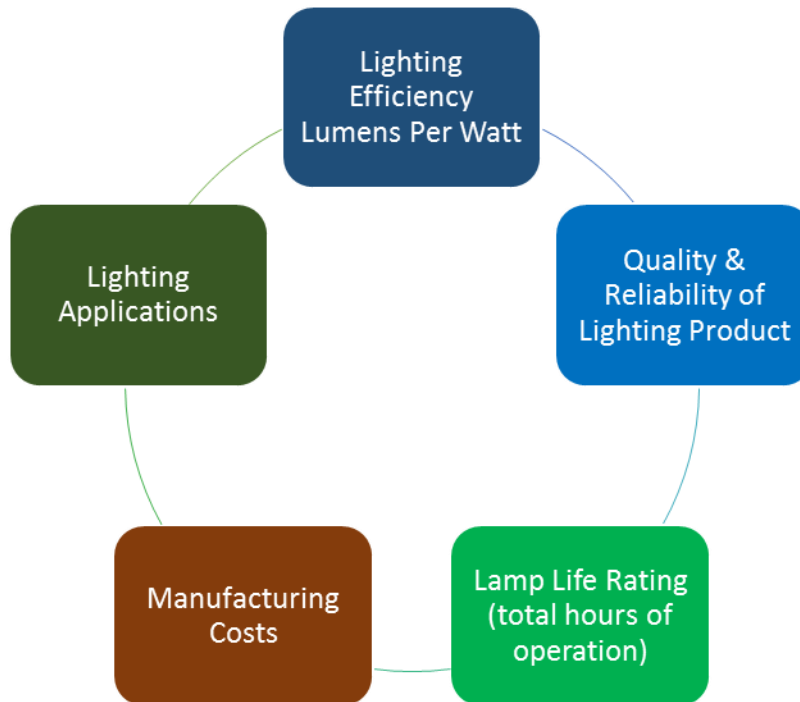


With sustained advancements in light-emitting diode (LED) lamp technology, the commercial real estate LED lighting market continues to grow at a significant pace.

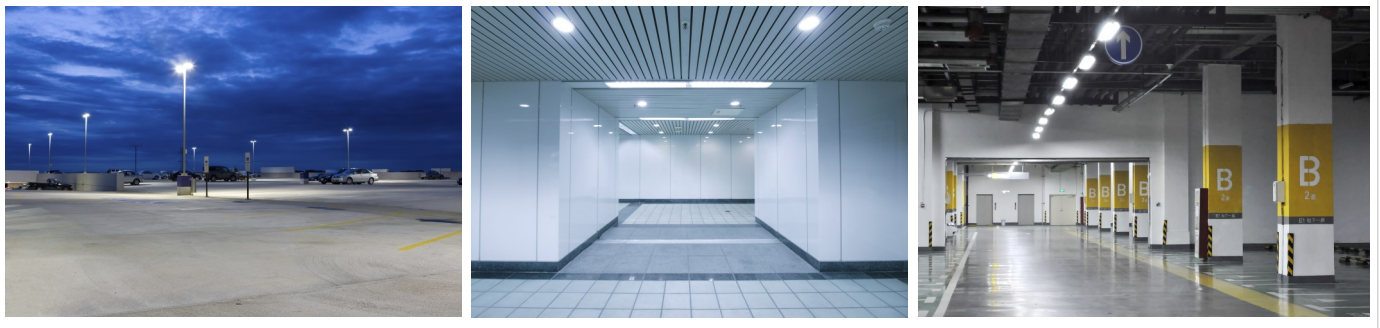


Specific advancements in the type of lighting options (applications), quality and reliability of product, electrical efficiency (lumen per watt 'efficacy'), increase in lamp lifespan rating (total hours of operation) and continued reductions in manufacturing & corresponding consumer product costs, have all led to compounded growth in the commercial real estate LED lighting market sector.

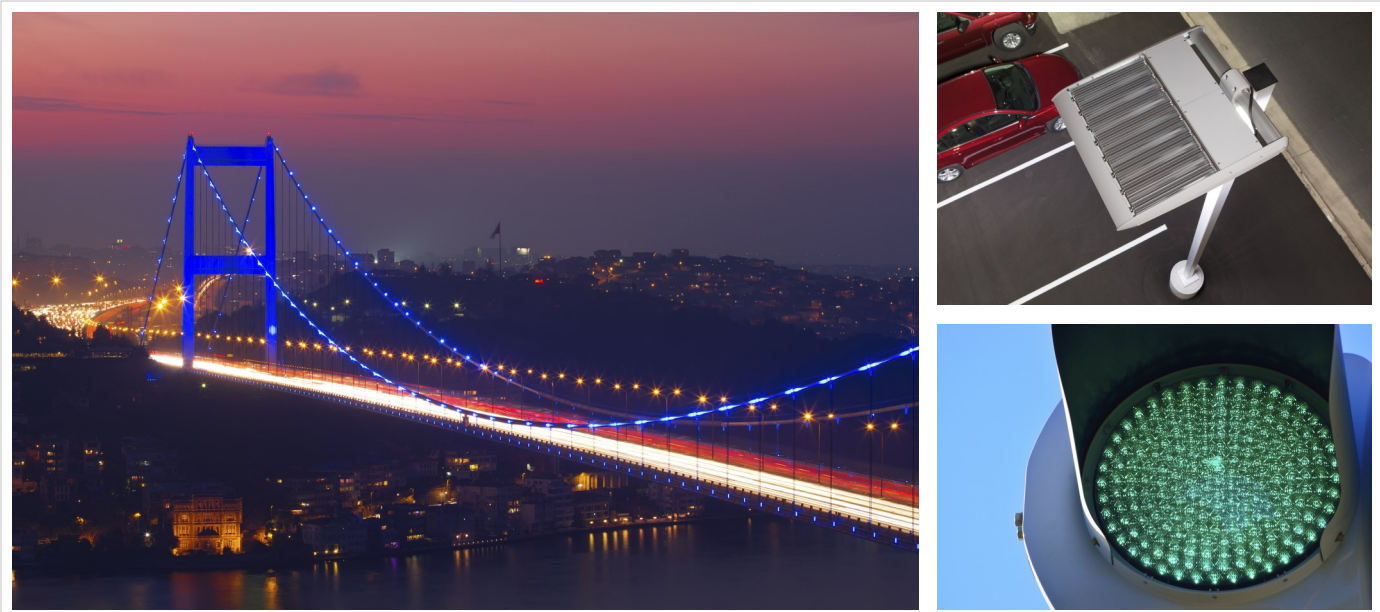


LED LIGHTING - TECHNOLOGY & COMMERCIAL REAL ESTATE SECTOR UPDATE

BuildingsOne | September 8, 2015



Over the past several years, there has been significant expansion, in the utilization of LED lighting, within the commercial real estate sector and other lighting market sectors. As it relates to the overall LED product market, the lighting applications ('luminaires') market now represents the largest component when compared to other LED products, such as 'Display LED' (signage), 'Backlight LED' (television and computer monitors) and other LED applications. In particular, there has been strong recent growth in outdoor applications, including road and surface lot lighting, parking garage lighting and other exterior luminaires applications. Continued advancements in luminaire electrical consumption efficiencies ('lumens per watt'), length of lamp life, lighting product options and cost competitiveness will lead to continued growth in the LED lighting sector. These technological advancements will result in continued reductions in commercial real estate maintenance labor and electricity costs, more favorable LED product investment payback periods and overall enhancement in property value.



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The **average life of a typical LED luminaire** (lamp) has always offered a clear advantage to alternative luminaires available in the lighting product market. The current average life, of many variations of LED lamps, considered standard in office building applications, has reached or exceeded 20,000 to 25,000 hours, with options available for extended lamp life of 45,000 hours and greater. In terms of *'life in years'*, assuming an average *'lamp use-consumption'* of 12 hours per day, 5 days per week, the typical LED lamp life is equivalent to 7 years with *extended lamp life ratings* of 14 years and longer. For commercial real estate investors, that often exceeds the typical investment property hold period!

Luminaire (lamp) Life
& Energy Efficiency



While one can imagine the labor reduction cost benefit of not having to replace lamps at a property, let's say, every 3 to 4 years, adding the advantage of electricity consumption reduction may 'tip the scales' for most property operators considering conversion to LED lighting. The 'key technical criteria', in the manager's evaluation of LED lighting energy consumption, is *'light output per unit of energy consumed'*. Lighting efficiency (or *'efficacy'*), measured in *'lumens per watt'*, has been steadily increasing since the inception of LED technology. LED light bulbs (lamps) generally produce 70 - 80 lumens per watt (or greater) compared to a compact fluorescent lamp's 60 - 70 lumens per watt or incandescent light bulb's 15 lumens per watt. LED Lighting tubes (4' - for linear light fixtures) have been designed to produce 100 lumens per watt; increasing with technology, to 200 lumens per watt.

Therefore, in order to maintain a comparable desired lighting level, during a conversion to LED technology, lamps with a lower watt rating can be utilized. By example, if converting from a 60 watt incandescent lamp application, a 12 watt fluorescent lamp or 10 watt LED lamp, could be installed. The lamp manufacturer's web-site would typically have detailed specifications, including energy rating (in watts), rated average life (in thousands of hours) and light output (in lumens or lumens per watt) for each lamp type.

With the sustained advancements in LED lighting technology, coupled with continued decreases in production costs, some sources estimate the LED lamp market will increase at a 25% compounded growth rate. This growth would result in an LED lamp market increase from \$2 billion, in the beginning of 2014, to \$14 billion by 2020.