

Air-con's last gasp David Strong

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As the great Monty Python sketch writers might say, air-conditioning is dead. It's no more. It has ceased to be. It has kicked the bucket, shuffled off its mortal coil, run down the curtain and joined the bleedin' choir invisible.

Although I'm afraid to admit, that's not quite accurate! Particularly since air-conditioning has grown its market in commercial buildings and even homes very rapidly over recent years.

But the future is looking decidedly dicey for an energy-intensive, high maintenance technology that strictly speaking is no longer required for new buildings in the UK, even in the face of global warming and the associated climate change.

One of the first potential nails in the coffin was the announcement earlier this year by the British Council for Offices that they had updated their Guide to Specification to address sustainability. The previous 2005 specification had been heavily criticised by many in the property sector as it implicitly recommended four pipe fan-coil air-conditioning systems and contained a requirement that office buildings should be designed to achieve internal summer temperatures of 22°C, with a very narrow control band of +/-2°C. This made it virtually impossible for designers of naturally ventilated, or passively cooled, buildings to comply.

The 2009 Guide has relaxed the internal temperature requirement to 24°C for air-conditioned offices. However, and most important, it has introduced a new design target for mixed mode and naturally ventilated offices of not exceeding 25°C for more than 55% of the occupied hours and 28°C for no more than 1%. This is a very pragmatic and sensible change, since it now makes it possible to deliver much more energy efficient buildings without resorting to full air-conditioning.

Explicit references to specific systems have also been removed. As a consequence, we are likely to see many more of the next generation of office buildings adopting a mixed-mode approach to cooling and ventilation, and probably much greater use of free cooling systems.

My own consultancy is already busy talking to clients keen to know about these systems. Of particular interest to us is the potential offered by ground-coupling (NB not to be confused with ground source heat pumps). This is a way of cooling air in the summer (and pre-heating in the winter) by passing it through underground ducts and utilising the thermal mass of the earth. This delivers free cooling in the summer, without the need for large areas of high embodied-carbon exposed concrete. They have been specified at more than 200 office buildings in Germany already - expect to see this greener technology in an office near you sometime soon.

There is also a growing interest in evaporative cooling (also known as adiabatic cooling). The principles of evaporative cooling were used by the Persians centuries ago and is still used in many traditional Arab buildings. This is, arguably, still air-conditioning, but it gets rid of the need of refrigerant based mechanical refrigeration and allows us to make use of a much more efficient and carbon neutral technology, at very low operational and maintenance cost, albeit with a small additional water demand.

That's all very well and dandy, you may say, but where's the regulatory driver for these changes? Is it too soon to announce the demise of air-conditioning?

Possibly, but it looks as if a coup de grace will come from the new Part L regulations for 2010. One of the most significant changes will be the closing of the loophole, which has in the past made it easier for fully air-conditioned commercial buildings to demonstrate Part L compliance than their more energy efficient counterparts.

It seems very likely that the new Part L2A requirements will contain a tougher improvement factor for air-conditioned buildings, which will address this anomaly. As a consequence it will become considerably more expensive for an air-conditioned building to achieve Part L compliance from next year.

This is good news for achieving improved environmental sustainability in the built environment. Occupants will be happier - passive natural ventilation can easily be provided without opening windows or sitting in draughts. It should not cause headaches for developers or designers either. Architects are already much more experienced at designing buildings that exploit orientation, shading and ventilation to overcome summertime overheating. Internal temperature gains are reducing too with the development in better IT systems and the return to centralised servers, often located offsite. We can also enjoy improved daylight controls and more efficient lighting that doesn't generate lots of excess heat.

All we need to do now is to wean the world's architectural celebrities off of their obsession with fully glazed 70 storey skyscrapers and call time on artificial ski-slopes in the desert.