

LED LIGHTING

A review of the current market and future developments

Hilary Graves and Cosmin Ticleanu



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- a more efficient and sustainable construction sector, with
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Cover images:

Main: LED lighting with good colour rendering for medical purposes

Top right: LEDs for automotive applications (courtesy of Osram)

Middle right: LED lamp with heat sink

Bottom right: Adjustable LED for accent lighting (courtesy of Osram)

FB 40

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EXECUTIVE SUMMARY

Lighting is an essential part of everyday life in the developed world and is one of the largest single users of energy, being responsible for between 15% and 22% of all electricity use in buildings. Good lighting is considered essential to health, well-being and productivity, but the efficiency of common light sources can vary widely.

With demands from the UK government and international agreements to reduce carbon emissions, building designers, owners and occupiers are looking at the energy efficiency of their lighting. Not since the late 1970s has there been such a focus on energy management in lighting.

Light-emitting diodes (LEDs) are a proven technology that offers enormous possibilities for providing highly energy-efficient and good-quality lighting. This BRE Trust Report summarises the current LED market and various advantages of LEDs, and outlines the challenges and barriers to widespread adoption of the technology.



(Courtesy of Switch Lighting)

1 INTRODUCTION

Lighting is an essential part of everyday life in the developed world and is one of the largest single users of energy, being responsible for between 15% and 22% of all electricity use in buildings. Good lighting is considered essential to health, well-being and productivity, but the efficiency of common light sources can vary widely.

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If LED lighting achieves its expected levels of efficiency, then with high levels of uptake the energy consumption of domestic and commercial lighting could potentially be reduced by up to 70% by 2050. It could realistically achieve a 37% saving in lighting energy use by 2030^[1].

A great deal of fundamental research and development of new components is ongoing, including development of new LED materials, especially in the green/yellow part of the spectrum, and development of all forms of OLED. The feasibility of the technology has been demonstrated, but LED products still need to be developed further before they can give energy savings comparable to those of competing types of lighting, and fully meet customer requirements for light output, colour and reliability.



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