



AIRTHINGS

HEALTHY BUILDING  
SOLUTION

# How improving office air quality unlocks greater productivity, wellbeing and operational benefits

Find out how monitoring and improving IAQ makes a positive difference to both office environment and the bottom line

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# Foreword



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Increasing awareness of the negative impact poor internal air quality (IAQ) can have on health is driving demand for smart office buildings designed with wellbeing in mind. Ignoring or failing to respond to this issue is no longer an option. Air quality is now one of the most important 'basic' [factors](#) for office workers. So employers would be well advised to give this element of the working environment just as much attention as comfort and cleanliness, in order to attract and retain great talent.

Productivity is also closely linked to the quality of the air that we breathe. An increasing number of [studies](#) point to the damaging effects of poor IAQ in terms of performance, absenteeism, and illness rates. Looked at another way, spending just US\$40 per person on IAQ can increase an employee's productivity by [\\$6,500](#).

In this context, the argument for monitoring and improving IAQ in every office workspace is compelling - particularly as contamination levels

inside have been found to be up to [five times higher](#) than outdoors. Not only that, for those responsible for the efficient running of the building itself, there are measurable benefits to be gained from effective management of IAQ in terms of greater operational efficiencies and cost-saving.

To unlock these benefits, you need to be better informed about the level of contaminants in the working environment so that necessary action can be taken. Radon, CO<sub>2</sub>, total volatile organic compounds (TVOCs), humidity, temperature and pressure can all interfere with workers' concentration, energy levels, and output.

The good news is that there are solutions that can be used to improve IAQ conditions and deliver a significant return on investment (ROI). In this guide, we explain the implications of poor IAQ for office buildings, then explore the many benefits of adopting an effective IAQ monitoring system.

# Why indoor air quality matters in office buildings





Given that the average employee spends over [a third](#) of their life at work, it's not surprising that office workers are demanding more from their place of business – particularly the younger generations. This lifestyle-driven, tech-savvy audience expect employers to invest in creating environments designed to support their overall wellbeing – and that includes IAQ.

The fact that home air quality monitoring devices are becoming more [widely used](#) is also helping to fuel awareness. As people become more familiar with common indoor air contaminants at home, they are increasingly looking for reassurance that this important aspect of their working environment is being monitored to safeguard their health.

This is driving a dramatic shift in perception; concern about indoor air quality now encompasses every building where we spend a large amount of time. So, it's no surprise that workplace environments are now firmly under the spotlight. IAQ is no longer simply an issue for the home, but for those running offices and buildings too.



Most influential of all, however, is the growing number of scientific reports warning of the risks associated with high levels of indoor air pollution. Poor IAQ has been [linked](#) to a range of symptoms from tiredness and loss of concentration to depression, anxiety and even cancer, in the case of radon.

Employees are certainly noticing the effects: one in three believe that poor IAQ is affecting their health and has a negative impact on their [productivity](#).

The message is clear and the economic consequences significant; over [\\$168 billion](#) is lost to the US economy every year because of poor IAQ.

As a result, those responsible are under even greater pressure to demonstrate commitment to the cause. So where should they be focusing their efforts?

# Causes and consequences of poor IAQ

To understand the scale of the issue, it's important to know which substances are of most concern and how certain office conditions play a role in workers' comfort, health and productivity.



**Radon** – Naturally-occurring, invisible and odorless, this gas seeps into commercial buildings through the foundations and can build up in those that are particularly well-insulated. Responsible for up to 22,000 lung cancer deaths in the US [every year](#), it is the leading cause of lung cancer among non-smokers globally.



**TVOCs (total volatile organic compounds)** – These substances are emitted from standard office cleaning products and equipment, such as cleaning agents, floor and wall coverings, paints and furniture. Levels can be further boosted by heat from computers and other electronic devices. They contribute to long-term problems like cardiovascular diseases and lung cancer. They cause [short-term](#) issues, like headaches, inflammation of the nose, throat and eyes, and flare-ups of pneumonia or bronchitis. They have also been associated with aggravating respiratory issues, including [asthma](#).



**Carbon dioxide** - Emitted naturally by breathing, CO<sub>2</sub> can build up in poorly ventilated offices, particularly where air is recycled. High concentrations are [linked](#) to poor decision-making, low productivity, infectious disease transmission, and sick leave.



**Humidity, temperature, and air pressure** - These conditions affect how employees feel and perform. They are [linked](#) to complaints like dry or irritated eyes, coughs and colds, headaches and migraines, variations in [blood pressure](#), and joint pain.



**“It has now been shown beyond reasonable doubt that poor indoor air quality in buildings can decrease productivity in addition to causing visitors to express dissatisfaction.”**

David Wyon,  
International Centre for Indoor Environment and Energy,  
Technical University of Denmark.

# Addressing the issue

When it comes to creating healthy IAQ in buildings, the issue is far from straightforward. Not least because what constitutes a high-performing office building looks completely different when viewed from the perspective of air quality. For example:



Meeting rooms may be designed for high occupancy, but if poorly ventilated, this can result in harmful levels of CO<sub>2</sub>, potentially causing restlessness and drowsiness among the team.



Buildings may be well insulated to comply with environmental and energy efficiency standards, but at the same time risk a potentially harmful build-up of radon gas.



Windows may be sealed to reduce energy loss, but in extreme cases this lack of ventilation has been linked to Sick Building Syndrome. In fact, more people in the UK have reportedly been feeling ill in buildings since energy efficiency measures were first put in place in the [1970s](#).

This doesn't mean, however, that taking action on IAQ automatically means an organization must spend big and take a hit to the bottom line. In fact, there are a number of significant operational and commercial benefits to be gained from addressing IAQ.

# Good IAQ boosts productivity



When you monitor and improve air quality, employees are happier and healthier at work. They are more comfortable, think more clearly, and make better decisions. These behaviours not only improve job satisfaction – and thus staff retention – but also have a direct impact on performance. This is supported by clear and compelling evidence:

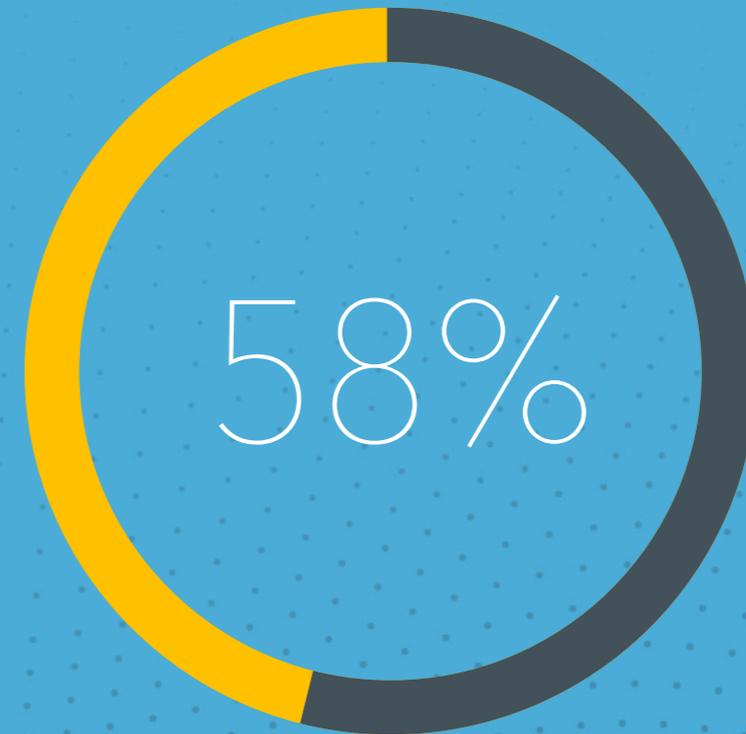


### Improved decision-making

A study co-written by the Harvard T.H. Chan School of Public Health found that improving indoor environmental quality boosted decision-making scores by up to 101%. It calculated the financial benefits brought by better quality air at [\\$17,000](#) per employee, per year.



### Reduced sick leave



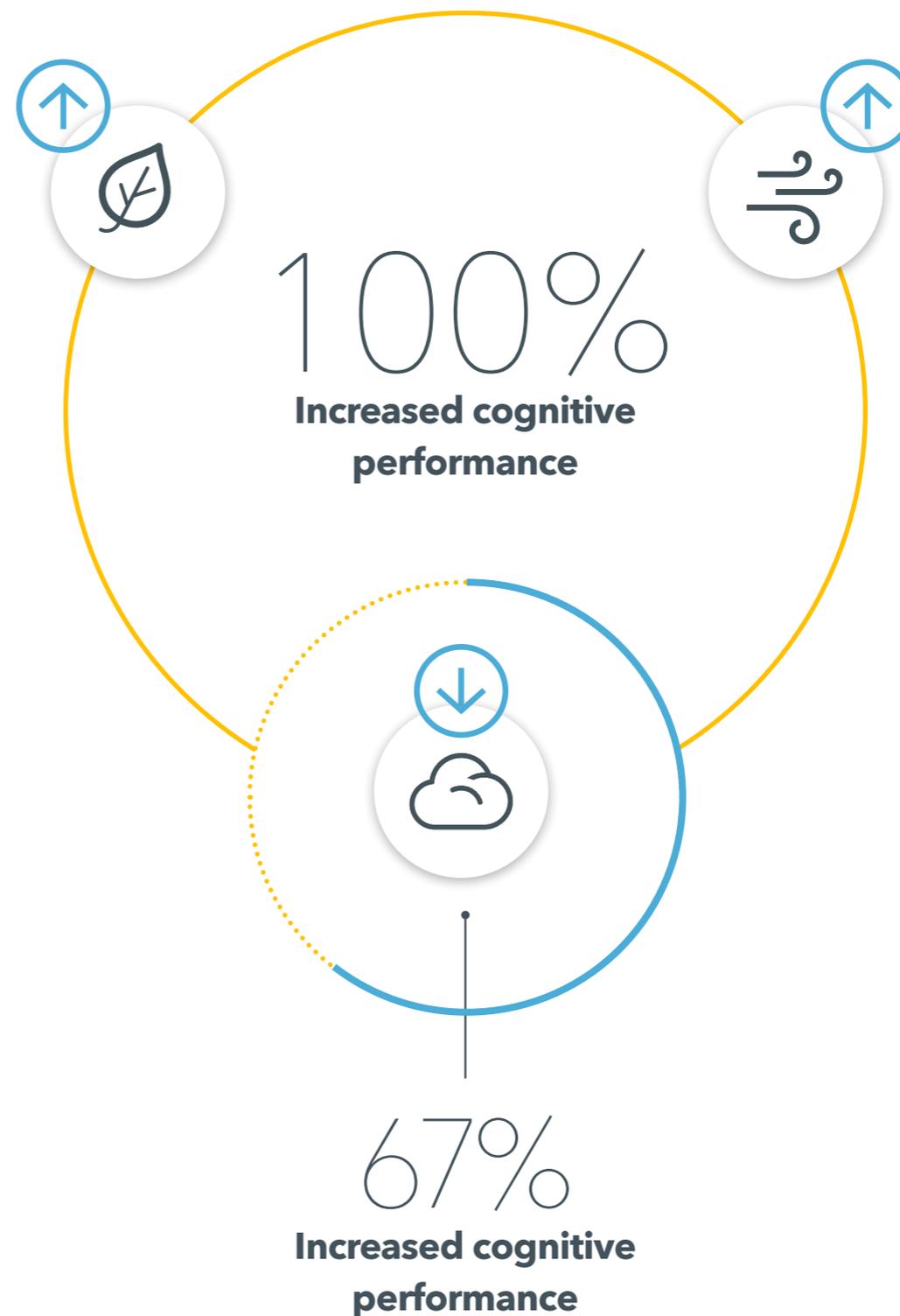
In 2018, the World Green Building Council published a [report](#) that shows a healthier work environment can reduce sick leave by 58% - the equivalent of four days per worker, per year.



## Enhanced cognitive thinking

A recent study by teams from Harvard and Syracuse Universities found better results for employees undertaking regular tasks in simulated 'green conditions.'

Where ventilation was improved and levels of carbon dioxide and emissions were reduced, they performed 61% better on cognitive tasks than in standard office conditions. What's more, doubling the ventilation in the green condition environment increased cognitive performance by more than 100%.





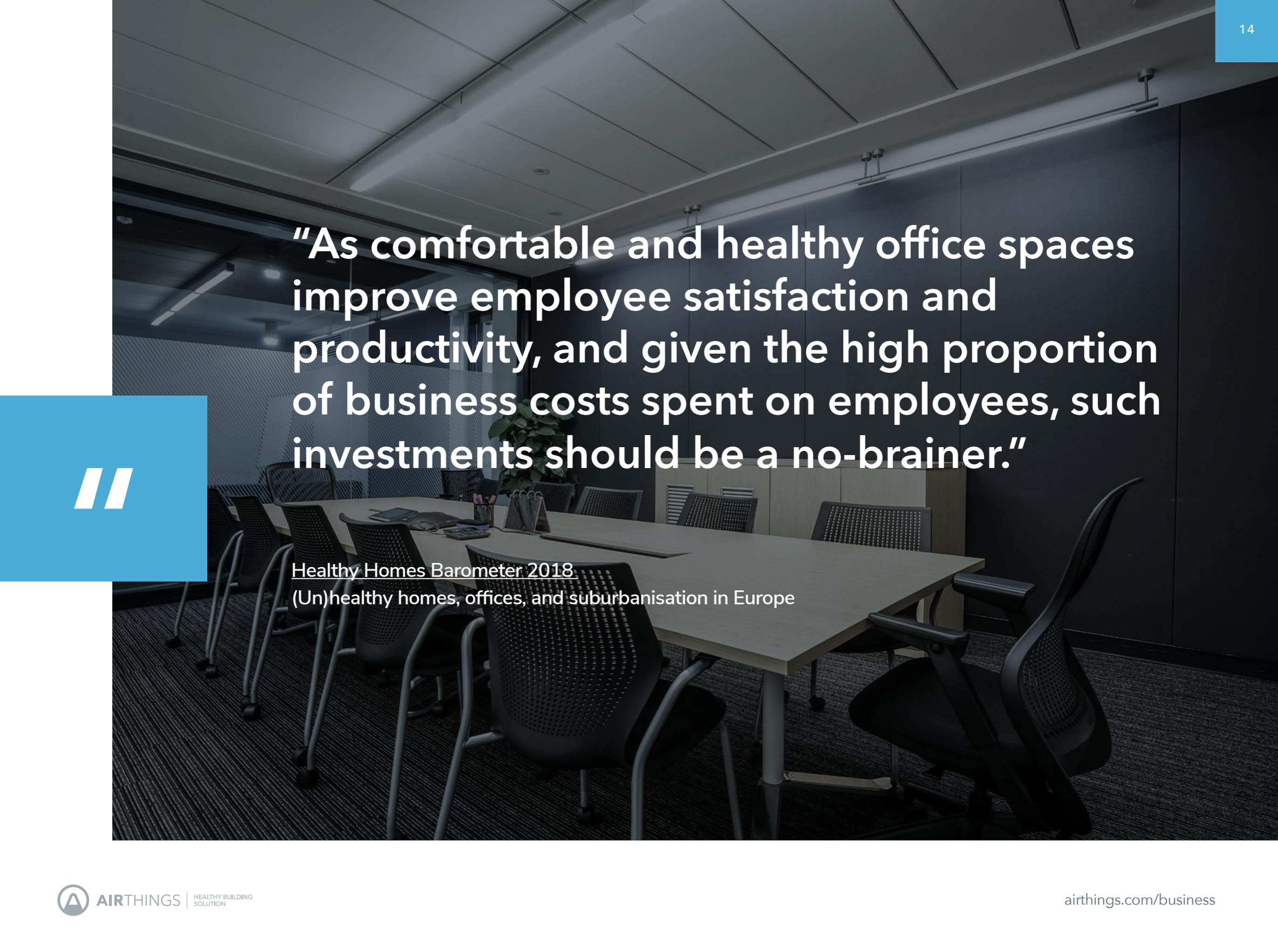
## The ROI of indoor air quality

Of course, what's equally important for those tasked with monitoring and improving the environment in office buildings is that activity also delivers a tangible ROI. Budgets need to be justified, whether in terms of business performance, employee retention, energy savings or operational costs.

This is an essential part of any IAQ strategy and highly influential when it comes to convincing the decision makers that making changes is an astute business move. This is why attention is also being paid to evaluating the commercial value of addressing IAQ.

[Research](#) published in the Environmental Journal of Research and Public Health, for example, has shown that spending just US\$40 per person, per year, on indoor air quality results in a US\$6,500 increase in employee productivity.



A modern conference room with a long, light-colored table and several black office chairs. The room has a glass wall on one side and a dark wall on the other. The ceiling is white with recessed lighting. The overall atmosphere is professional and clean.

**“As comfortable and healthy office spaces improve employee satisfaction and productivity, and given the high proportion of business costs spent on employees, such investments should be a no-brainer.”**



Healthy Homes Barometer 2018  
(Un)healthy homes, offices, and suburbanisation in Europe

# Monitoring IAQ boosts operational efficiency





Putting an effective IAQ monitoring system in place also means that the entire office building will become more efficient.

The technology built into the latest IAQ monitoring devices displays both real-time and historic data on conditions in every part of the building in one central hub. This removes the need to physically monitor key locations, which can be a time-consuming and labor intensive process.

It means that if there is a problem in one of the meeting rooms – rising CO2 or dropping temperatures for example – it will be immediately identified with an alert. Action can then be taken to resolve the situation quickly before it escalates.

This data-driven approach also allows occupancy of different spaces throughout the day to be analysed. This builds a picture of which spaces are well used, which are not and even which rooms are being booked for meetings but not actually filled – something offices of every size experience on a daily basis.

This detailed information can then be used to inform energy usage, heating, ventilation and air conditioning schedules, as well as cleaning and catering requirements.

This paves the way for significant cost savings in the short term and provides a solid basis for future office improvements. One building saved \$5.6million by cancelling a plan to rent and refurbish a whole floor and add new meeting rooms. Instead they used the data to make better use of existing spaces.

IAQ insights can be applied to make the building work harder, guiding more efficient use of space, informing renovation plans and enabling cafeteria and retail stock levels to be matched to volume of footfall.

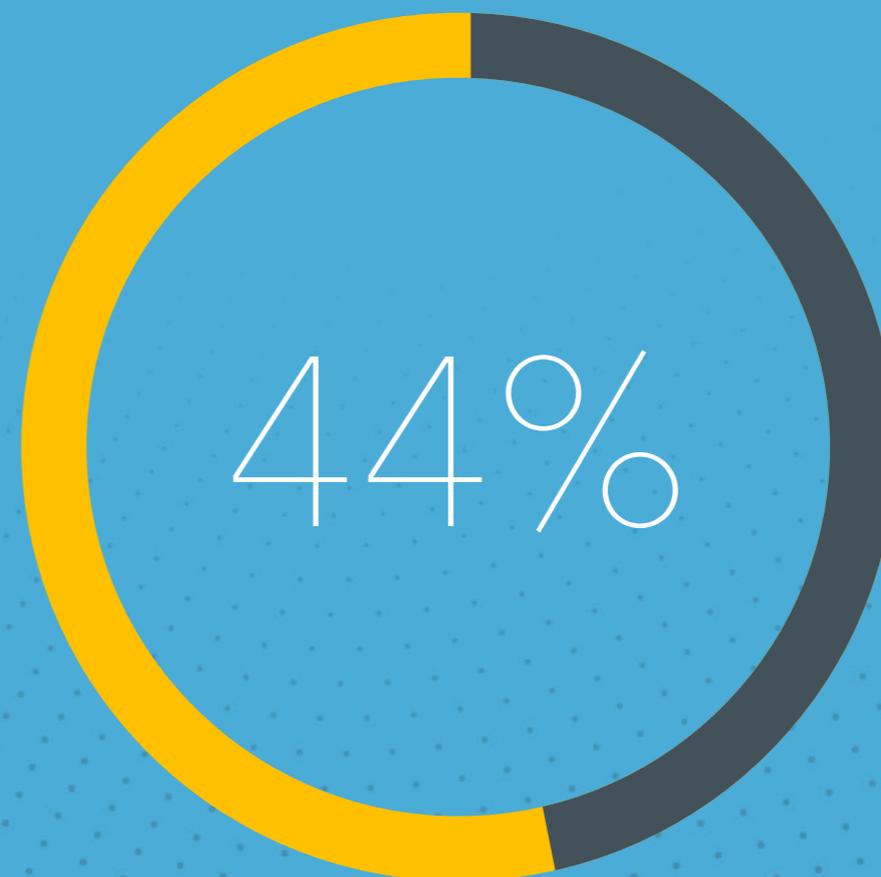


# IAQ management provides a unique point of difference



Ultimately, the goal is to use sophisticated IAQ monitoring systems to achieve a smart building built around the occupants and their needs. In this building, data is used to optimize systems for maximum efficiency and maintain ideal working conditions for employees. Currently, 44% of workers believe their office isn't smart enough. Installing IAQ technology is a quick and easy way to respond, winning you smart building status instantly.

It's an exciting prospect for everyone involved, from employees, HR professionals and tenants to facility managers and building owners. Those adopting this forward-thinking, data-led approach are the ones who stand out from the crowd and reap the benefits of improved indoor air quality.



**of workers believe their office isn't smart enough.**



**Good IAQ is something that needs to be actively managed.**

Without intervention, office buildings can harbor high levels of harmful substances and create conditions which are detrimental to not only health and wellbeing, but productivity too. That's why the latest IAQ monitoring systems are designed with ease-of-use in mind; operating from one central hub. Instead of being difficult or time-consuming, the technology does the hard work for you.



# Conclusion: Now is the time to act on air quality





Office buildings are full of dynamic spaces, which can be full one day and relatively empty the next. Day-to-day and even hourly changes can have a significant impact on working conditions. So it's essential to have the technology in place to monitor air quality in real time and be in a position to use this data to make vital adjustments.

IAQ monitoring benefits everyone. Employees want the reassurance that the air they breathe is safe. Forward-thinking organizations need to create the optimal working conditions to attract the best talent and benefit from a happy, healthy and productive workforce. And property managers need to improve operational efficiency and deliver tangible ROI.

Building code initiatives such as the US Green Building Council's LEED system and the WELL Building Standard are increasingly recognizing the importance of good IAQ. Meanwhile, it is firmly on the radar of institutions like the [World Health Organization](#), the [US Environmental Protection Agency](#) and the [European Commission](#).



The issue of IAQ is only going to gain greater momentum and is ultimately highly likely to become a requirement as public bodies and regulators turn their attention to the matter. That's why it makes sense to reap the benefits sooner, rather than later.

Why simply watch as other organizations access the advantages of intelligent IAQ technology and use their data to drive efficiencies? There really has never been a better time to take action.

# Takeaways





## Calculate your company savings when monitoring indoor air quality

How much money can your company save from having healthier indoor air?

How many employees do you have?

22

And what's the absence rate in office?  
The US average is 2%

10%

CALCULATE YOUR SAVINGS

# Find out what ROI would look like for your customers' businesses with the ROI calculator.

USE THE ROI CALCULATOR