

Lighting the way

Plant engineers and facilities managers seeking ways to reduce costs and improve efficiencies often overlook lighting systems. Brian Wall examines some of the options

With soaring energy bills, taking an informed approach to facility lighting and its control is more important than ever. Not only could engineers and managers achieve energy and maintenance cost savings and help to reduce site CO₂ emissions, but they could also improve safety, security and employee comfort.

Engineers and managers should consider the advantages of modern control technologies, as well as new lighting systems, if they want to deliver appropriate lighting in the most energy-efficient manner possible. Quite simply, they're not reaping the full potential of efficient lighting systems, if they remain switched on when they're not required.

On top of that, there is the natural versus artificial light issue. "Those in charge of a building should ask themselves if they are making the most of harvesting and controlling access to what is a 'free' commodity – natural daylight," argues Peter Haseler, from Siemens Building Technologies. "Every time a light is turned on, it generates a cost. By applying a level of automated lighting control to the fabric of a building and adopting an intelligence-led approach, plant managers can really begin to maximise use of both natural and artificial light."

Making a plant or building 'think for itself', in conjunction with its natural environment, is the way forward, he insists. "Digital Addressable Lighting Interface [DALI] is the most flexible way of controlling lighting running gear to deliver the precise amount of light at all times throughout the day," he says.

So what might be realistic savings? "It is generally accepted that, in a typical building, the total level of electrical energy consumed that can be attributed to lighting is around 28%. So, for a typical annual energy bill of £1 million, lighting therefore accounts for some £280,000," says Haseler. Making inroads to cutting that is about multiple approaches. "For example, installing a digital ballast control gear system – such as Siemens' Gamma that complies with the KNX 'open' control system for building controls – ensures that areas are only illuminate when they are occupied," he suggests.

Indeed, taking an holistic approach to lighting controls can generate energy reductions of up to 44%, estimates Haseler. "In money terms, this equates to a £120,000 saving in the energy bill, based on an annual £1 million electrical energy spend, meaning a capital payback period

amounting to approximately two years."

So how might you start? To achieve optimum energy savings, any lighting system must be matched to activities in the building, observes managing director of Lutterworth Ecolighting, Martin Needham. "In an industrial environment, where there can be fluctuating levels of activity in different areas during the day, this becomes all the more important."

Matching activity levels

For him, best results are achieved when design teams understand the practical application of the lighting. "This means identifying when lighting is needed, for how long and if there are any areas that require particular attention, such as walkways or workstations," he explains.

That said, traditional sodium lighting or metal halide discharge light fittings typically consume 450–460W, whereas Ecolite fittings can consume anywhere between 76W and 252W, depending on the fitting type, even at full power. And these devices produce a crisp white light.

"The fittings have built-in sensors to detect motion and monitor ambient daylight levels," adds Needham. "When there is no occupancy in an area, or when there is sufficient ambient daylight, the lights automatically switch off or operate at 10%. We can programme timers so that, when the sensors detect movement, the lights in that zone can remain on for a period lasting any time from 10 seconds up to 72 hours." 

Below: Martin Needham, from Lutterworth Ecolighting
Bottom: Siemens' Peter Haseler



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