



# **BUILDING THE ENERGY-EFFICIENT OFFICE**



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#### FOREWORD

Our lives are defined by the buildings we use. They not only influence how we behave in a space but, in many ways, dictate how we live, work, eat, and play each day. Their characteristics, design, look, feel, and technical standards shape our productivity, moods, well-being, and relationships with others.

Much of this is also shaped by the environment the building creates. Heating, ventilation and air conditioning all contribute to keeping occupants happy, whether warming them on a cold day or keeping them cool during a heatwave.

And all of this – as well as lighting, security systems, doors, power, elevators, escalators and may other elements –consumes electricity.

That's why, as occupants consider their carbon footprint, how much energy they consume, and what portion of emissions they are responsible for, their attention naturally turns to the buildings they inhabit. Are they in Grade A offices, Passivhaus standard residential accommodations, and carbon neutral retail destinations? Or are they in old, draughty, inefficient blocks built before the world realised the need to manage energy consumption proactively?

We know that buildings have a significant carbon footprint across their lifecycle. From build to occupancy, renovation to demolition, each stage has the potential to add to the problems facing the planet's climate.

In Europe, this challenge is exacerbated by the building stock's unique mix of historical and modern architecture, with organic urban sprawl and uneven population density putting immense strain on accommodation. Yet within that, there are opportunities to reinvent how we use buildings. Not only to mitigate climate change but to demonstrate how energy efficiency and improvements in living quality can go hand in hand.

In this paper, we'll explore how businesses can avoid inefficient energy use and take the right steps to improve their consumption.



#### **MARKET SUMMARY**

Fortunately, it's becoming harder to find a business not talking about its commitment to reducing its carbon footprint than it is to find one that is. Across the board, as net-zero targets are set by both lawmakers and companies, cutting emissions and improving an organisation's environmental impact have become major corporate priorities.

Yet while there is much focus on finding new ways to generate energy, energy efficiency offers a way of accelerating many entities' journeys towards net zero.

Here's why this is so critical. According to the European Union, "the built environment is...the single largest energy consumer in the EU. And one of the largest carbon dioxide emitters." What's worrying, however, is that about three-quarters of the bloc's building stock is energy inefficient. In addition, buildings account for approximately 40% of the region's final energy consumption and 36% of greenhouse gas emissions.

Energy inefficiency is not just an existing building issue, either. Globally, more than 110 countries lack mandatory building energy codes or standards, resulting in more than 2.4 billion m2 of floor space being built in 2021 that didn't meet energy-related performance requirements.

To combat this, initiatives like COP27 and the European Green Deal are proposing net zero targets that need to be met to tackle the challenges of climate change. The European Green Deal, specifically, aims to transform Europe into the first climate-neutral continent. Among its targets is for there to be 55% less net greenhouse gas emissions by 2030 than 1990 levels.

To do this requires all aspects of life to become more energy efficient, including buildings. According to the International Energy Agency (IEA), to meet the Net Zero Emissions by 2050 Scenario, "all countries need to establish zero-carbon-ready building energy codes for both residential and non-residential buildings by 2030 at the latest, and all new buildings should meet this standard from 2030."

This also means that renovation efforts need to be accelerated. Currently, one per cent of the existing building stock is being retrofitted to meet advances in energy efficiency. The IEA estimates this needs to increase to 2.5% by 2030 to help meet targets.

If this can be achieved, then emissions will drop. In the EU, renovating existing buildings could reduce total energy consumption by between five and six per cent and lower carbon dioxide emissions by a similar amount.

Coming at a time of volatile energy prices, this also has an economic benefit. Building occupiers cannot control how much they are charged by kilowatt hour (kWh); where they can have an impact is by improving their energy consumption. Clearly, targeting inefficient buildings offers a significant opportunity to reduce emissions, contributing towards climate change targets and helping businesses reduce costs.

#### How different parts of the world are increasing their energy efficiency

Historically, the lack of collaboration is part of the challenge around tackling climate change. The likes of COP27 and the European Green Deal have provided a unified vision with overall goals. But the different approaches create an opportunity to see what others are doing and learn from their efforts.

Examples of building energy efficiency projects include:

- The EU Building Stock Observatory (BSO), a tool that tracks the characteristics and energy performance of buildings in the EU.
- BUILD UP, the European portal for energy efficiency in buildings. Managed by the <u>Climate, Infrastructure and</u> <u>Environment Executive Agency (CINEA)</u>, it provides insights, guides, best practices and knowledge sharing to building sector professionals. BUILD UP Skills aims to increase the number of trained and qualified building professionals across Europe to deliver building renovations offering high-energy performance.
- California is encouraging the installation of efficient electric heat pumps, expanding solar photovoltaic and battery storage standards and increasing the requirements for new builds through updates to its Energy Code.
- Elsewhere in the US, Massachusetts' Stretch Energy Code Development 2022 has been updated in line with the Climate Act of 2021, helping to ensure that new construction is consistent with the state's greenhouse gas limits.
- In the UK, the government set new targets for energy-efficient buildings in 2021 to lower energy consumption and bills.
- The United Nations has relaunched its High-Performance Buildings Initiative, with centres in Bulgaria, Canada, the UK, the Republic of Ireland and the US. The initiative aims to enhance the quality of life across various areas, including energy and carbon intensities.



## DELIVERING ENERGY-EFFICIENT BUILDINGS: THE CHALLENGES

Despite the benefits available to governments, landlords and inhabitants, improving the energy efficiency of commercial buildings is a fraught process. Challenges include:

- A variety of building types: At a policy level, the diverse stock that makes up the commercial building sector in many countries is a challenge in and of itself. There are few, if any, one-size fits all solutions. In the UK, for example, listed building status can make it hard to make any modifications without compromising, and falling foul of, relevant regulations.
- Lack of data: A lack of data that allows policymakers to quantity and understand the nature of energy efficiency needs is also a significant obstacle. In the UK, for instance, in March 2023, the government was still reviewing the feedback from a consultation on introducing a national, performance-based policy framework for rating the energy and carbon performance of large commercial and industrial buildings.
- Limited understanding within businesses: Companies want to improve their energy efficiency – 56% of commercial energy use was by companies actively seeking ways to reduce usage. Yet without data, there can be no measurement, and without measurement, no action. Businesses, as a whole, struggle to collect and interpret information on energy usage and, therefore, cannot develop solutions. Additionally, utility providers often provide billing in terms of kWh, yet few companies have the resources to translate that into financial costs. This only further muddies the waters.
- No efficiency strategy: Whether landlord or tenant, thanks to a lack of understanding, many companies fail to come up with actionable energy efficiency strategies that are aligned with business outcomes. As a result, any attempts to improve energy consumption that conflict with overall corporate goals will likely face considerable pushback and de-prioritisation.

**Poor internal coordination:** How embedded are sustainability key performance indicators (KPIs) across the organisation? Are facilities' main targets cost or emissions-based? Do stakeholders understand the link between initial investment and long-term efficiency returns? In large-scale organisations, ensuring everyone is on the same page is challenging. It's all very well having corporate statements around sustainability, but how aligned are processes, policies and objectives to those goals?

- **Disconnected tenants and landlords:** It's rare for occupiers to be owners of commercial buildings. Particularly in office blocks, multiple tenants operating with different structures and resources can make it hard to define energy efficiency policies and ensure they are enforced. Equally, tenant companies may have goals that aren't aligned with their landlords'.
- Outdated, disconnected utilities: Old lighting, antiquated heating, ventilation and air conditioning (HVAC), poor insulation, singleglazed windows, and other legacy fixtures are major issues that can severely impact energy efficiency efforts. Even worse? Older technology cannot generate the data businesses need to manage their energy consumption, meaning that teams don't have the information they need for sustained, measurable improvement.
- Funding challenges: Say energy efficiency, and many will start to think about how much it will cost, even if the end benefit is a reduction in outgoings. Despite the many initiatives, businesses often struggle to understand where funding is available. At the same time, the initial investment for a cash-strapped company can mean that, even with longer payback periods, they cannot pursue capital expenditure projects.

In short, there are a variety of challenges at all levels, from tenant occupiers to government policymakers. Yet while in the past these would have been reasons for not pursuing energy efficiency measures, rapidly rising energy costs and net-zero targets and increasing regulation means that they impede, rather than stop, progress.

There is another driver for overcoming them: a competitive edge. Businesses that can improve their energy efficiency *will* reduce costs, even when prices remain high. This cash can be redeployed as they see fit, improving liquidity when others may be struggling to cover operating costs. Plus, demonstrating tangible action to improve a company's footprint can be a selling point for customers, investors and potential employees.

#### **STEPS YOU CAN TAKE**

There are challenges, but there are also solutions. While every business is different, there are several steps that all companies, whether landlords or occupiers, can take to improve their energy efficiency:

- Embed energy efficiency into company culture: One study found that small and medium-sized enterprises (SMEs) could reduce energy bills by between 18 and 25% by installing energy efficiency measures and implementing behavioural change. This highlights the importance of getting workforces bought into being energy efficient. Turning off lights, not running machines unnecessarily, and incorporating energy consumption into procurement decisions are big and small examples of actions that can become second nature to workforces.
- Turn off equipment: Linked to this need for an energy-efficient culture is understanding the cost of leaving office equipment on standby when not in use. That extends to keeping supposedly portable devices with enclosed power sources, such as laptops and tablets, constantly plugged in. It's estimated that the cost of leaving a laptop plugged in costs £7.74 a year not much, but multiply it by a workforce of 100 people, and it starts to add up. Making your occupants aware of this issue and encouraging them to power off their devices accordingly can make a world of difference.
- Ensure equipment is working properly: IT equipment was second only to heating when it came to office energy consumption. This is because devices that don't work properly will still use energy, but it might take more to get the same output from them, or people will avoid using them without ensuring they are switched off and disconnected.Ensuring your equipment functions properly is critical to effective energy efficiency efforts.
- Don't forget the drinks: Most companies provide break-out areas, kitchens and other ways to relax and have a drink or a snack. These are often equipped with the same sort of appliances that people have at home: microwaves, kettles, dishwashers, sinks and fridges. There may also be vending machines and drink dispensers. All of these appliances contribute to energy consumption, so all must be regularly checked to ensure that they are operating effectively. Where possible, smart systems can be deployed to assist. Smart hot water taps, for example, use up to 55% less power on standby and can be combined with scheduling controls to manage energy use.

- **Get smart with your lighting:** In modern office spaces, there should be no reason not to use Light Emitting Diodes (LEDs) to reduce energy and costs without compromising illumination. However, many may not be deploying smart lighting systems, which adjust luminance based on occupancy. In addition, natural lighting should be considered and utilised wherever possible; an office that gets the sun for most of the day may be lovely, but if occupants have the blinds down and the lights on to minimise glare, that's unnecessary energy expenditure. Daylight blinds allow the light in without everyone being dazzled by brightness.
- Keep it clean: Maintaining clean workplaces is critical, but if cleaners only enter the building when the rest of the occupants have gone home, energy use is sustained for a longer time and at lower occupancy. Smart utilities which respond to movement ensure that cleaning crews can operate in well-lit, ambient environments without having the whole building or floor lit up like a Christmas tree.
- Know when someone is in: One low-tech way of managing energy is to deploy timers to switch utilities and services on and off. And while that does help, it doesn't reflect the flexibility and evolving working patterns many businesses operate. Plus, it assumes when people will be in the office rather than knowing. With occupancy sensors, utilities are used when needed; the user experience remains consistent, but energy usage is managed more effectively.
- Adjust ventilation: A third of a building's heat is lost through air infiltration and ventilation alone. If a building's HVAC systems operate on schedules, an unseasonal heatwave could leave occupants opening windows without being able to adjust the heating. Managing ventilation means that individuals can enjoy the environment that works for them without causing unnecessary energy loss.

These might seem like disconnected steps, but when examined through the prism of people, processes and technology, it becomes clear how interconnected energy efficiency efforts need to be. And all three areas must be considered: it's no good investing in smart, connected equipment and utilities if people will not use them properly or do not change behaviours in line with new processes.



### **GET STARTED**

We've armed you with many ideas and initiatives, but it can be hard to know where to start. To help, we've compiled this step-by-step checklist:

- Understand what funding is available and which government and industry initiatives apply to you. That way, you will be able to establish meaningful KPIs and know what overarching goals to reach.
- 2. Find out how efficient your premises currently are. Audit your equipment, review your Energy Performance Certificates and identify opportunities for improvement.
- **3. Look for quick wins.** Like any change programme, you will need to convince decisionmakers if you wish to operationalise energy efficient changes. The easiest way to make a business case is to find pilot projects that can be designed, initiated and reported on quickly, with clear results that can help demonstrate the value of expanding the programme.
- **4. Monitor.** As mentioned before, without measurement, there can be no action, so keep a watching brief on your key energy performance metrics so that you can spot areas to improve quickly.

- 5. Use the data you are generating to inform and influence cultural change. You won't achieve your goals if the organisation does not buy into energy efficiency measures, and all key players need to feel part of the process. It is key, then, to communicate what you're trying to achieve and how it will benefit them.
- 6. Get people on your side. As part of your cultural change programme, you'll need people on the shop floor who can champion your efforts and provide trusted feedback on what's truly feasible and what needs adjusting.
- **7. Celebrate success.** When executed effectively, energy efficiency measures will have a real impact, so highlight where efforts have worked. This isn't showing off; it's demonstrating that results have been achieved.
- 8. Keep going. Energy efficiency is an ongoing process; there will always be something that can be improved and altered, new employees to onboard into the company's approach, and new equipment to be assessed and integrated into the strategy.



### **HELP IS AVAILABLE**

No business can implement energy efficiency measures by itself. It requires builders, electricians, plumbers, landlords, tenants, employees, customers and other stakeholders to all contribute. One area in particular, that needs to be kept front of mind is the gathering and use of data. A truly energy-efficient commercial premise will be generating information from all sorts of sources, so having a way to capture it all and make sense of it is critical.

When looking for a partner in this area, businesses should consider:

- How they integrate hardware: You'll be connecting everything from digital signage and devices to sensors, smart utilities and connected facilities, so whatever systems are used need to work with multiple equipment types.
- How they'll be notified: Some data will provide insights into overall trends that can inform long-term behavioural shifts; others will be alerts that need action. With workforces increasingly dispersed, any monitoring system needs to be adept at notifying the right people in the right way, whether by email, messaging, automated voice messages or even alarms.
- How they'll review data: Energy consumption information is not often the easiest to understand, so any dashboard needs to consolidate knowledge and show users with varying levels of expertise what they need to know.

- What they'll control: Even in large companies, the teams managing facilities will often be relatively small, with significant areas to cover. Being able to control multiple sites, receive information rapidly and take action irrespective of location is critical.
- How they'll be protected: Smart and connected facilities can help automate the office environment

   but they are often vulnerable to attack.
   Deploying new digital systems that are secure and backed up, with data privacy embedded, is a must to give everyone peace of mind.
- Who they can speak to: No system is perfect, so having knowledgeable, accessible customer support is a must. If a power outage has upset the system and physical access is limited, solutions must be available rapidly.

## IMPROVING ENERGY EFFICIENCY IN ACTION: HOW MITIE CONNECTED 3,700 SITES

Mitie is one of the world's leading facilities management and professional services companies. With a diverse customer base in various industries – including retail, commercial real estate, government and manufacturing – Mitie's teams provide facilities management services to many different locations. In total, it looks after more than five million assets.

Helping its customers reduce costs and optimise the uptime and performance of their assets is a major focus for Mitie. But it struggled to find a solution without expanding its workforce, a costly exercise.

In stepped Accruent. The two companies partnered to add Accruent's remote monitoring solution to Mitie's portfolio of services. This allowed Mitie's customers to demystify equipment performance issues and perform proactive maintenance and energy-saving measures. In addition, they were able to gather valuable insights to support further action and decision-making.



### CONCLUSION

The ongoing high cost of energy – along with net-zero targets – means that energy efficiency has vaulted to the top of many companies' priorities. Yet even without that volatility, the change would have been required; at most, it has made many companies accelerate their efforts to reduce energy consumption and improve efficiency.

And it will continue to be a focus. However, knowing where to begin can be daunting for companies that have yet to start. Many are already undergoing operational transformation. The same processes and approaches can be applied to improving energy efficiency: embedding the right culture, investing in new technology where appropriate and ensuring supporting processes are in place.

Upfront costs can be a concern, yet several government and industry initiatives are available to help businesses take those first steps. If anything, public sector support should highlight how critical energy efficiency is and how important an agenda item it is. As previously noted, without it, globally, we are unlikely to meet net zero targets in time to arrest climate change challenges.

#### **FIND OUT MORE**

Interested in understanding how you could improve your energy efficiency, or ready to consider how you can gather the right data? Speak to one of our team today.

#### **SPEAK TO A SPECIALIST**



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#### **ABOUT ACCRUENT**

At Accruent, we're building a more connected future where your people, systems, and data work synergistically to drive informed decision-making, operational excellence, and business growth. As the world's leading provider of workplace and asset management software for unifying the built environment, our solutions deliver not only the promised results but also illuminate possibilities you couldn't see before. Coupled with our deep industry expertise and world-class professional services, you can depend on us to help maximise the investments in your people, assets, and facilities.

