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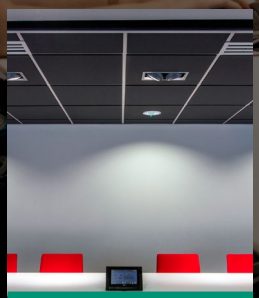
Introducing Your New Operational Manager

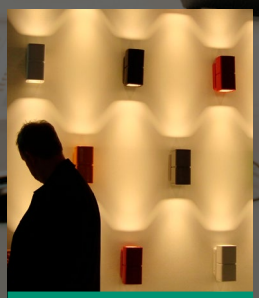
Laying the foundation for a healthier, more productive built environment

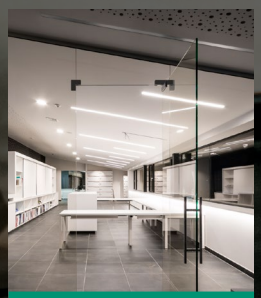
The built environment is well established as playing a critical role in employee productivity, health and well-being. As well as offering crucial opportunities to improve workforce wellness, there is another important opportunity in the office too. As one of a business' most valuable assets, the built environment itself can be used in an increasing number of ways to contribute towards profitability and performance.

In this eBook, we discuss ways in which the modern office can be put to work. How it can be connected to both broader business drivers and the people within it. How it can empower employee productivity through improved ambience and intelligent uses of space. How lighting can become a contributor, rather than a cost. How the office can be operationalised to benefit the business.

This eBook discusses new ways to consider the built environment, to sweat a business' most valuable asset, the WELL Building Standard and practical implications that can be taken from it, how to apply Smart most effectively in the office environment, and finally, some best practice examples of the office working for the business, in the context of lighting.







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What's Your Office Done for You?

Legislating for high performance

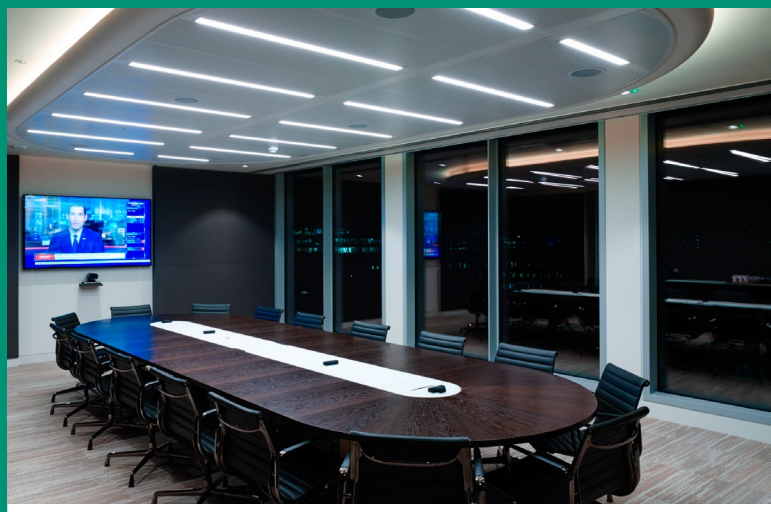
The modern office is a complex and variable asset. Or at least it should be. The built environment can do more than ever, but few office environments truly put it to work. High performance buildings are becoming increasingly mainstream and sought after thanks to a couple of high profile initiatives. At the same time, increasingly complex legislation is bringing even low performing buildings up to scratch.

Regulations may differ by region, but these high profile initiatives have a number of similar narratives, all contributing to a broader conversation around the need for buildings that do more – for both the business and for employees.

'Lighting, Well-being and Performance at Work' found that 'companies should consider the need to invest in workplace lighting as a means to develop work environments that support well-being and performance, and reduce the likelihood of employee stress, absenteeism, and industrial accidents.'

High performance buildings are a hot topic. Smart technologies are opening up opportunities for previously 'dumb' components to elicit, store and analyse business data. The insights gathered can inform both real time and strategic decision making to help office managers, facilities managers and board members make more effective choices about the built environment.

Even older buildings are being brought up to scratch. For example, with the introduction of the Minimum Energy Efficiency Standard (MEES) in the UK, a minimum energy efficiency rating of 'E' is now required before a building can be rented out.



Using occupancy sensors to dim or switch off lighting when a room is unoccupied can reduce electricity use by

30%

The 2010 Energy Performance of Buildings Directive and the 2012 Energy Efficiency Directive are the EU's main legislation promoting the improvement of the energy performance of buildings within the EU. The EU has already adopted a number of measures to improve energy efficiency in Europe, including mandatory energy efficiency certificates accompanying the sale and rental of buildings, large companies are also required to conduct energy audits at least every four years.

These standards should not be seen as a hindrance or inconvenience to landlords or businesses, quite the opposite. They should be seen as an opportunity to revisit office planning, to find efficiencies and cost savings, to optimise the business. With lighting representing one of a business' main energy costs, there are real savings to be made.

According to the Carbon Trust, using occupancy sensors to dim or switch off lighting when a room is unoccupied can reduce electricity use by 30%. Daylight sensors that enable adjustment of artificial lighting in a room, according to the amount of natural lighting coming in can reduce electricity use by up to 40%.

Within these wider business benefits, employees themselves are increasingly cognisant of the role that lighting can play in their own well-being, and are increasingly likely to make requests to improve their environment – requests that must often be acted on to comply with Health and Safety legislation.

With employee awareness and expectations for comfortable and healthy places to live and work growing, lighting has a key role to play in both green field developments and in retrofitting older buildings to comply with new standards.

Using occupancy sensors to dim or switch off lighting when a room is unoccupied can reduce electricity use by 30%

The potential in your office

About 35% of the EU's buildings are over 50 years old and almost 75% of building stock is energy inefficient

38% of the total speculative office space being delivered in UK regional cities between 2017 and 2020 will be in the form of refurbishment

19% of world electricity demand goes to lighting

Lighting, cooling and ventilation are responsible for more than 60% of electricity use by office buildings

68% of employees complain about the lighting situation in their offices

In Europe, buildings are responsible for 40% of energy consumption and nearly 36% of CO_2 emissions

Using occupancy sensors can reduce electricity use by 30%

Daylight sensors can reduce electricity use by up to 40%

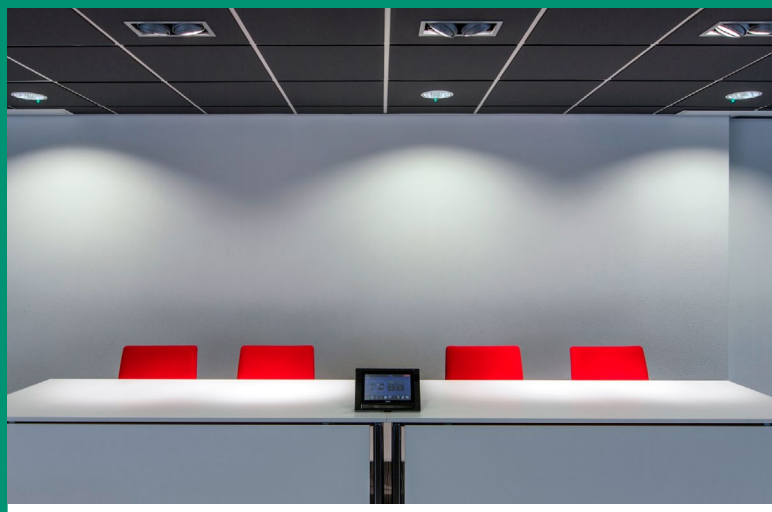
Are You Well?

As well as increasingly stringent standards coming into force, other initiatives are exploring the role of the built environment in employee well-being. The WELL Building standard and Buildings 2030 are big in Europe, highlighting the need to create a better, healthier, more productive environment.

The WELL Building Standard

Having already made waves in the US, 2018 is expected to be the year the WELL Building Standard goes big in Europe. WELL explores how 'design, operations and behaviours within the places where we live, work, learn and play can be optimised to advance human health and well-being.' It comprises over 100 features outlined over eight concepts, with 13 related to light alone. These features should be considered in a truly high performance building that puts its employees first.

The lighting related features range from the very specific – such as colour quality – to the more generic, such as guidelines that minimise disruption to the body's circadian system. WELL highlights the influence light has on the body in areas other than vision, impacting the circadian rhythm and subsequently, a number of physiological processes – including those related to alertness, digestion and sleep. The institute emphasises that all light – not just sunlight – impacts these processes and insufficient or improper lighting can impact employee well being.



The WELL Building standard and Buildings 2030 are big in Europe, highlighting the need to create a better, healthier, more productive environment

Buildings 2030

The WELL Building Initiative is not alone in its drive towards high performance buildings. Buildings 2030 is a European initiative, supported by the European Climate Foundation, aiming to 'mainstream the demand for high performing buildings in Europe by seeking public and private sector commitments to invest in better indoor environments by 2030', citing 'people's health, wellbeing and productivity' as a core priority. Buildings 2030 raises the issue of the sheer amount of time we spend indoors – citing that we spend 90% of our time in buildings. Given this standout statistic, the initiative aims to 'mainstream the demand for high performing buildings in Europe by seeking public and private sector commitments to invest in better indoor environments by 2030'. Buildings 2030 raises issues close to the heart of this eBook: that people's health, wellbeing and productivity must be prioritised alongside building performance.

People's health, well-being and productivity

Common issues with office lighting

Dim lighting can cause a number of health issues, such as eye strain and headaches, and the associated drops in productivity. Overly harsh lighting can cause eye strain and even trigger migraines. Getting the balance right means taking a considered approach to fixtures, fittings and lamps, before even starting to think about the opportunities that Smart technologies add.

Office work can be particularly demanding on the eyes – especially when employees are required to stare at screens all day. Artificial light from badly specified or fitted luminaires can have ill effects on screen displays, causing a number of visual complaints.

However, the health impacts of poor illumination are not limited to just the ophthalmic. Employees straining to read in poor light can suffer musculoskeletal issues thanks to compromised posture.

Given that illness costs European businesses an estimated £77 billion a year, the benefits of improving lighting for the wellbeing of employees cannot be overstated – for the health and wellness employees themselves, and for the business.

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Putting the Built Environment to Work

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As well as the clear benefits good quality lighting can have for employees, the office can do more for the business too. Make lighting a contributor rather than a cost: lower infrastructure costs and get more out of the space available in one of the business' most valuable assets.

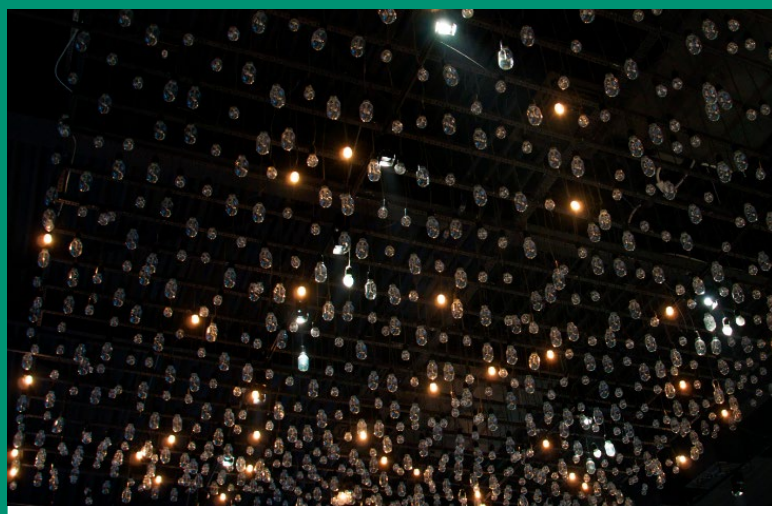
The applications for Smart lighting within the office are considerable and will only grow with the increasing sophistication of technologies. A renewed approach to the built environment will help facilities managers find brighter opportunities to meet and exceed compliance, improve productivity and employee experience, and reduce costs on multiple levels.

Taking the leap to LED

Before exploring the benefits of smart technologies and their applications, there are a surprising number of businesses that have not yet made the switch to LED. The positive effects of LED lighting on mood and performance are undisputed.

As well as health and well-being, LED lighting has a significant impact on the bottom line. LEDs consume less than 80% of the electricity of incandescent bulbs, so the potential operational expenditure (OPEX) benefits are clear.

LED lighting has long been acknowledged as the optimum solution for lowering energy usage. However, it must be well controlled in order to maximise energy saving potential.



LEDs consume less than

80%

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Taking control

We control other utilities every day to save money and work more efficiently, why should lighting be any different? Highly intelligent, decentralised lighting control systems enable businesses to adapt lighting controls and achieve significant energy savings through more granular control.

Take a moment to look around your office during the day. How many lights are on at full intensity above empty desks? How much light gets wasted in those corridors and rooms that have extremely low footfall?

New technologies are available that continuously detect human presence and natural light levels, enabling continuous zonal adjustment. Busy areas such as foyers and corridors will stay bright and well lit, whereas quieter areas like meeting rooms and lesser used corners of the office will automatically dim gradually over time to save energy.

This level of advanced lighting control can save businesses up to 87%, achieving the highest possible energy saving and helping you to achieve your green building certificates, such as BREEAM.

Advanced lighting control can save businesses up to

87%

Harvesting big data

Data is currency. Gathering data on building activity and performance can generate insights to inform both operational and long term decision making, and lighting is the best place to start. Lighting is the backbone of the connected office. Already ubiquitous, and with a power source installed, it is the perfect component of the built environment to link and manage disparate Smart components.

From there, application opportunities are only limited by a facility manager's imagination – and most likely, budget. Sensors and detectors can be easily and cheaply integrated and powered, to gather new data on area use and provide new value.

For office and facilities managers, big data offers increased efficiency modelling. By understanding peak and off peak times for individual parts of the office or estate, they can better manage energy usage through more accurate deployment of systems such as HVAC.

Improved productivity: better quality of light

The quality of office lighting influences behaviour and productivity. As well as allowing as much natural light in as possible, cooler temperature lighting keeps people focused. Warmer temperatures are associated with more relaxing environments, so could be well applied in communal break areas, for example. Either way, LEDs remove the harsh glare associated with incandescent and should be considered an important first step in improving quality of light, if they are not already installed.

Reduced maintenance: intelligent switch-on

By using space more intelligently and reducing usage accordingly, maintenance demands on lighting systems reduce in turn. The installation of LEDs will drive maintenance requirements down, given their long, reliable lifetimes. Couple LEDs with centralised, self-testing systems and the operational benefits become clear, as the resource burden on operational staff reduces. The most obvious place to apply this thinking lies within emergency lighting.

Improved insight: better use of space

The applications of occupancy detection are many and varied. From minimising cleaning requirements by informing cleaning staff about which rooms have been used in a given day, to delivering employees to the correct floor in the lift, depending on the space available, to optimising the purchase of office equipment and positioning it appropriately. There are also implications for security. If facilities management have a better insight into frequently used areas, they can close down unused space and negate the need for security to monitor activity in that area. HVAC systems are the obvious and most commonly cited application area for occupancy detection, joining lighting as one of a business' biggest energy expenses.

Improved efficiency: driving down operational costs

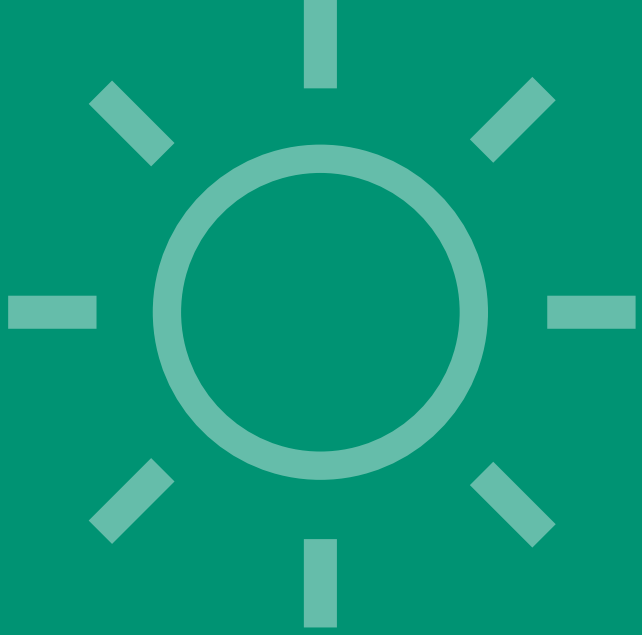
All of these Smart solutions ideally lead to one ultimate conclusion: cost savings. The operational benefits elicited by one or a combination of these Smart systems could be considerable: and that really is putting the built environment to work.

Enabling technologies for a Smarter space

As technologies become more sophisticated, so too do their potential applications. There are a number of Smart, enabling technologies emerging.

Li-Fi makes traditional Wi-Fi seem positively sluggish and is operated through the lighting

Making traditional Wi-Fi seem positively sluggish, and operated through the lighting. Li-Fi is still a long way from being used commercially, but by way of illustration, using a 224Gbps speed would technically allow for 18 movies of 1.5GB each to be downloaded in a single second. In an office setting, speeds up to 100 times faster than average Wi-Fi speeds were achievable. As well as speeding up connectivity, Li-Fi has impressive implications for energy efficiency, running through LED lights, which require so little energy. One of the most commonly cited drawbacks of Li-Fi – the fact that it cannot transmit through walls, could also be seen as a positive: making transmissions more secure. As more 'things' become added to the IoT, Li-Fi looks set to play a vital role in providing the infrastructure required to handle such volumes of data.



Localised lighting > task lighting

Casting light on never-used corners is inefficient and impacts the bottom line. Localised lighting, according to known uses of space, can significantly reduce costs and prove to be more efficient than task lighting, which essentially doubles illuminance on a specific area.

Power over Ethernet (PoE)

Using an Ethernet cable to power luminaires, and transmit data between the light fixture and control software means that only one cable is required to power and control fixtures attached to the network. Each individual fixture is given a unique address, so commands and changes can be programmed without the need for updates to hardware.

Bluetooth mesh

Bluetooth mesh allows many-to-many communication over Bluetooth. Its open standards and daisy chain connectivity enable the creation of large-scale device networks, so it's ideally suited to IoT solutions, where multiple devices must reliably communicate. The mesh topology means that enabled light fittings do not need to be in range of the initial device. Like Li-Fi, Bluetooth mesh doesn't require a large amount of power, but it is capable of connecting thousands of devices.

5G

5G technology will allow the movement of data at much higher speeds than today's 4G networks. Critically, though, 5G will do so at much lower latency, meaning a lot less lag – at rates undetectable to a user.

Clearly, exciting times lie ahead. The office of the future is looking extremely well-connected, and lighting technologies look set to be a key enabler.

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A Roadmap to Work and Wellness

The potential in the built environment for lighting alone is huge – and it's an exciting area to explore. However, not all office environments are ready to take the leap to 'high performance' just yet. At the same time, employees know that lighting is one of the areas of health and safety in which they can expect better, so it's important to implement the right solutions for them.

True human-centricity and more 'bells and whistles' Smart solutions are often out of the reach of a 'typical' office. However, there are a number of practical ways to approach both employee health and wellness and the move to a Smarter, connected office.

A refreshed, holistic look at lighting can also have a big impact on the bottom line. It's not as simple as replacing one kind of lighting for another, different areas and functions require different lighting types and configurations.

Here, we take a look at what businesses can practically do now, to evolve solutions incrementally in the best interests of the workforce and the balance sheet.

A refreshed, holistic look at lighting can also have a big impact

1 Retrofitting

A holistic approach to office building has many benefits, but what if you can't afford a complete refurbishment? Retrofit measures provide cost-effective, low-risk efficiency upgrade options for building owners who are limited to making incremental capital upgrades to their building.

Standard retrofit measures include equipment, system and assembly retrofits. Retrofit, in principle, should only have a limited impact on the physical structure of a building, so is often seen as a preferred solution in their capacity to deliver quick results.

Businesses should scrutinise their built environment: where is the most energy wasted? Where are the least occupied rooms? Starting small can still have a big impact. Look for a supplier that is able to offer an energy audit of your environment, to identify where you can get the most bang for your buck.

2 Lead with LED

An obvious place to start, because the operational expenditure (OPEX) rewards will offer ROI so quickly. Any areas of the office that still rely on incandescent should be an early priority.

3 Supplement existing solutions

As with retrofitting, you don't need to undertake a complete rip and replace. In fact, look at where you can complement your existing lighting system, such as installing vertical surface illumination to give the impression of space and improve ambience.

4 Utilise natural light

Daylight continues to be the ideal source of luminance to complement and enhance employees' natural circadian rhythms, and while 75.8% of employees state that natural light is important to them, only 56.9% percent are satisfied with the offering in their workplace. Open blinds, reposition working areas near windows, ensure that all employees have access to as much natural light as possible. This is a low cost way to use light to your advantage – without even installing any new components.

5 Plan maintenance

As a bare minimum, the lighting that is already installed, whether incandescent or LED, must be maintained correctly. Planning maintenance schedules to ensure optimal luminance is critical. Any dead or flickering luminaries should be replaced, and even cleaning goes a long way to brightening up dull luminaires.

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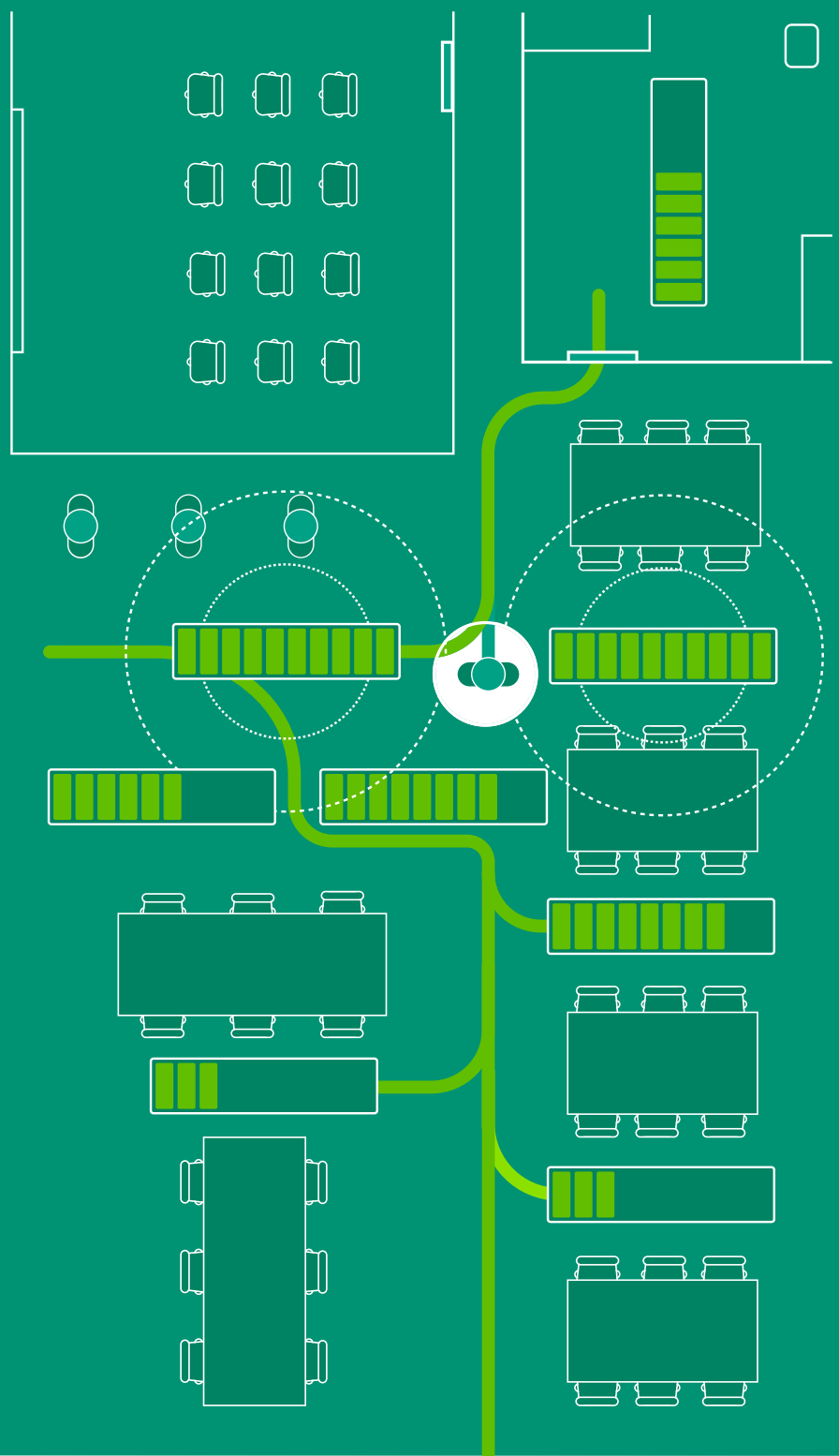
The Office as Chief Operating Officer

Approaching the built environment as the Chief Operating Officer, means having full insight into and control over the operations of every area of the environment.



Reception

The reception area in an office should make an impactful first impression. It should complement the brand look and feel, and create the mood and ambience of the brand. It's an area that needs true aesthetic consideration.

It requires low-profile, sleek solutions that create the right impression without drawing attention and without compromising on performance. Look for options that can be tailored to the needs of the space and fittings such as mini spots, circular pucks (in fixed and adjustable versions) and linear and pendant versions to ensure true flexibility.

Meeting rooms

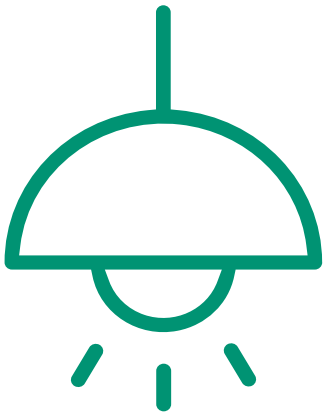
An end-to-end Bluetooth Mesh certified lighting control system works effectively in small offices and meeting rooms. The wireless, plug and play system consists of wireless luminaires, switches and sensor, it should be easy to install and even simpler to program via an intuitive mobile application, with wireless enabled luminaires controlled individually or grouped for convenient scene setting.

Using an occupancy sensor in the lighting controls, combined with the open wireless network, means that the meeting room can enjoy an infrastructure that supports room level intelligence across elements such as HVAC and sockets to create energy efficiencies and cost savings.

Open plan workspace

1. Each luminaire automatically identifies its neighbours to start working together
2. Every sensor lets other nearby sensors know when someone is detected
3. Using collective learning, the system will determine in which direction it believes the occupant is moving and sets the light levels automatically

Sylvania was involved in a major project with DIAL, the centre of excellence in lighting and electrical engineering



DIAL case study

Sylvania was involved in a major project with DIAL, the centre of excellence in lighting and electrical engineering. World renowned lighting professionals, DIAL, owe their status of top lighting specialists to their training schemes, product reviews and the successful DIALux planning software and online lighting search engine, LUMsearch. This placed them under particular pressure when it came to designing their new building.

DIAL required office lighting with independent control systems that were efficient, economical and stylish.

Results:

- The new lighting scheme complements the natural light
- It is a fully automated system
- Feilo Sylvania luminaires came out on top when benchmarked against competitors

NEN case study

The Netherlands Standardisation Institute – a developer and promoter of international and European standards – was aiming to make its premises as sustainable as possible, including optimising the efficiency and effectiveness of operations.

It implemented SylSmart Beyond, an IoT enabled lighting control system. A revolutionary, fully internet connected solution that analyses data collected by luminaires, SylSmart Beyond is installed throughout a building or at multiple sites, and available globally and in real-time through a cloud based portal.

SylSmart Beyond was created when over 1000 SylSmart enabled luminaires at NEN were connected to the SylSmart Intelligence platform. This data collection function captures space utilisation data through the lighting control system and helps analyse use trends in the building. As well as allowing for the optimisation of building performance and operation of lighting, it goes beyond lighting efficiency to include occupancy analytics too.

Capturing space utilisation data enables historical and real time data insights into how the building is used by its occupants. It is able to capture this data in high resolution thanks to the sensor density made available by the lighting system. With each luminaire containing sensors, fine grain information is made available to accurately map the use of each space in a building.

This data is used to formulate cost saving strategies such as reducing security costs, re-deploying use of space from meetings rooms to work spaces, addressing other energy using systems such as HVAC, reducing food waste in on-premise canteens and reducing cleaning costs by not cleaning unused areas.

SylSmart Beyond, an IoT enabled lighting control system

Results:

- Decentralised intelligent lighting control system installed which is able to acquire data, enabling operational insights and savings beyond lighting
- Up to 75% energy is being saved compared to a standard on / off system
- Cleaning operations have been significantly improved and costs reduced
- 5% cleaning cost saving a month

17 Connaught Place situated near Marble Arch, has recently undergone a major refurbishment.

17 Connaught Place case study

17 Connaught Place, situated near Marble Arch, has recently undergone a major refurbishment to provide up to 32,678ft² of Grade A office accommodation, which includes a garden, ground floor, and six upper floors. Concord luminaires have been used throughout the building to bring a functional, stylish and reliable lighting scheme to the reception areas, lift lobbies and stairwells as well as feature perimeter lighting in the offices.

Results:

- Delivery to a tight timescale
- Style with efficiency
- Increase control

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