NatVent  A better way to work
Overcoming barriers to natural ventilation

Co-ordinator
Building Research Establishment (Great Britain)

Contractors
Belgian Building Research Institute
Danish Building Research Institute
TNO Bouw, (Netherlands)

Associated Contractors
AB Jacobsen & Widmark (J&W) (Sweden)
Technical University, Delft (Netherlands)
Willet Building Group (Great Britain)
Norwegian Building Research Institute
Solar Infra Laboratory (Switzerland)
The project
NatVent is a European project which is being carried out by a consortium of nine partners, across seven countries - Great Britain, Belgium, Denmark, the Netherlands, Sweden, Norway and Switzerland. The work, which is being co-ordinated by the Building Research Establishment, will achieve three major tasks. It will:

**Identify barriers:** perceived barriers are being identified through an in-depth study amongst leading designers, architects, building owners and occupants

**Assess current practice:** the environmental/performance parameters of buildings are being monitored to provide case studies

**Provide solutions:** 'smart' natural ventilation technology systems and component solutions will be developed to overcome the identified barriers.

The benefits
Recent surveys indicate that 90% of building occupants prefer naturally ventilated buildings. Naturally ventilated buildings provide benefits for owners, occupiers and the environment.

**Save money**
- naturally ventilated buildings typically consume less than half the energy consumed in air-conditioned buildings
- operating costs are 40% less in terms of energy
- initial capital costs are cheaper by about 15%
- costs are spread over a longer life-time period
- less space is required for plant rooms and service distribution
- maintenance costs are 75% lower

**Improve productivity**
- fewer incidents of sick building syndrome are reported
- occupants have control over their immediate environment
- productivity and comfort are enhanced

**Be environmentally sound**
- minimise emissions of the greenhouse gas carbon dioxide (CO₂)
- avoid using ozone-depleting substances.
Breaking down barriers and providing solutions

Misconceptions surrounding natural ventilation are impeding its take-up by architects and developers in and around Europe. As a result, many building owners and occupants are missing out on the benefits that it provides - benefits that range from the financial to those concerning health, comfort, productivity and the environment.

If this situation is to be corrected, the market needs to be convinced of the viability of natural ventilation and be confident that generalised and tested solutions to technological barriers are available. NatVent will do just this. It is studying the issues involved and providing the technology and guidance that will promote take-up amongst those who might otherwise contemplate air-conditioning.
Natural ventilation - a better way to work

Identifying barriers

Perceived commercial, institutional and technical barriers are being identified through in-depth structured interviews with leading designers, architects, building owners and developers in seven European countries. The results will be summarised in individual national reports and a common, final report.

The national reports will describe the knowledge, viewpoints, experience and perceived problems in each country as well as decisions actually taken in specific building projects. There will be a short explanation showing how building regulations, occupational health regulations and other standards may appear to impede uptake of natural ventilation, together with a description of typical ventilation systems.

The final report will summarise the national reports, identify common problems, highlight solutions used to date and give recommendations on how to overcome the identified barriers.

To get a picture of current practice in Europe, NatVent is monitoring a number of buildings across the seven participating countries and compiling case studies of these. The buildings provide good examples of natural ventilation application and represent a balance of retrofit and new build, of typical designs and more sophisticated strategies.

The advantages and shortcomings of purpose built, naturally ventilated buildings will be identified and the required conditions will be set out for achieving successful natural ventilation systems. In particular, the study will consider the control of indoor air quality, the control of summer thermal comfort and the prevention of overheating.

NatVent will provide the market with a number of practical solutions which will take the form of 'smart' technology systems and component solutions. There will be a guide book describing the solutions and showing how they can be applied in an integrated method for year-round occupant comfort. The information will cover five major topics.

Solutions will be developed for effective filtration of particulate matter, air pollutants and noise. Guidance will be published on the requirements, performance and availability of filtration systems.
Guideline values for the parameters associated with indoor air quality will be provided together with a report on the requirements and performance of constant but controlled air flow inlets. Solutions will be specified and benefits demonstrated through a series of workshops.

Existing systems will be evaluated and will include design and cost considerations. Advanced systems suitable for office-type buildings in cold climates will be developed and tested.

A state-of-the-art review will be prepared covering the availability of hardware suitable for night cooling and the benefits and limitations of control strategies. Suitable control systems, including adaptive algorithms will be designed.

A robust, user friendly, interactive design model will be produced incorporating all the above technologies. Maintenance and the cost of optimum year-round use will be addressed.

For more information

If you would like more information about the NatVent project, its findings and solutions, please contact:

Dr Earle Perera
Building Research Establishment
Garston
Watford
Herts WD2 7JR
Great Britain
Telephone: + 44 (0)1923 664486
Fax: + 44 (0)1923 664796
e-mail: pererae@bre.co.uk.
NatVent

Overcoming technical barriers to low energy natural ventilation in office-type buildings in moderate and cold climates

Participants

Maria Kolokotroni, Vina Kukadia & Earle Perera*
Environment Group
Building Research Establishment
Garston
Watford WD2 7JR
Great Britain
Tel: +44 1923 654466
Fax: +44 1923 642966
e-mail: pererae@bree.co.uk

David Ducema & Peter Wouters*
Belgium Building Research Institute
Rue de la Violette 21-23
1000 Brussels
Belgium
Tel: +32 2 653 8864
Fax: +32 2 653 0729
e-mail:wouters@bbri.be

Soren Agersholm* & Niels C Bergsoe
Danish Building Research Institute SBI
Energy & Indoor Climate Division
PO Box 198, DK-2970, HøRenholm.
Denmark
Tel: +45 42 86 65 33
Fax: +45 42 86 75 55
e-mail:sso@sbri.dk

Willem de Girs
TNB Building & Construction Research
Department of Indoor Environment
PO Box 29, 2600 AA Delft
The Netherlands
Tel: +31 15 2 60 84 72
Fax: +31 15 2 60 84 32
e-mail: wdegirs@bouw.tno.nl

Johnny Kronwall* & Charlotte Svensson
AB Jacobson & Wiemak (J&W)
Slaghusset
S-2120 Malmo
Sweden
Tel: +46 48 40 108226
Fax: +46 48 40 108226
e-mail: johnny.kronwall@malmo.jcowid.se

Ake Blomsterberg
Swedish National Testing & Research Institute
Tel: +46 33 165005
Fax: +46 33 131973
e-mail: ake.blomsterberg@sp.se

Hong Lien & Dolf van Passen*
Delft University of Technology
Lab. of Ref. Eng. & Indoor Climate Tech.
Mekelweg 2, 2628 CD Delft
The Netherlands
Tel: +31 15 276 6675
Fax: +31 15 276 7294
e-mail: ake.vanpassen@wbmt.tudelft.nl

Paul Ajiboye, Mark Hesketh & Peter Willan*
Willan Building Services
2 Brooklands Road
Salford
M33 3SS
Great Britain
Tel: +44 161 973 1264/6282
Fax: +44 161 969 5345
e-mail: peterwillan@willan.co.uk

Peter Blom, Jan Brussell* & Einmund Skarret
Norwegian Building Research Institute
Forskningsveien 3B
PO Box 123, Blindern
N-0314 Oslo 3
Norway
Tel: +44 22 96 5510
Fax: +44 22 98 5725
e-mail:jpm.brussel@byggforsk.no

Rene Cutting & Peter Kofod*
Sulzer Infra Lab Ltd
Zuricherstrasse 48
8401 Winterthur
Switzerland
Tel: +41 52 262 4765
Fax: +41 52 262 6902
e-mail: renecutting@dial.aurenet.ch

Expert adjudicator
Martin Liddament
Air Infiltration and Ventilation Centre
University of Warwick, Science Park
Sovereign Court
Sir William Lyons Road
Coventry CV4 7EZ
Great Britain
Tel: +44 1203 692050
Fax: +44 1203 416505
e-mail: liddament@avc.org

European Commission Scientific Manager
Georges Deschamps
Commission of the European Communities
DG XII F. JOULE Programme
Rue de la Loi 200
B-1040 Brussels
Belgium

*Asterisk indicates the lead contact.

© NatVent Consortium