

Inside story

Indoor air quality and its effect on health has become a major talking point for the HVAC industry. *H&V News* recruited experts across the supply chain for its first Question Time to debate the way forward

/ BY IAN VALLELY

The quality of the air we breathe is headline news. Some of the tabloid stories are deeply disturbing: “Air pollution will kill 200,000 people in the UK in the next five years”; “Report reveals one in eight UK towns and cities have dangerously high air pollution levels”; “Air pollution to blame for a third of strokes, say experts”.

Others are outlandish: “Man sells British fresh air to wealthy Chinese elite for £80 a jar”; “Ghost sightings might just be hallucinations caused by breathing toxic air, say scientists”; “China smog so bad that the daily sunrise is broadcast on giant TVs for residents who can’t see it”.

But whether they’re profoundly scary or just plain bizarre, headlines such as these demonstrate a growing awareness of the vital importance of good air quality to our health and welfare.

Although many of the stories in the national press concentrate on outdoor air pollution, the health impacts of indoor air can also be dramatic, according to Simon Birkett, chief executive of pressure group Clean Air London.

As keynote speaker at a recent packed *H&V News* Question Time event in London on indoor air quality (IAQ), he pointed out: “Indoor air pollution is a mixture of outdoor air coming in and emissions from indoors. We need to care about this

because we spend 90% of our time, on average, inside buildings and about half to three-quarters of indoor air pollution comes from outside.”

It was, however, Kelly Butler, deputy CEO of BEAMA, who set the scene in his opening address: “We are seeing an increased propensity for mould and damp, and a growth in volatile organic chemical (VOC) levels.

“One study showed that if you increase the performance rating of a building in SAP and don’t ventilate properly, then you have a higher incidence of asthma. The evidence is starting to be compelling and the interest of the population is growing.”

Raising awareness

Responding to this, the ventilation sector has organised a campaign, now in its third year, called My Health My Home, designed to boost public awareness of IAQ.

Mr Butler explained: “We decided at the outset that we wouldn’t run the campaign as BEAMA, but rather we would be the catalyst for it, collecting the funding from industry, organising the agencies, and being part of the recruitment of professionals and experts in the health area to work with us... the idea was to get the awareness out there, not talking about solutions, but focusing on IAQ.”

The campaign’s website (www.myhealthmyhome.com) contains a wealth of information about IAQ,



Andy Mudie



John Kelly, Peter Rankin, Lee Nurse



Simon Birkett

including case studies, expert advice and an interactive questionnaire that enables people to rate the health of their home.

But it's not the only IAQ initiative. The All-Party Parliamentary Group on Healthy Homes and Buildings, sponsored by BEAMA, set up in May, plans to highlight the health and cost

benefits of constructing buildings and homes to the highest levels of comfort (including IAQ) and energy efficiency.

So, air quality – both outdoors and indoors – is now firmly established as a mainstream issue. And it has significant political backing, which will help shift regulatory levers. But, warned Mr Butler: “If we don't ensure a healthy

Fast fact

5.2m
people in the
UK suffer from
asthma

supply chain and procurement/design process, we may not be able to respond to these regulatory levers.”

There are many sources of poor indoor air – volatile organic compounds, formaldehyde, radon gas, carbon dioxide, carbon monoxide, and pollutants from chemicals such as cleaning products and pesticides. For Andy Makin, managing director of EnviroVent, however, one of the most important contributors to poor IAQ is condensation.

He pointed out: “One in five UK homes in suffers with condensation and mould problems. It is not just a problem for new-build, as we build tighter and tighter, but it is a big problem in the millions of homes outside the building regulations in the UK – around 20 million homes.

“This is a huge opportunity for our industry. Our task is to get this message across.”

PANELLISTS

- | | |
|-----------------------------|----------------------|
| Kelly Butler | BEAMA |
| Andy Makin | Envirovent |
| Andy Mudie | Nuaire |
| John Kelly | Airflow Developments |
| Lee Nurse | Vent-Axia |
| Peter Rankin | DCLG |
| Simon Birkett | Clean Air in London |
| Giuseppe Borgese | Bouygues E&S |
| Tim Rook | BESA |
| Blanca Beato-Arribas | BSRIA |

/ IAQ Question Time

Fast fact

Indoor concentrations of some pollutants can be higher than outdoor (10 or 20 times higher in the case of formaldehyde)

It is a message with several potential recipients, including clients, consultants, manufacturers and end-users. For John Kelly of Airflow Developments, the most important recipients are installers because better ventilation is only possible if installers are trained effectively: “Modern sealed houses mean the issue of indoor ventilation, how effective it is and how well it’s installed, becomes even more critical. Are ventilation practices really keeping pace with this?”

He said there were many examples of good-practice design and commissioning of ventilation systems: “However, we do find that the level of competence of installers has varied quite a lot and that seems to be backed by independent research on the variability of installation. One of the last reports by the Zero Carbon Hub was a trial of housing properties and ventilation in new homes, and they found lots of issues, with installation key among them (see *H&V News*, May).

“And, just this year, the Mackintosh Environmental Architectural Research Unit undertook a study of more than 200 dwellings in East Kilbride and discovered major issues with

installation and the lack of knowledge of the people who carry out this work.”

To address the issue of competence, BEAMA, with its ventilation group members, is introducing a competent persons’ ventilation installer training scheme. Mr Kelly explained: “Ventilation courses already exist, but they tend to be over two days and there is no real follow-up.

“This will be an audited scheme very much like [the Gas Safe Register] in the gas industry. This scheme is going to be run by NICEIC. It will give ventilation installers a qualification and a high level of skills, which gives everybody else confidence that they are installing systems correctly.” (See p39.)

But it’s not just installers who need training and education, according to Clean Air in London’s Mr Birkett. He said that investigations by his own organisation had revealed that many local authorities don’t know if their schools use air filters and few hospitals comply with indoor air standards. This was something that needed to be addressed urgently.

There is also a need to educate business managers in commercial buildings. As BSRIA’s Blanca Beato-Arribas said: “I think the



Andy Makin

body responsible for providing good IAQ is your employer. I think it’s important for people to start pushing their employers because, by law, they are responsible for their employees’ welfare.

“[We need to act now] unless, 40 years from now, we want to see something similar to what has happened with asbestos – people suing because they worked in a dangerous environment and no one did anything about it.”

RECENT IAQ REPORTS

There is growing evidence that IAQ has a dramatic impact on people’s health. Here are some recent publications that add further weight to the argument:

- *Ventilation in New Homes* – Zero carbon hub (which closed at the end of March 2016): There is evidence of poor design, installation and policing, and training is not robust enough [bit.ly/1rwhOVS]
- *Every Breath We Take* – Royal College of Physicians: 40,000 people are dying in the UK every year due to air pollution [bit.ly/1PUBD09]
- *The Future of IAQ & its Impact on Health* – BEAMA: Asthma could increase by 80% from current levels [bit.ly/29Qbamz]
- *Research Project to Investigate Occupier Influence on Indoor Air Quality in Dwellings* – Mackintosh Environmental Architecture Research Unit: [bit.ly/1SUH9EK]
- *House of Commons Environment, Food and Rural Affairs Committee – Air quality*: Despite mounting evidence of the costly health and environmental impacts of air pollution, we see little evidence of a cohesive cross-government plan to tackle emissions [bit.ly/1TwZ9IC]



John Kelly



Giuseppe Borgese

Regulations and legislation

Simon Birkett of Clean Air in London is keen to ensure that air quality laws are enforced rigorously in London. He said: "It is a truly great time to be an air pollution campaigner. At the end of last year we had the Paris agreement, last year at the 68th meeting of the world health assembly they debated air pollution for the first time and this year at the 69th meeting they have endorsed a plan by the world health organisation to tackle air pollution. And Sadiq Khan, by his fifth day as London mayor, did more for air quality in London than Boris Johnson did in eight years."

The main legislation for IAQ, however, is Part F, which deals with



Jennie Smith

ventilation requirements in the building regulations. Peter Rankin of the Department for Communities and Local Government (DCLG) looks after it. He said: "Part F is a hugely important piece of policy. It was originally devised to look at simply moisture build-up in buildings, but since then it's evolved and expanded to become a set of standards about occupant health in buildings.

"The direction of travel for this government has put a strong focus on deregulation and reducing regulatory burdens for housebuilders, but at the same time there has been a growing understanding of ventilation and its health effects, particularly in the home."



Blanca Beato-Arribas, Tim Rook

COMPETENT INSTALLERS

There is no shortage of technical information on air quality. Tim Rook of BESA said: "There is the Clean Air Act technical memorandum governing emissions from combustion appliances, there are standards on the location of ventilation, there is a whole list of British Standard numbers that apply to emissions from glue laminated timber – we are not short of technical information, or the knowledge of how to apply it. The problem really is getting it applied properly and holding people accountable for the application."

The ventilation sector is addressing the question of competent installers with a new scheme involving BEAMA, NICEIC and Certsure comprising two elements – training in processes and procedures, and auditing whereby a company becomes verified and is inspected once or more times a year to see that products are being correctly installed [for more information, see p39].

Authorised installers

Airflow Developments' John Kelly explained: "An individual takes the course and has to pass it. They then go back to their company and are the recognised competent installer. The company accepts the fact that it will be audited with visits from NICEIC.

"The installer team can go out and install the product, but the individual who is trained and qualified has to sign that off on behalf of the company.

"So you don't train everybody, but you will have an authorised installer who will check off the work that's been done. The company will be visited, and their records, documentation and installations will be checked."

Vent-Axia's Lee Nurse added: "You have to put into context the importance of installation in relation to performance. At the moment, within SAP you have the capacity to get better performance installation by ticking a box, in effect, in the software, which says a competent person has installed it.

"The new course from the NICEIC is a far more robust process-driven way of measuring the installation. If you join that scheme, when you take the tick box in SAP that says the installer is competent, he or she actually is.

"If we can see an improvement in membership of competent person schemes, then the capacity to get SAP to deliver better efficiencies in ventilation will be improved."

/ IAQ Question Time

Fast facts

Air filters can protect us from 90% of air pollutants for up to 90% of the time

The average year-on-year growth of MVHR is 16% versus a 5% increase overall in ventilation systems

The average four-person household produces 16 pints of moisture each day, potentially contributing towards condensation problems

IAQ IN QUOTES

"The shift in public and industry opinion on IAQ has been startling over the past year or two. We [at BEAMA] made a conscious decision with our industry partners to focus on... the impact of poor ventilation design on the health of individuals."

Kelly Butler, BEAMA

"At least one in five homes in the UK is affected by condensation and mould – and that is a real trigger for a lot of the health problems that relate to IAQ."

Andy Makin, EnviroVent

"We can see changing legislation driving more and more energy-efficient homes, and there is almost certainly a relationship between energy efficiency and the impact that has on health."

Lee Nurse, Vent-Axia

"We need to strike a careful balance in Part F, particularly when it comes to mechanical ventilation systems, so that we don't end up putting in ventilation rates that are too high."

Peter Rankin, Department for Communities and Local Government

"EH40 [Workplace exposure limits] from the Health and Safety Executive sets the exposure limits of certain contaminants at work. But people do not really measure for IAQ."

Blanca Beato-Arribas, BSRIA

"We need a holistic approach to IAQ in order to join up the design and the reality. We have architects and consultants designing systems to a certain performance, but they sometimes fail to match that on site."

John Kelly, Airflow Developments

"We are starting to see a distinct link between IAQ and outdoor air."

Andy Mudie, Nuair

"There should be long-term periodic maintenance [of the ventilation system]. BS780 does specify periodic inspections of the entire system and then you act on what you find... However, I find that some areas are never inspected."

Giuseppe Borgese, Bouygues E&S

"We have talked a lot about when you build a new home, you can put the systems in which can include filters, but with refurbishment that is much more difficult. You don't have the luxury of being able to fit whole systems."

Jenny Smith, Vent-Axia



In 2010, the government we made some changes to Approved Document F and to Part F, inserting a new set of standards for more airtight homes and placing requirements on installers for commissioning and measuring airflow rates from mechanical ventilation systems. DCLG is currently undertaking research to look at the effectiveness of those changes.

Mr Rankin said there was a balance to providing good ventilation: "The last thing that we want is to have regulations that look very good on paper, but, in reality, people turn off their fans because they are too draughty or too noisy. Before making any changes to the Approved Document we will engage with industry to make sure that we don't have standards that are inappropriate or unworkable."

Vent-Axia's Lee Nurse added: "We must be careful that we don't get obsessed by regulation. Part F only influences new-build on any sizeable scale, yet 95% of the buildings that will be here in 2050 are already built."

BSRIA's Blanca Beato-Arribas saw another issue with Part F: "It says you have to provide an adequate means of ventilation, but buildings are not really inspected so, at the moment, I think there is a need for the occupants of the space to be the ones that push for good IAQ."