

ENERGY CONSERVATION REQUIRES SMART LIGHTING

A worldwide consensus is evolving to reduce electrical energy consumption because of concerns about global climate change. Recognizing that lighting consumes substantial energy, the International Commission on Illumination (the CIE) at a congress held in Beijing, China 4-11 July, called for a worldwide effort to reduce energy consumed for lighting. This is possible through intelligent use of new technology and a scientific understanding of the varied human needs for different types of lighting in different settings. A more efficient use of daylight augmented with the use of more efficient lamps and the latest lighting technology now enable us to save energy without sacrificing good lighting.

Exciting new scientific findings in medical science reveal that light plays important roles in maintaining optimum regulation of biological rhythms and hormones on a daily basis. However, the improper choice of lamps or luminaires (fixtures) and poor lighting design and/ or lighting installation maintenance, can actually have negative consequences for health and also for traffic safety, personal security, worker performance and well being. To avoid this risk, the CIE has prepared a range of lighting standards and technical guidelines for the intelligent, scientifically based use of both daylight and artificial lighting.

For example, the use of high-pressure mercury lamps for roadway lighting remains widespread in many countries, but these can be replaced by alternatives that can provide better lighting at half the energy consumptions.

Also, modern electronic control systems enable us to adapt light level and timing of artificial lighting to minimize energy consumption depending upon levels of available daylight and occupancy in buildings and traffic volumes on roadways.

Consumers now have available energy-saver lamp technologies such as compact fluorescent and solid-state (LED) lamps that can often replace less efficient incandescent lamps. However, manufacturers of such lamps should continue to aim to offer good color quality, which - by taking into account the new knowledge of spectrum and health - do not produce negative effects upon health and well being. Manufacturers should also offer energy saver lamps that are readily dimmable.

Architects should further strive to design buildings which optimize daylight entrance into buildings and to follow the latest lighting standards.

All of this is particularly important because lighting consumes between 5 % and 15 % of the electricity produced in industrialized countries and up to 86 % in developing countries, or about 19% of electricity used in the world. As a consequence, CO₂ emissions currently related to the production of electricity for lighting account for 1,775 billion tonnes per year.

Good lighting brings safety, security and a better quality of life to all but needs to be related to the supply of the correct amount of light and with good colour rendering, with the minimal use of resources.