

# Natural Ventilation

Fresh air – simple and efficient

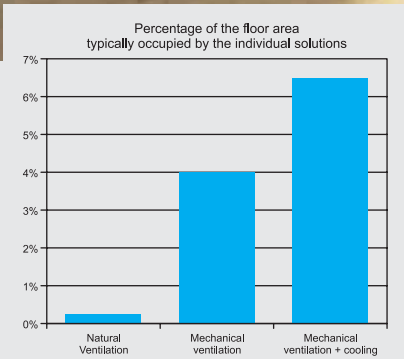
- A major benefit to
- ▶ Architects
  - ▶ Users
  - ▶ Environment
  - ▶ Building owners

# Light, airy and spacious buildings without constraints

A benefit to Architecture



NCC Denmark · Architects: Schmidt, Hammer & Lassen (Left and front page)



## ▲ New opportunities for the architect

Releasing the ties to mechanical ventilation systems creates new opportunities for opening the building to natural light, fresh air and spaciousness. Without ventilation pipes the room height can often be increased by half a metre, resulting in a better indoor climate and a more spacious feeling. Exploiting the forces of nature provides new opportunities and challenges for the architect. Natural Ventilation should ideally form a part of the project from the very early stages of concept and design.

## ▲ More space for more user satisfaction

With Natural Ventilation a lot of space is saved in the building. Experience shows that a mechanical ventilation system typically occupies 4-7% of the building's floor area. In addition to this, there is the saving of space for ventilation pipes in the floor division that can easily take up 15% of the height of the building. The space that is made available can be exploited by the architect for the benefit of the user and the building owner.

## How Natural Ventilation works

Automatic, controlled as needed, Natural Ventilation centred on the user



### Single sided ventilation

In this situation ventilation is obtained from one side of the room. The principle can be used in e.g. cellular office rooms.



# Comfortable indoor climate centred on the user

A benefit to Users



The Danish Masters Association · Architects: Byens Tegnestue

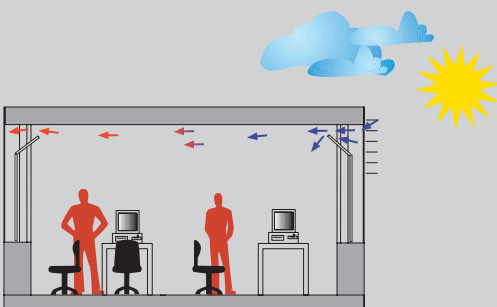


## ▲ A stimulating indoor climate that users can influence

Ventilation through the windows is simple and easy to understand. Small variations in the amount of airflow through the windows are stimulating and contribute to providing a good indoor climate. Attentive contact with the world outside instead of the monotony of a closed building is good for human well-being. Even though Natural Ventilation is automatically controlled, the user always has the possibility of overriding the automatic control from their own PC or via a keypad – because experience conclusively shows that user participation in climate control gives the biggest satisfaction.

## ▲ User control

Using their own PCs users can monitor the indoor climate around them. They can also make personal adjustments to ventilation by opening and closing the windows around their working place. Automatic control is reactivated at a pre-selected time after user control has been implemented.



## Cross ventilation

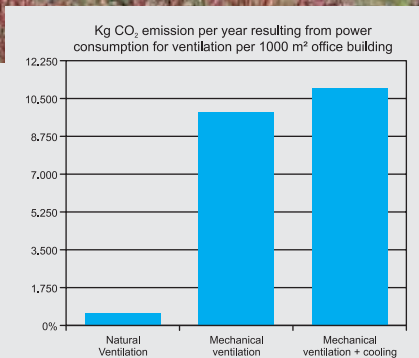
When openness is designed into a building the movement of air can be exploited to the optimum. It could be buildings with open space, or rooms with windows on more than one side.



Hvittingdalsskolen · Architects: DAI Gruppen

# Exploiting the forces of nature to preserve the environment

A benefit to Environment

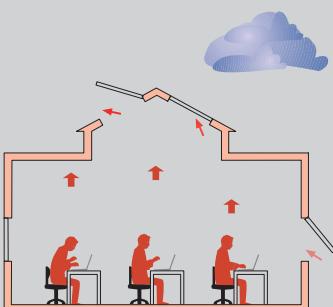


## ▲ Natural Ventilation helps the environment

By exploiting the forces of nature – wind and thermal buoyancy – large amounts of energy can be saved. Natural Ventilation meets today's demands for handling resources sensibly.

## ▲ Reduction of CO<sub>2</sub> emissions

The energy consumption of buildings contributes considerably to the global emission of CO<sub>2</sub>. Since the consumption for mechanical ventilation and cooling forms a considerable part of total energy consumption in many modern buildings, both energy consumption and resultant CO<sub>2</sub> emission can be reduced considerably with an environmentally friendly solution such as Natural Ventilation.



## Thermal buoyancy

Hot air rises and this buoyancy can be exploited to ensure efficient air change in buildings. Atria, stairwells and high ceilings all provide opportunities for utilising thermal buoyancy.



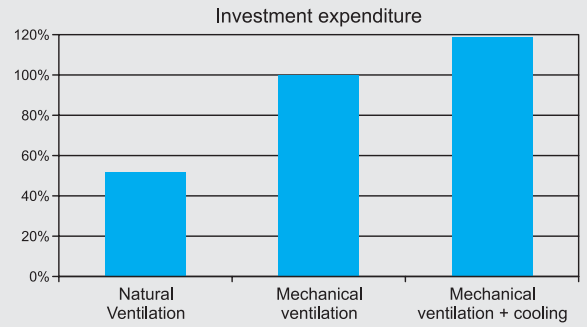
ASTON Group - Architects - DesignGroup

# Natural Ventilation offers a quick return on investments

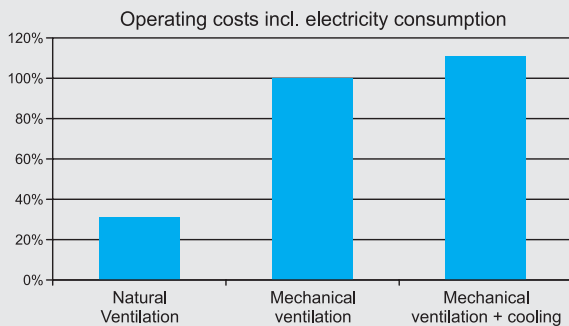
A benefit to Building owners

## ▶ Less investment

Natural Ventilation with advanced control is considerably simpler and therefore involves less investment in equipment than traditional mechanical ventilation systems.



Source: The Engineering College of Aarhus.



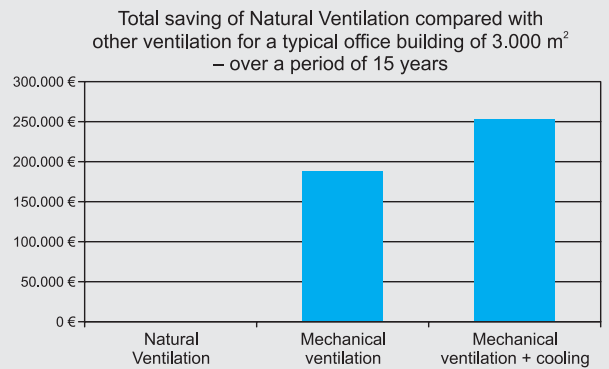
Source: The Engineering College of Aarhus.

## ◀ Better business economy

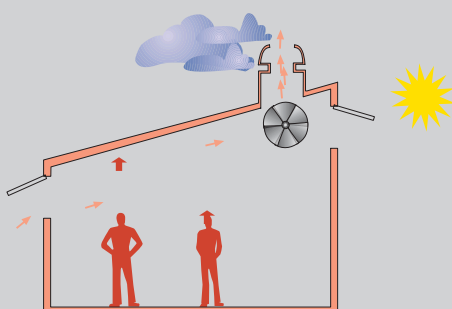
Effective exploitation of the forces of nature generates large savings in energy consumption and maintenance. Natural Ventilation eliminates the need for mechanical ventilation and cooling, which is very energy-intensive, and at the same time saves the maintenance of technically complex systems.

## ▶ Best overall economy

Natural Ventilation is in general terms the most economical of all ventilation solutions. Life cycle cost calculations show that this solution can save up to 250.000 EURO or 83 EURO/m<sup>2</sup> by using Natural Ventilation instead of traditional ventilation/aircondition.



Source: The Engineering College of Aarhus.



## Fan-assisted Natural Ventilation

If sufficient airflow in a building cannot be achieved, a ventilator can assist Natural Ventilation in peak load periods. Insufficient airflow can be due to lack of wind, high outdoor temperature or a building design which does not optimally exploit natural driving forces.

# A good solution demands competency in control, window automatics and Natural Ventilation



## ▲ WindowMaster system solutions

WindowMaster has a great amount of experience with Natural Ventilation and is the leading supplier of complete solutions for Natural Ventilation. A system solution from WindowMaster is based on our control system for Natural Ventilation – NV Advance™. The system includes advanced motors built into the window profiles and intelligent control of Natural Ventilation. WindowMaster takes care of system set-up and commissioning. Thereafter we can offer a service contract to ensure the user of fully qualified support at any time after taking over the building.

Our solutions include:

- Pre-evaluation of projects with Natural Ventilation
- Intelligent window automatics
- Advanced climate control with Natural Ventilation
- Installation and commissioning
- User support

Let WindowMaster assist from the beginning of the project. We are specialists in Natural Ventilation with the knowledge and experience to supply complete, well-proven solutions of the highest quality.

Please request our reference list or visit our web-site.

*We shall be very pleased to provide a project assessment without commitment.*

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