

Let's open a window to the future



Our mission is to ensure an excellent and safe indoor climate primarily through natural ventilation for the benefit of people, productivity, and the environment

We create the perfect indoor climate with help from Mother Nature

The whole world spends enormous resources in the form of money, energy, and effort on our indoor climate, trying to keep everyone safe and satisfied while indoors. From working in office buildings, shops, and factories, to studying at schools and universities, or working out at the gym, every space and every person is different. What's cold for you, might be too hot for your colleague or classmate, and a good solution for one building can be completely unsuitable next door.

At WindowMaster, we address these types of challenges every day. Our solutions for indoor climate management, smoke ventilation, and facade/roof automation meet people's need for fresh air and boost quality of life indoors, in addition to a number of other added benefits.

Windowmaster offers technical, intelligent, and discrete solutions with one single purpose: to ensure fresh air for everyone to breathe. We create the perfect indoor climate with help from Mother Nature.







Reduce energy costs, cut carbon, and get credit for it!



LEED

LEED, or Leadership in Energy & Environmental Design, is a green building certification program. Earn up to 22 points with our solutions.

BREEAM®

BREEAM

BREEAM (Building Research Establishment Environmental Assessment Method) is an environmental assessment method and rating system. **Earn up to 42 points with our solutions.**



DGNB

DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen) is a voluntary certification system for sustainable buildings. Earn **up to 80 points with our solutions.**

Helping the environment. Helping the world

Buildings account for 40%¹ of the world's energy consumption. Natural ventilation is one way we can help change this scenario. When we consume less energy, we conserve our planet's vulnerable resources and help each other improve the environment. Governments all over the world are making demands of the construction industry for green building certifications as one step toward achieving results. Whether you're aiming for a Zero Energy Building or for LEED, BREEAM, and/or DGNB certification, natural ventilation is an effective tool. With natural ventilation, everyone can enjoy low CO₂ emissions and a dramatically reduced carbon footprint compared to mechanical ventilation.







Benefits of a good indoor climate²

- -70% reduction in absenteeism
- 65% reduction in sick building syndrome symptoms
- 18% improvement in performance



People who feel better, perform better

We spend an average of 90% of our time inside buildings. A poor indoor climate brings an increased risk of health issues among employees, school children, students, and people in general. Natural ventilation can reduce absenteeism and sick building syndrome (SBS) symptoms such as headache and dizziness, as well as increase people's performance, whether they're working, studying, recovering or playing. Occupants of naturally ventilated office buildings have a more comfortable thermal environment than occupants of air conditioned buildings. Air temperature is controlled automatically to be just right, providing fresh air for people to breathe at the right time and in the right volume.

Fresh air gives a significantly higher level of user satisfaction. After all, happier people are healthier people.







Natural ventilation is the obvious and sustainable choice for:

- Office buildings
- High–rises
- Pre-schools, schools, universities, etc.
- Shopping malls
- Hospitals
- Sports facilities



Benefits in every environment

Both the commercial and public sectors are showing increased interest in natural ventilation as a way to improve the indoor climate in buildings. The human, environmental, financial, and even aesthetic benefits are well established, regardless of whether you're a developer, building an office high-rise, a municipality building, or sustainably refurbishing a local school.







What we offer

Indoor climate solutions

We help you achieve a healthy, comfortable, and sustainable indoor climate by using the forces of natural ventilation in an intelligent and innovative way.

Smoke ventilation

Our smoke ventilation solutions guarantee compliance with all current regulations, and most importantly, save lives in the event of a fire.

Window automation

Our unique MotorLink® technology, in combination with our MotorControllers, provides intelligent control of facade & roof windows and sunblinds.

Achieve an ideal and safe indoor climate with the right solution for the building

No two buildings are alike. Fortunately, WindowMaster offers a range of solutions to achieve an ideal and safe indoor climate, taking into account the size and location of the building and the facade and roof design. Our natural ventilation solutions provide fresh air free of mechanical intervention, but can also be combined with mechanical solutions or with an existing climate solution. With our smoke ventilation solutions we create safe, smoke-free passages to allow people to escape in case of fire.

Finally, our unique MotorLink® technology provides intelligent automatic control of facade windows and sunblinds. Tell us your plan, and we'll help find the best solution.



Indoor climate solutions

We use nature's forces intelligently

The concept of natural ventilation is based on exploiting the temperature differences between the indoor and outdoor environments, thermal displacement within the building, and winds around the building. By measuring temperature levels in the room and CO₂ levels, our intelligent window actuator systems can open and close your windows automatically. This keeps fresh air permeating the building and the air quality of the individual offices at an optimum level to everyone's satisfaction. No one needs to think about getting up during the day to open and close the window. Maintaining ideal fresh air levels benefits every person in the room. The end result is an indoor climate that works for everyone and keeps on working without anyone noticing.

Basic principles of natural ventilation





Single-sided ventilation

An opening on one side of the room. With single-sided ventilation, the amount of fresh air coming into the room is limited.

Cross-ventilation

Openings in two or more facades create cross-ventilation in a room. This type of ventilation is powered by differences in wind pressure on the sides of the building where the window openings are located.

Stack-ventilation

This is created when there is a height difference in ventilation openings such as between a facade window and a roof window. This type of ventilation is primarily driven by warm air rising, creating a pressure difference.





Indoor climate solutions

Healthy and sustainable indoor climate solutions

All of our indoor climate solutions are based on controlled natural ventilation. But sometimes, there are not enough openings in a building. The simplest solution may be to combine natural ventilation with a mechanical ventilation system. Our natural ventilation solutions are based on BACnet, KNX, LON, and MotorLink® technologies, making them easy to combine with other mechanical ventilation systems and integrate into your building management system (BMS).



NV Advance®

NV Advance[®] is a versatile natural ventilation solution based on intelligent controls. Ideal for large buildings with more than 8 ventilation zones.

The indoor control strategy considers:

- Indoor temperature
- CO₂ levels
- Relative humidity
- Outdoor temperature
- Rain detection
- Wind speed
- Wind direction

NV Advance[®] can also control sunblinds, lighting, heating, and mechanical ventilation.



NV Embedded®

NV Embedded[®] is our distributed and scalable solution that controls the indoor climate based on intelligent monitoring and in-cloud data storage. Suitable for every type of building.

The indoor control strategy considers:

- Building location and function
- Occupant comfort via app
- Ease-of-visualization for climate data
- Wind speed and direction
- Indoor and outdoor temperature
- CO₂ levels
- Rain detection

NV Embedded[®] can also control heating and mechanical ventilation. Future updates will incorporate additional functionality.



Smoke ventilation

Our smoke ventilation solutions can also be used to create a healthy indoor climate – we call this a win-win situation

Smoke ventilation helps people escape a building by creating smoke-free passages in case of fire

When there is a fire, smoke is the enemy. And while the ultimate goal is always to avoid a fire in the first place, it is also important to manage any smoke that may develop so people can breathe and see the escape routes clearly. WindowMaster's advanced smoke ventilation systems work automatically, but can also be connected directly to the fire department's system, if needed. This allows smoke-trained firefighters to control which windows to open along the escape route and choose the proper time to vent the smoke. The windows work like knights in shining armor, giving people in the building the chance to breathe and escape to safety.

All of our smoke ventilation solutions comply with EN and CE requirements



CompactSmoke[™]

Compact smoke control panel for smaller areas. Available in 4–20A and covering up to 10 smoke ventilation groups.



FlexiSmoke™

Flexible, modular smoke control panel for larger areas. Available in 20– 60A and covering up to 39 smoke ventilation groups.



Window automation

We offer chain and spindle actuators, as well as locking and louvre actuators in a wide range of models and sizes with a stroke of 150–1000 mm. Please ask us. We're happy to assist!

Intelligent facades require intelligent technology

WindowMaster offers solutions that meet the requirements of modern facades. We deliver standard and project-specific solutions for window automation for all types of facade projects. With our comprehensive and flexible range of electric window actuators and control units, we can meet any need for window automation in the building envelope. Please feel free to ask us for more information. No matter what project you're planning or how challenged you might be in the process, we would be happy to assist in any way we can.





MotorLink® is simply the smart way to make any facade intelligent

MotorLink® – The standard for BMS interfacing with window actuators



- Position control and feedback
- Three-speed operation
- Reversing function
- Genuine synchronization
- Online parameter set-up



MotorLink[®] is a state-of-the-art digital data communication technology. It provides improved and accurate control and functionality in connection with any BMS that includes automated windows and natural ventilation.

Two-way communication between the MotorLink® window actuators and the MotorController & smoke panels enables the BMS to accurately position the windows. MotorLink® integrates with open bus

communication standards, such as KNX, BACnet, LON, and Modbus. The versatile range and functionality of the MotorLink® technology also means that BMS suppliers and facade companies can deliver robust, flexible control solutions tailored to specific project requirements.







While traditional mechanical ventilation systems occupy 6.5% of a building's floor area, our natural ventilation systems only require a modest 0.2%

Our solutions are:

- Space-saving
- Sustainable
- Energy–efficient
- Economical
- Aesthetically pleasing
- Ideal for refurbishment
- Perfect for creating a healthier and safer indoor climate

Jaking life easier for rofessionals

There are many reasons for incorporating a natural ventilation solution into your project planning from the outset. First and foremost, it gives the architects more space to work with, as they won't have to deal with large mechanical components which require suspended ceilings and leave the occupants with less room in the office and lower ceiling heights.

In fact, we have examples of developers who were able to add an entire extra story to a building after the architects recommended a change from mechanical to natural ventilation early in the planning process. Natural ventilation is a matter of both aesthetics and practicalities. There is no need for large air handling units, equipment rooms, pipework or duct penetrations. The discrete window actuators are built-in, opening and closing automatically according to the users' needs and the weather conditions outside, making them ideal for refurbishment, even in historical buildings. And if a building does need a solution that combines natural ventilation with existing mechanical ventilation, our systems take up hardly any space at all.







According to eight separate studies, an investment in indoor climate solutions based on natural ventilation principles actually pays for itself within less than a year





Even the investment is healthy

A change to this low-cost option is a change for the better across the board, resulting in reduced energy costs, lower absenteeism, increased productivity, and a healthy indoor climate.

An investment in natural ventilation and mixed mode systems pays for itself within less than a year – that means an ROI of at least 120%. Furthermore, over a building's life cycle, capital costs, operating costs, and maintenance costs are 5 times lower with natural ventilation compared to mechanical ventilation, and 2.5 times lower with a combined solution. In addition to the ROI provided by natural ventilation, WindowMaster systems are high-quality and reliable with extremely low operating and maintenance costs. However, components such as window actuators, power supplies, controllers, and above all, the synchronization between the actuators and the window fixtures, should all be inspected regularly. WindowMaster also offers regular service checks and takes care of any repairs.





At WindowMaster, we've been building our expertise since 1990

We have operations in:

- Denmark
- Norway
- Germany
- Switzerland
- United Kingdom
- Ireland
- United States

Our cleantech engineers are the heroes of fresh air

Today, we employ highly-experienced cleantech specialists in Denmark, Norway, Germany, the UK, Ireland, Switzerland and the US. And we work with a vast network of certified partners. Over the years, we've helped thousands of entrepreneurs, architects, facade builders, and consultants to achieve their mutual ambitions. Our expert knowledge of regulatory standards and project development stems from more than 1,000 projects conducted worldwide. We can assist with ventilation proposals, air exchange calculations, CO₂ level calculations, conduct dynamic indoor climate simulations, and perform CFD analyses. Our expertise also includes our superb service.

All of this ensures our clients an advantageous technical and financial solution, and creates the best and safest possible indoor climate for everyone who spends time or lives in the building.







HouseZero, Harvard University Ernst-August-Galerie

Building type	: Office
Architect	: Snøhetta
Consultant	: Skanska Norge AS
Solution	:NV Advance®



Building type	: Shopping, office
Architect	: Jost Hering and Gisela Simon
Consultant	: BAM Deutschland AG
Solution	: NV Advance®
Credentials	: DGNB (German Sustainable Building
	Council)



PNC Tower

Building type	: Office
Architect	: Gensler
Consultant	: PJ Dick (main contractor)
Solution	: MotorLink®
Credentials	: LEED Platinum certified building



Musikkens Hus

Building type	: Multi–purpose music venue
Architect	: COOP HIMMELB(L)AU
Consultant	: MT Højgaard
Solution	:NV Advance®
Credentials	: "City.People.Light" Award 2016 and
	Building of the year 2014 by Magasinet
	Byggeri





Moesgaard Museum

Building type	: Culture
Architect	: Henning Larsen Architects
Consultant	: MT Højgaard
Solution	: NV Advance®



Mesterfjellet Skole

Building type	: Primary and middle school
Architect	: Cebra / SPINN Arkitekter / Various
	Architects
Consultant	: Buer Entreprenør
Solution	: NV Comfort®
Credentials	:Lavenergibygg



Brent Civic Centre

Building type : Multi-purpose, incl. offices, library and cafés, entertainment spaces, meeting rooms, etc.

- Architect : Hopkins Architects : Scott Wilson
- Consultant
- : MotorLink® Solution
- Credentials : BREEAM 'Outstanding' rating



Wexford County Council

Building type	: Office
Architect	: Robin Lee Architecture
Consultant	: Buro Happold
Solution	:NV Advance®
Credentials	: RIBA National Awards winner 2012 and
	"Council of the Year" in 2016



10 benefits of natural ventilation

1. Beautiful architecture

No unsightly pipework or duct penetrations and no bulky ventilation units. Ceiling heights can be increased, as natural ventilation does not require suspended ceilings. More daylight and transparency, including the use of atriums for natural ventilation.

2. Lower energy consumption

Natural ventilation consumes less energy than a comparable mechanical ventilation system. The use of hybrid ventilation can potentially reduce energy consumption even further.

3.100% use of space

Natural ventilation enables full utilization of the building floor plate and floor to ceiling height, as there's no need to devote space to large air handling units and equipment rooms.

A mechanical ventilation system occupies up to 6.5% of a building's floor area compared to only 0.2% for a natural ventilation system.

4. Green profile

Globally, commercial buildings account for up to 40% of all energy consumption.

Natural ventilation has a very low energy consumption, and thus very limited carbon emissions.

It is possible to achieve a 24–71% reduction in carbon emissions by using natural ventilation instead of mechanical ventilation.³

5. High user satisfaction

With a natural ventilation solution from WindowMaster, it's easy to divide your building into different zones, for instance separate office spaces, in order to address a range of different needs.

Users always have the option to override the automatic control, ensuring high user satisfaction.

In air conditioned buildings, only 50% of occupants are satisfied with the indoor temperature at one time, whereas in naturally ventilated buildings, 77% of occupants are satisfied.⁴

6. Gentle refurbishment

With natural ventilation, it's possible to create a good indoor climate in historical buildings without the need to break through walls and ceilings to make way for ducts and large ventilation units.

Natural ventilation is the obvious choice when replacing old windows with new ones simply by installing actuators to control the ventilation process.





7. Fast renovations

With natural ventilation, the renovations can be completed very quickly, thus causing minimal disruption to the lives of the building occupants. Often it is also possible to avoid having to relocate the occupants of a building during the renovation period.

8. Lower costs

The need for fewer and less expensive components and construction work makes natural ventilation a cost-effective option for achieving a better indoor climate.

Over a building's life cycle, capital costs, operating costs, and maintenance costs are 5 times lower with natural ventilation compared to mechanical ventilation and 2.5 times lower with hybrid/mixed mode ventilation.⁵

Our systems pay for themselves within less than a year, resulting in an average ROI of at least 120%⁶ for natural ventilation and mixed mode systems, thanks to energy, health, and productivity gains.

9. Minimal maintenance

No filter replacement. No dirty ducts to be cleaned.

10. Better indoor climate

Studies show that people who spend time in buildings equipped with natural ventilation have fewer buildingrelated symptoms, such as headaches, eye irritation, etc. They also show productivity gains of 3-18%⁷ compared to mechanical ventilation and savings on health costs of 0.8-1.3%⁶.

Finally, SBS symptoms can be reduced by more than 65% with a natural ventilation solution.⁷

- 1. https://ec.europa.eu/energy/en/topics/energyefficiency/buildings
- 2. http://cbpd.arc.cmu.edu/ebids
- 3. carbontrust.com
- 4. R.T. Hellwig, S. Brasche, W. Bischof, Thermal Comfort in Offices – Natural Ventilation vs. Air Conditioning, Healthy Buildings 2006
- 5. Fraunhofer IBP report RK 013/2012/295
- 6. Carnegie Mellon (2004), Guidelines for High Performance Buildings – Ventilation and Productivity
- 7. http://cbpd.arc.cmu.edu/ebids



WindowMaster aspires to protect people and the environment by creating a healthy and safe indoor climate, automatically ventilating spaces with fresh air through facade and roof windows in buildings. We offer the construction industry foresighted, flexible and intelligent window actuators and control systems for natural ventilation, mixed mode ventilation, and smoke ventilation – of the highest quality.

WindowMaster employs highly experienced cleantech specialists in Denmark, Norway, Germany, United Kingdom, Ireland, Switzerland, and the United States of America. In addition, we work with a vast network of certified partners. With our extensive expertise built up since 1990, WindowMaster is ready to help the construction industry meet its green obligations and achieve their architectural and technical ambitions.

windowmaster.com

