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The Air That We Breathe

How changing attitudes to air quality are impacting the UK property sector

The Science of Air Quality

Air quality is measured with an Air Quality Index, or AQI. The AQI works like a thermometer that runs from 0 to 500 degrees. However, instead of showing changes in the temperature, the AQI is a way of showing changes in the amount of pollution in the air.

The main pollutants of air are carbon monoxide, nitrogen dioxide, ground level ozone, particulates, sulphur dioxide, hydrocarbons and lead. Each has different sources, health effects and chemical behaviours, making the task of understanding and controlling air pollution as a whole very complex.

In this context, the presence of airborne particulate matter (PM) is of particular concern. It is not a single pollutant, but rather is a mixture of many chemical species – a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings.

Particles vary widely in size, shape and chemical composition, and may contain inorganic ions, metallic compounds, elemental carbon, organic compounds, and compounds from the earth's crust. Particles are defined by their diameter for air quality regulatory purposes. Those with a diameter of 10 microns or less (PM10) are inhalable into the lungs and can induce adverse health effects. Fine particulate matter is defined as particles that are 2.5 microns or less in diameter (PM2.5). Therefore, PM2.5 comprises a portion of PM10.

These are the terms and measurements that are most regularly associated with the assessment of air quality.

Property takes a deep breath

The quality of the air that we breathe has come into sharp focus in the wake of the pandemic. However, even prior to 2020, it was already rising fast on the workplace agenda and was also a growing challenge for major cities.

Living with poor air quality has an insidious long-term effect which leads to life-shortening health. The Air Quality Life Index estimates that life expectancy lost to particulate pollution makes it more devastating than communicable diseases like tuberculosis and HIV/AIDS, and behavioural killers like cigarette smoking.

On a less profound level, poor air in the workplace has a demonstrable effect on cognitive function. That feeling of drowsiness after lunch is often not simply because of the food you've just eaten, it's often because the oxygen content of the air around you has become depleted.

A one-year study on air quality by Harvard T.H. Chan School of Public Health which concluded this Autumn involved participants in offices across six countries. It found that increased concentrations of fine particulate matter and lower ventilation rates (causing higher using carbon dioxide levels) were associated with slower response times and reduced accuracy on a series of cognitive tests.

For the property sector, the challenges presented by delivering enhanced and healthy air quality are substantial. Whereas occupier attitudes to their ambient environment previously focused predominantly on temperature and light levels, the quality of air in a workplace or, indeed, any publicly shared enclosed space will be a matter for scrutiny and also will affect the long-term attractiveness of buildings.

This paper explores how the issue of air quality is impacting the UK property sector; reports on research which shows how attitudes to the quality of the air that we breathe have changed substantially following the Covid-19 pandemic; and looks at what this means for property asset management and occupier engagement.

Real air for real estate?

This new awareness of air quality and the developing attitudes towards it are of growing importance for real estate providers across the commercial and residential sectors.

To give some attitudinal context to the topic, we carried out a survey, *Air Quality In The Workplace*. It canvassed the views of 200 people aged between 25 and 55 who work in offices across a variety of UK business sectors.

The responses made it clear just how much the pandemic has focused people's thinking on the topic with 86% of respondents saying that the issue of air quality in the workplace was now more important to them.

The survey also reveals that there is a divergence of opinion about how you can access good quality air. Three quarters of those surveyed said they would prefer to open a window for ventilation rather than work in an air-conditioned building. Whilst this may reflect an inherent distrust of air which is seen as being simply cooled and recirculated, the latest filtration systems can achieve a quality of air in a building which is substantially better than that of the environment which surrounds it – especially if it's an urban setting.

This is graphically illustrated in China and India where urban pollution is a serious problem and hotels routinely market themselves on the basis of the quality of the air inside the hotel.

The Cordis Hongqiao Hotel in Shanghai has a pollution monitor in every room which shows the levels of PM2.5 — the measure of potentially harmful particulate matter in the air which can lodge in people's lungs. It claims that the air quality inside the hotel is 10 times better than that in the surrounding streets of Shanghai. So, in this instance, opening a window would really not be the solution to getting fresher, healthier air.

However, this 'psychology versus technology' antagonism will need to be resolved if people are going to trust in air systems and not default to a desire to open a window.

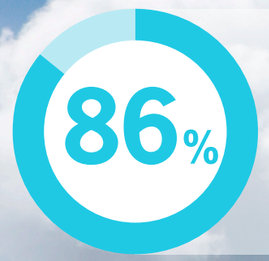
Visible measurement of air quality as per the monitors in each room at the Cordis Hongqiao might go a long way to proving both the effectiveness of a filtration system.

This certainly correlates with the views of the survey sample of which 88% said that air quality measurement at workplaces should become mandatory and one of the governing factors of the working conditions.

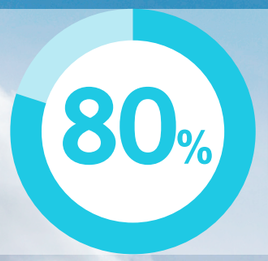
The survey indicates that employers have so far generally not yet been proactive in tackling the issue. Only 30% of respondents reported that their employer has taken measures to improve the air quality of their workplace. And these measures were extremely varied. Some employers had simply put more space between workstations with some even moving to larger buildings to make this strategy possible. Of the more positive comments, a respondent noted that their employer had added filters to the air conditioning units while another reported that air quality levels were now tested daily.

Whilst the debate on a proportionate response continues, those businesses who wish to see more of their personnel return to the office post-pandemic might particularly want to consider the fact that 80% of respondents said they'd feel more positive about a return to a five-day office week if air quality measurement and reporting was in place.

Air quality in the workplace

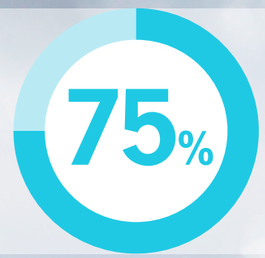


86% of UK employees surveyed said the quality of air in the workplace is more important following the pandemic.



80% of respondents would feel more positive about a return to a five-day office week with air quality measuring and reporting in place.

75% of respondents would rather open a window for ventilation than work in an air-conditioned building.



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80% of respondents would like more information about the quality of air in their workplace.

Source: JPES Partners/Pollfish

Meeting occupiers' expectations

22 Bishopsgate is the City of London's tallest building and is able to circulate fresh air throughout its 62 floors

If employers may have generally not been fast to appreciate the ramifications of changing attitudes to air quality, there are encouraging signs that the property sector is anticipating how these will influence occupier demand for space.

Just over three quarters of the space in CO:RE's 400,000 sq ft 20 Ropemaker Place project will have access to external balconies

Andres Guzman, Head of Sustainability at property consultants, Colliers, is emphatic on the subject: "Newly built assets are going to be judged on their indoor air quality, and it is not hard to imagine that healthcare professionals will be more involved in the design of assets and the services within them".

And the challenge is not just around new developments. Delivering good air quality also has to be factored into the life-cycle of existing assets. This retro-fitting may turn out to be one of the biggest challenges that the sector faces.

To address this, **Legal & General Investment Management** has teamed up with AirRated to provide indoor air certifications across 25 of its multi-let offices across the country.

Andrew Mercer, LGIM's office sector lead, commented: "We're keen for occupiers to have the sensors in their space, which will basically tell them what the air quality is, what the temperature is, and what the humidity is".

However, the growing focus on air quality is being most vividly illustrated by new projects.

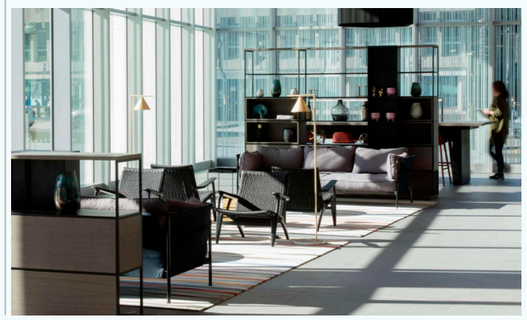
AXA IM ALT has recently completed 22 Bishopsgate – the tallest building in London – which encompasses more than 1.3m sq ft of space and, at full occupancy, will provide workspace for around 12,000 people.

Despite its height and complexity, it takes fresh air into various plant rooms up the building, and distributes it across its 62 levels. Whilst, in many respects, this is an ideal blend of fresh air and filtration, the process can be relatively energy intensive as it involves extracting moisture from the air intake.

Another new City of London office development – **CO:RE's** 400,000 sq ft 20 Ropemaker Place project offers a more direct approach to accessing fresh air. Just over three quarters of the space has access to external balconies together with more than 20,000 sq ft of terraces. In February of last year, law firm, Linklaters, signed a prelet for more than 300,000 sq ft of the building – the largest Central London letting in 2020.

Ashby Capital and **U+I's** 100,000 sq ft Future Works office scheme in Slough is becoming the first property in the UK to secure a platinum AirScore certification from AirRated.

Occupiers can scan QR codes throughout the building to see details of the building's AirScore, and how the design and management of the delivers a consistently healthy and productive space to work.



Ashby Capital and U+I's 100,000 sq ft Future Works office scheme in Slough is becoming the first property in the UK to secure a platinum AirScore certification

In Poland, the **Olivia Business Center** in Gdansk uses 'needlepoint bipolar ionisation' to cleanse the air. The technology works in combination with the ventilation system by saturating occupied areas with ions that eradicate viruses, bacteria and other pathogens. It is the same technique used in the White House and in private Gulfstream jets.

The process removes 99.4% of viruses and bacteria as well as eliminating unpleasant odours, it also removes dust, and mould and fungus spores from the air that can cause breathing difficulties.

Active titanium coatings have also been applied to surfaces in lifts, receptions and parking areas. The coating, which lasts for at least 12 months helps eliminate pathogens such as bacteria, fungi and viruses by breaking down their residues into carbon dioxide and water. Changes to the operation of the building's lifts mean that, when in stand-by mode, the lift doors remains open allowing fresh air to enter.

In the residential sector, **SearchSmartly** recently became the 'world's first' housing website to display local air quality ratings on all of its listings.

And air quality is also being looked at for public domains: **Grosvenor Europe** has launched an air quality monitoring scheme across its Swedish retail portfolio for the benefit of those who work and come to shop in the properties.

Meet the air police

In September 2021, the Institute of Air Quality Management published new Indoor Air Quality Guidance.

The guidance has been produced to assist its members in the assessment of indoor air quality and is applicable to new and existing buildings of all types including residential, commercial, retail, education, healthcare and community facilities.

Given the speed with which the issue is rising on the workplace/wellbeing agenda, there is a growing group of new businesses and consultancies which aim to provide practical help and also grade air quality.

In terms of establishing a property sector standard measurement rating, **AirRated** with its AirScore measure are prominent in the space. It provides certification for Indoor Air Quality (IAQ) using sensors which collect detailed information about a building's indoor air quality, then grade it based on leading medical research and industry best practice. This process determines a building's AirScore, which can range from 'certified' to 'platinum' ratings.

To achieve a score, AirRated carries out a three-week environmental survey which gathers information about your building's indoor air quality. Data from outdoor environmental monitoring stations is also analysed and taken into consideration, as this can have a significant impact on the internal air quality.

Once the data is collected, AirRated tests these data sets against the AirRated scoring system, to generate your building's AirScore. The AirScore consists of five fundamental parameters. The three most impactful (PM2.5, CO2 and TVOCs) must each meet a mandatory minimum threshold requirement for 95% of survey hours in order to pass and become 'Certified'. A report is then provided with a detailed analysis of the building's indoor air quality together with any suggested remedial actions.

The tiers of AirRated's air quality rating are:

Platinum AirScore	9.0-10
Gold AirScore	8.5-8.9
Silver AirScore	8.1-8.4
Certified AirScore	6.0-8.0

Other new entrants into the space include **Evotech Air Quality** which, in partnership with Norwegian tech company, Airthings, provides building owners and managing agents, with indoor air monitoring solutions that effectively measure the levels of CO2, humidity, temperature, particulate matter, volatile organic compounds (VOCs) and Radon, to provide clear and demonstrable evidence of the IAQ within buildings.

Where results are poor, improvement measures can be implemented to reduce indoor air hazards, optimise ventilation, and better control heating and cooling systems, whilst reducing energy consumption and carbon emissions.

Smart Spaces, the smart building system company, has launched sensors aimed at improving the indoor air quality in buildings. Its IAQ Smart Sensor can detect the most common compounds in the air and prevent dangerous levels from being reached with the use of round-the-clock monitoring and notification of the indoor conditions.

A fresh approach

To date, most air quality regulation has focused on external environments and the pollution generated by everything from cars to cows. Going forward, we can expect far more emphasis on the air inside of buildings instead of that which surrounds them.

This will undoubtedly present a challenge particularly for existing buildings that will need to be adapted if they are to meet higher expectations around air quality.

For new development, the issue is perhaps more straightforward but for both types of asset – new and old – there is likely to be an additional layer of cost as more intensive and sophisticated systems have to be put in place.

From a more positive perspective, engaging with the issue can contribute to the marketability of a property and its long-term asset value. Air quality assurance is already taking its place among the selling points for space.

As the results of our survey show, there is clearly a demand for more information about air quality and this can become a positive channel for occupier engagement and also influence the wider conversation around workplace sustainability and wellbeing.

In this context, addressing air quality will become another factor to consider in our collective journey towards to net zero carbon status in 2050. And what is clear is that the answer to this challenge will not always be to just open a window.

REPORT AUTHOR

Stephen Collins
Client Manager

+44 (0)20 7520 7628

stephen.collins@jpespartners.com

JPES Partners is a communications, content and marketing consultancy for the asset management and property sectors.

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JPES Partners
4 Coldbath Square
London EC1R 5HL

+44 (0)20 7520 7620
info@jpespartners.com
jpespartners.com