

**Over 90% of office workers would rather be served by natural ventilation systems, so why is it not normal practice?**

**Many architects and consultants argue that serious technical difficulties make it impossible to implement widely**

# BRE team attacks 'barriers' to natural ventilation

**A** European NatVent project force led by BRE, due to report next year, has found that technical barriers to natural ventilation can be overcome right now and installation, maintenance and running costs can be reduced substantially.

The project force is monitoring three large town centre buildings in the UK and a range of similar buildings throughout Europe. A survey of building owners in seven countries found that the perceived barriers to natural ventilation are:

- summer overheating;
- control of pollution;
- inconsistency of the weather;
- recovering heat from waste air;
- Integrating natural and mechanically based systems.

***“Running costs are as much as 30% lower”***

Earle Perera, who leads the UK coordinating team from BRE, believes the project group already has the answer to each of these problems. During the next year it is planned to have products on the market, design guidance published and a Europe-wide awareness campaign.

Taking ventilation air from first floor level at the back of a building alone drops pollution levels to below 33%. A further drop is created by the reservoir of fresh air in a naturally ventilated building diluting the pollutants. The Norwegians have solved the resulting problem of heat recovery from waste air by improving existing heat recovery devices.

“Our Dutch partners”, says Mr Perera, “have patented a product which increases

and decreases the size of the air intake depending on the weather conditions. The same use of electronics allows some parts of a building to be naturally ventilated while others such as the toilets remain mechanically ventilated. Equally, electronics enable the amount of cool air needed during heat waves to be predicted so that sufficient cool air can be distributed around a building at night to make it more tolerable the next day.

“By next year, we will have collated these and other innovations and produced user friendly design tools to help developers and their architects and engineers decide at an early stage in a building project if, and how, the commercial and technical advantages of natural ventilation can be obtained.”

## Survey

■ It has long been a popular belief that building occupiers prefer natural ventilation to air conditioning as a means of bringing fresh air and cooling into office spaces. This belief was confirmed recently when an important survey of users by the international firm of property consultants, Richard Ellis, found that over 90% of respondents prefer naturally ventilated offices.

Architects and building services engineers continue to argue that pollution from noise and dirt, and the problem of the variability of the weather, make widespread use of natural ventilation impossible.

Perhaps the major motivation for moving natural ventilation up the priority list however is the project group's findings on the economics. Not only does it appear to be cheaper to install and to take up less room, so saving on the cost of providing non-rentable space, but savings of some 20-30% on the running costs have also been projected.

Helping the researchers gain such information are the numbers of large, town centre, naturally ventilated buildings already in existence. These tend to have been built

because the owners wished a project to have a “green” image but, nevertheless, they provide a ready-made test bed for new ideas and for monitoring what happens in real life. There are at least six such buildings in the UK alone, three of which are being monitored in depth by the project team. Elsewhere in Europe, teams are investigating examples of older buildings that have been refurbished with natural ventilation and of smaller, suburban, office buildings.

On the experimental front, the Technical University of Delft has been working on the idea of night cooling. The problem it has chosen to tackle is that heat waves only occur every now and again and yet one has to build sufficient, and expensive, air conditioning into a building to cope with this worst case. But, if one was able to “flush through” a building at night to take out the heat that built up during the day, then the need for extra air conditioning would disappear.

Delft has found this to be an entirely feasible proposition and is monitoring built examples. Again, it is the electronics that make the system work. Self-learning and predictive controls decide how much air is needed, and for how long, to be fed through a building at night in order for the comfort conditions in the morning to be within the acceptable comfort tolerance and yet to be cool enough to allow the building's fabric to soak up the next day's heat wave.

Back at the BRE, Mr Perera's team is now collating these and other innovations and is building them into simple-to-use design tools to help developers and their architects and engineers decide at an early stage in a building project if, and how, the commercial and technical advantages of natural ventilation can be obtained.

On the basis that office workers are more productive if they are happy and comfortable, then natural ventilation looks to have a bright future. ■