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Sustainable buildings: rethinking workplaces for a healthier future

Toby Morgan of Climate Group explains how future-fitting your workspace benefits the climate, the workforce and the bottom line

There is an urgent need to decarbonise the built environment and become net zero through the entire lifecycle by 2050. This starts with construction, but continues through everyday use and eventually in demolition.

The buildings where we work, including offices, factories and healthcare settings, are contributing to emissions so it is imperative that businesses are engaged on this agenda. The good news for organisations is that, by improving the sustainability of their buildings, they can also create healthy environments to work in, which is vital for productivity. It's a win-win for both the climate and the profit line.

However, we are currently not on track; building renovation rates need to double or even triple to achieve the emission reductions required. So how should organisations work towards a more sustainable future?

Reducing your building's carbon footprint

Traditionally, there has been a school of thought that the best way to increase building sustainability is to demolish old, inefficient buildings and replace them with new, shiny skyscrapers. However, there is now a growing push for retrofitting old buildings and bringing them up to scratch. It's far less carbon intensive to retrofit a building than to demolish and construct a new one. Think of all the steel, concrete and glass which is needed. These materials are all energy intensive to produce, which means that many new buildings have high 'embedded carbon' – the emissions which are locked into buildings' footprints – before they've even been used.

With rising global temperatures, an increase in development and the resulting increase in emissions from buildings, it is imperative that we decouple energy use from increased building floor areas. This can be achieved through:

- transforming the construction industry, and limiting the amount of energy and resources which go into buildings
- eliminating fossil fuel use for heating and electricity in buildings
- maximising energy efficiency by using the cheapest and cleanest energy possible
- installing sustainable technologies, such as heat pumps, insulation and intelligent building management systems
- ramping up the transition to renewable energy sources, such as wind and solar power.

The role of new technologies in building sustainability

The technologies to increase building renovation rates do already exist and this transformation is vital to achieving climate goals. It is also essential to use these in working towards climate resilience (how protected we are to future climate change) and energy security (the reduction of fossil fuels to create a more energy-secure future). This has been particularly brought into focus recently with the situation in Ukraine, and Europe's reliance on Russian oil and gas. By maximising energy efficiency, we can reduce the amount of energy used in the first place and enable a quicker and cheaper transition to renewable energy sources.

It is also imperative that businesses are committed to this strategy, as investment in sustainable, smart technologies and digitalisation provides ways to lower energy bills, reduce risk and improve efficiency. This is especially true of developing economies which will experience higher temperatures and more extreme weather events as global warming continues.

Think of an average office you pass at night with all the lights left on. Occupancy sensors can ensure that only those that are really needed are used, and this can be linked to the heating, ventilation and air conditioning (HVAC) systems too. So, if we start using energy in a smarter way, we can save carbon and also money on reducing waste.

Creating a healthy workplace

Since the pandemic, working patterns have changed for many workers – perhaps permanently. While employees and employers have seen benefits of hybrid working, the advantages of being together in a workplace and working collaboratively can also bring

unquantifiable benefits to organisations.

These changing work patterns also bring challenges for building managers. However, by gathering and analysing data, we can start to look at how a workplace is operating. Does an organisation need to rent such a large office, if only 40% of it is being used due to hybrid working?

Furthermore, we all know that the most important (and costly) part of any business is the workforce. There is growing evidence of the effects that buildings (in which we spend 90% of our time) have on our physical and mental health. Simple measures, such as installing sensors to monitor indoor environmental quality, can provide invaluable data insights to any organisation.

A Harvard study, conducted across six countries, has found that poor indoor air quality negatively impacts cognitive function. Office workers were given colour-based and arithmetic-based tests and, where CO₂ levels were higher, workers' response times and accuracy was significantly slowed. Another study by the World Green Building Council found that increasing ventilation and lowering levels of CO₂ in the workplace from 1000ppm to 500-600ppm delivered an 8-11% improvement in productivity.

If we link the CO₂ level monitoring with the ventilation system, building managers can ensure that ventilation is automatically increased when employees are exposed to higher CO₂ levels, thus increasing productivity levels. When we start to gather these types of insights, we can see the full benefits of having intelligent, healthy and productive workplaces.

Overcoming barriers

While many companies are interested in sustainable and productive buildings, they may encounter a number of common barriers to implementation. How can these be addressed?

1. **Begin with smart data:** Energy is one of the biggest cost areas for companies, but it's surprising how frequently it goes unmonitored and unmanaged. Many forward-thinking companies begin with data acquisition and strong energy management and use this as the platform from which to scope and launch energy efficiency projects. They understand that smart data leads to smart energy use.
2. **Trial innovative ways to overcome upfront costs:** Companies will eventually come up against technologically-complex and therefore more expensive energy efficiency projects. A number of companies are experimenting with a voluntary internal carbon

cost to create a consistent revenue stream for projects, as well as using pilot schemes to better understand the risks associated with large-scale deployment.

3. **Commit to a climate change initiative:** Joining a campaign, such as Climate Group's 'EP100', will encourage organisations to publicly set ambitious energy efficiency targets and report transparently on their progress. Company by company, this will build a powerful market signal to create demand for the technologies, capital flows and policy frameworks needed to accelerate global action on energy efficiency.

Companies need to start investing now to ensure that their buildings – offices, warehouses, factories and everything in between – are fit for the future. By investing in future proofing their buildings and making them climate resilient, they are also investing in the health and wellbeing of their employees.

What is the payback period?

This is the most commonly asked question by the budget holder when any retrofit project is mentioned. However, the more we know about the multiple benefits of having efficient, healthy and productive workplaces, the less a simple return on investment (ROI) calculation is adequate.

Intelligent and healthy buildings should not only lead to energy use reduction, but also to improvements in worker wellbeing and productivity, reduced absenteeism, as well as the attraction and retention of talent. The growing evidence of these benefits must be taken into account when assessing the viability of any project.