

Press Release
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SE Controls Explains the Case for Natural Ventilation

The bringing together of [adaptive natural ventilation](#) control systems as used on glazed facades can offer huge benefits to building owners. Automatic window actuators responding to CO₂ and temperature sensors can ensure the purging of CO₂ along with motorised solar shading louvres linked to sun direction that can keep solar gain under control.

These 'intelligent' facades are now being specified making public and private building more sustainable. Simple and effective natural ventilation is the answer for all our new buildings.

The Need

With rising energy costs and rising CO₂ levels [natural ventilation](#) has made a strong comeback in the last few years, but there is a complex science behind providing competent systems for various building shapes and intended uses. The use of natural ventilation solutions can drastically reduce CO₂ emissions. Up to 50% of all the energy we consume is used in the buildings in which we work, play and live in.

It is well known that one of the main areas of energy consumption within our existing building stock is mechanical heating and cooling systems. A well designed and installed air conditioning system can offer very effective internal ventilation and temperature control, but this comes at an environmental impact which is increasingly questioned in terms of both cost and CO₂ emissions. With clients under ever greater pressure to reduce costs in business, buildings with great performance such as BREEAM 'excellent' or even 'outstanding' ratings are increasingly attractive.

Maintenance costs over the life of a building can far outweigh the initial capital cost and if [maintenance](#) can be reduced, cost savings can be significant. Air conditioning, incorrectly and poorly maintained, can bring on the effect known as 'Sick Building Syndrome', or even create a breeding ground for serious diseases. Well designed natural ventilation systems virtually eliminate this risk and require far less costly maintenance. If a client decides to apply the 'if it ain't broke don't fix it' model, maintenance issues are usually immediately obvious. The same can rarely be said for convoluted air handling systems.

And as financial pressure to redevelop rather than rebuild increases, older buildings become the target for redevelopment. This is a strategy in itself resulting in a smaller carbon footprint, and when combined with [natural ventilation](#) solutions, this provides the key to ongoing sustainability.

Improving Productivity

In schools it has been proven that natural ventilation systems can effectively control levels of CO₂ within classrooms; low levels of CO₂ are conducive to an active mind and aid the learning process. The same is true for any areas where people work and learn such as offices, libraries, and government buildings. In hospitals, fresh air provided through [natural ventilation](#) can help in controlling infections far more intuitively than relying on complex often poorly maintained air conditioning through filters, ducts and mechanical plant which can house and distribute infections.

Procurement

All buildings whether new or refurbished are usually unique and therefore before any [natural ventilation](#) design can be proposed, thorough consideration must be given to many factors from building location and orientation, thermal mass and internal heat gains, through to intended use and occupant density and distribution profiles. Clearly, consultation at project concept design stage is therefore essential.

Challenges

It's not just the short term layout intent that should be considered; businesses go through regular restructuring phases especially in a turbulent economic climate. Offices spaces must accommodate these frequent changes, often with partition walls being moved as departments resize or relocate. Inevitably this affects the performance of building services including ventilation, as changes in IT equipment and staffing levels affect internal heat gains, requiring [adaptive natural ventilation](#) control systems to mitigate these factors.

Many design solutions can be proposed for additional ventilation in an existing building. One popular concept is the use of existing risers and stairwells to provide ventilation stacks with high level exhaust; use of this stack ventilation principle draws fresh air into the building through synchronised [automatic vents](#) at lower levels.

Hospitals present many challenges for natural ventilation. Currently using adaptive facades is most common in atria spaces, where large automated triple height facades can provide an excellent environment for the hospital's hub. Such facades will provide solar control, [smoke ventilation](#) and natural comfort ventilation, synchronising with BMS systems and providing safe automatic operation where children and other vulnerable people are present. Building Bulletins set out various requirements for indoor air quality and thermal comfort; currently high temperatures within schools are permitted only for certain time durations (120 hours over 28°C per year), with a maximum daily average CO₂ exposure of 1500ppm. The Building Bulletins advocate the use of natural ventilation in learning spaces to help achieve these levels and thus ensure best learning productivity; an increase of 5% productivity can be the difference of a student achieving a pass or fail at the end of the year, and who wouldn't want that for their children?

[SE Controls](#) has over 30 years experience providing adaptive solutions that met the design intent and ventilation strategy on thousands of projects. More information on systems and services can be found at www.secontrols.com. To discuss a requirement with SE Controls, or to request a copy of printed literature, please call the head office in Lichfield on 01543 443060.

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