects 20 million visitors for the event, which runs May through October. In preparation, 100,000 of AEC Illuminazione's fixtures with LUXEON M LEDs were installed, delivering impressive light quality, energy efficiency and environmental benefits. Milan will save 10 million euro in energy cost and emit 20,000 fewer tons of CO₂ in its first year alone.

Customer Challenge

This year, Milan, Italy is hosting some 20 million visitors from 150 countries for the world's fair, Milan Expo 2015. In keeping with the Expo's theme "Feed the Planet, Energy for Life," the city decided to undertake a complete urban renovation without parallel in Europe, such as by creating a breath-taking skyline, new cycle paths, subway tunnels and an efficient lighting system—specifically by, replacing 100,000 HID lamps with sustainable LED luminaires.

City officials set the goals for the Milan project, to become a 100% smart city using modern technologies to enhance performance and well-being, to reduce costs and resource consumption, and to engage more effectively and actively with the citizens. Naturally, energy efficiency, eco-sustainability, and reliability were key requirements for the project "Milan goes LED." Environmental considerations were also a priority, and so the project needed to be fulfilled by eco-sustainable LED luminaires. City officials also targeted a reduction in waste generation and minimization of light pollution created by the city.

The project covered highway lighting, residential roadway lighting, and lighting over city centers, squares and parks. Because of the varied requirements, fixtures of different designs with various optical capabilities were indicated.



Solution

Following the bidding and evaluation process, Milan's regional energy supplier, A2A S.p.A., awarded the lighting contract to AEC Illuminazione. Because AEC's Italo fixtures all incorporate a flexible optical design and a wide range of optics, only three fixtures were needed to address the entire project. AEC's Italo 1 and Italo 2 fixtures were used for Milan's highways and residential roadways (two sizes), while the Italo 2 Urban fixture in suspended versions addressed the needs of city centers.

AEC chose to partner with Lumileds for the outstanding performance and reliability of its LED technology. In particular, LUXEON M multi-die LEDs were chosen because of their combination of outstanding flux and efficacy at a reasonable cost. The LED light is natural, with a cool white color temperature 4000k and a minimum color rendering index of 70, which is a vast improvement over HID sources that average around 20.

In terms of upgradeability, the Italo luminaire design features immediate access to the LED PCB once the unit is opened via a tool-less latch. The LED heat sink is built into the hood of the luminaire and also acts to move water away from the fixture. Once lumen maintenance levels are met (LM-80 of 75,000 hours), the LED platform is designed for upgradeability using the existing fixture.

"Residents and visitors walking the streets of Milan are gazing at the beauty of a historic city invigorated by lighting that meets all the aesthetic, environmental and sustainability expectations of the 21st century."

— Alessandro Cini
CEO, AEC

Results and Benefits

The implementation of LED lighting on highways and in its urban areas has helped Milan become a more modern, efficient and sustainable city. The replacement of 100,000 HID lamps with Italo luminaires enabled a 51.8% reduction in energy consumption, from 144 kWhr to 55 kWh. The average energy use per lamp dropped by half, from 150W with HID sources to 75W per LED luminaire, which is expected to amount to a 10 million euro savings (\$11.3 M) in the first year alone. Beyond the energy savings, Milan officials estimate they will reduce their overall operating cost by 30% in lighting maintenance cost.

Each year, Milan is expected to dispose of 60,000 fewer HID bulbs compared to previous years, which equates to the reduction of nine tons of RAEE refuse. The city is also expected to release 23,650 fewer tons of greenhouse gases annually. AEC's Italo fixtures are warranted for five years and the LUXEON M LEDs have an expected lifetime of 100,000 hours (LM70) or 22 years with 12 hours of use per day. This sustainable LED solution trumps HID bulbs, which require replacement every 2-3 years.

Other positive benefits experienced by Milan include vastly improved safety and well being of its residents and visitors due to exceptional visibility with LED lighting. Light quality is far superior to that of its predecessors and it is delivered where and when it is needed. The new Italo luminaires by AEC have completely changed the urban landscape of the city, yet still fully comply with European and U.S. standards on light pollution. As the largest LED lighting installation in Europe to date, this project with AEC Italo series luminaires using LUXEON M LEDs signifies an important step towards more sustainable lighting in Europe—achieving energy efficiency, cost reduction and lighting performance all without compromising the beauty and charm of Milan's outdoor spaces.



"This landmark project in Milan, and others planned throughout Europe, the US and Asia, prove that we've passed the tipping point for large-scale implementation of LED streetlights. At Milan Expo 2015, millions of people will see this elegant city in a new light – one that only LED technology makes possible."

— Pierre Yves Lesaicherre
CEO, Lumileds

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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.

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