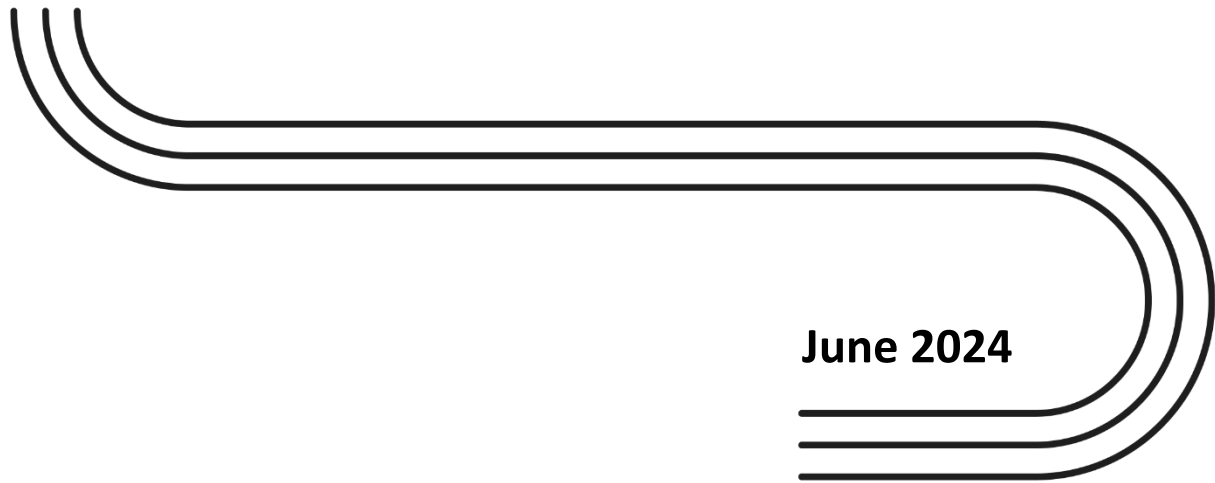
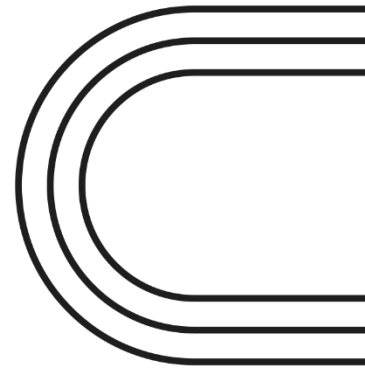


# Good indoor air quality must become a basic human right



June 2024

**GCP EUROPE**  
The voice of Efficient building engineering services

**3E REHVA**  
Federation of European Heating,  
Ventilation and Air Conditioning Associations



# Good indoor air quality must become a basic human right

Poor indoor air quality (IAQ) poses serious health risks, especially to children and the elderly. It also incurs both direct and indirect costs, such as increased healthcare spending and reduced productivity of the European workforce.

Decision-makers consider outdoor air quality so important that 19 out of 27 EU countries<sup>1</sup> have incorporated a healthy environment into their constitutions as a fundamental right. However, it is often forgotten that the need for good air quality does not stop at our doorstep, but also includes the air we breathe indoors – where we spend up to 90% of our daily lives<sup>2</sup>. Several recent scientific studies indicate that the air within homes and other buildings can be even more seriously polluted than the outdoor air especially in the largest and most industrialised cities<sup>3</sup>.

**Indoor air quality is of critical significance and deserves the elevated political attention it merits at the European level.**

For this reason, the signatories of this manifesto urge European policy-makers to:

- make “access to good quality air” (including indoor air) a basic human right by bringing the adaptations needed to the European Treaties and Charter of Fundamental rights if needed;
- give equal (high) consideration to “indoor air quality” as to “ambient air quality” in the adoption of new and revised EU policies;
- operate a screening of all EU policies fit for improved measures towards good indoor air quality and make new ambitious suggestions.

## Signatories:

- *Air Movement and Control Association (AMCA) Europe*
- *European Association of Refrigeration, air conditioning and heat pump contractors (AREA)*
- *European Partnership for Energy and the Environment (EPEE)*
- *European Ventilation Industry Association (EVIA)*
- *Eurovent*
- *Federation of European Heating, Ventilation and Air Conditioning Associations (REHVA)*
- *GCP Europe*



<sup>1</sup> [https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/698846/EPRS\\_ATA\(2021\)698846\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/698846/EPRS_ATA(2021)698846_EN.pdf)

<sup>2</sup> EU Joint Research Centre, 2003 / French observatory on IAQ Exploratory study of the cost of indoor air pollutants: <https://www.anses.fr/fr/system/files/AUT-Ra-CoutAirInterieurSHS2014.pdf>

<sup>3</sup> [Sustainable Environment Research Journal, 2020](#); [Environmental Protection Agency, 2023](#)

# A definition of indoor air quality

## What do we mean by Indoor Air Quality?

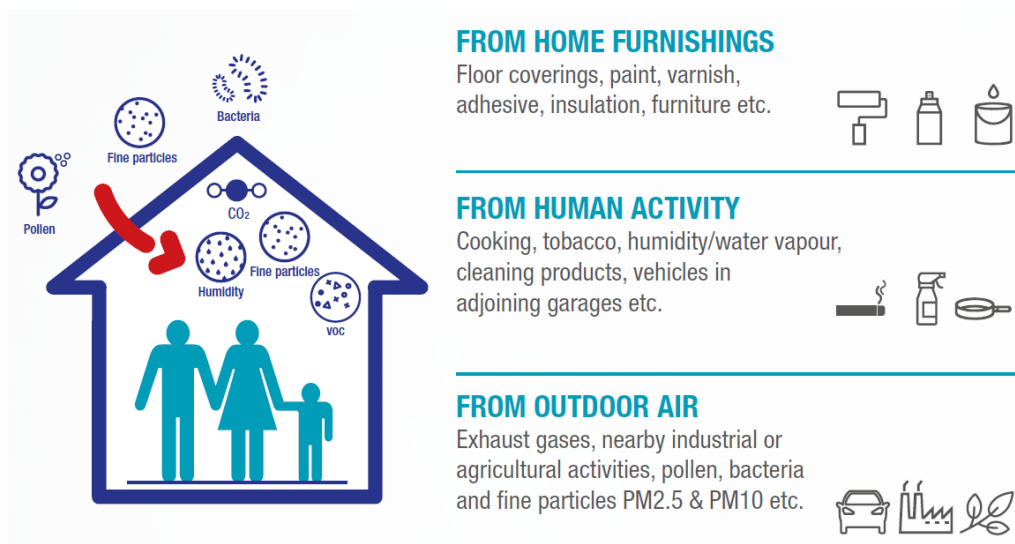
Indoor air quality (IAQ) is a term which refers to the air quality within buildings and enclosed spaces, especially as it relates to the health and comfort of building occupants. Ensuring good IAQ in residential buildings, such as houses and apartments, is crucial for the wellbeing of people in their homes, but also in non-residential structures such as offices, schools, shops, hospitals, and inside public transport. Indoor air pollutants include Volatile Organic Compounds (VOCs), Particulate Matter (PM), viruses and, while CO<sub>2</sub> is not an indoor pollutant as such, it gives a good indication of the extent to which indoor air is confined and is therefore commonly used as a measure of IAQ.

## What impacts the level of Indoor Air Quality?

**83% of Europeans feel concerned (or very concerned) about the poor quality of indoor air.<sup>4</sup>**

The level of IAQ within a building can be affected by many factors including VOCs (emitted from a variety of sources including construction materials and furniture), humidity, odours, chemicals, second hand smoke, and outdoor and indoor air particles that are trapped within buildings.

## Where do the pollutants in our indoor air come from?



<sup>4</sup> Velux Healthy Homes Barometer, 2015

# EU policy that enables good indoor air quality

## How is IAQ regulated?

Today, IAQ standards are determined at the member state level where some regulations exist in a limited number of Member states.

## What policies at EU level support good IAQ?

While there are no EU-wide IAQ standards, there has been an important development in recent years with the recent revision of the Energy Performance of Buildings Directive (EPBD).

The revision of the EPBD represents a major step in recognising the crucial importance of IAQ in buildings for citizens' health, comfort and productivity. **Member States will have to define requirements to ensure that good IAQ is fully part of their national regulatory framework.**

The revised legislation also acknowledges the key role for mechanical ventilation in keeping people and buildings healthy. By requiring mandatory inspection of ventilation systems, the new EPBD will ensure their optimal performance, improve IAQ, tap into the significant energy saving potential of the existing building stock, and raise awareness among consumers about how they themselves can influence IAQ.

The next step will be to ensure adequate transposition in the form of well thought-through national regulations, to ensure that the EPBD achieves its objectives of driving much-needed improvements to our buildings through solutions that result in high IAQ and low energy consumption.



*“Improving the energy performance of buildings is vital for reaching our ambition of climate-neutrality and will bring concrete benefits to our citizens. Renovations are investments into a better future. They will **improve quality of life**, allow people to invest their savings elsewhere, and boost our economy.”*

**Kadri Simson, Commissioner for Energy 2019-2024**

## How could the EU go further?

While the EPBD has been finalised at the EU level, the work is only just beginning at the national level as Member States will transpose the directive over the next two years. **The European Commission has an important ongoing role to ensure that the guidelines to accompany this transposition are as ambitious as possible, in line with the objectives of the EPBD and reflecting the right of all Europeans to good IAQ.**

Beyond the EPBD, EU policymakers could further deliver on the improved health, economic and environmental outcomes associated with improved IAQ through regulatory evolutions such as:

- **Improving the monitoring and regulation of IAQ in residential buildings**
- **Extending inspection of ventilation systems to all buildings**
- **Embedding requirements for buildings to guarantee good indoor air quality in the taxonomy and the green public procurement legislations**
- **Updating ecodesign requirements to ensure energy-efficient ventilation systems are put on the market**
- **Ensuring that the building stock observatory integrates data on indoor air quality and ventilation**

# The right to good indoor air quality – for our health

We spend on average 90% of our time indoors, with the WHO estimating that 150,000 Europeans die prematurely every year due to poor IAQ<sup>6</sup>.

Poor IAQ impacts on health in both the short term – manifesting in immediate symptoms like coughing, sneezing, fatigue, and headaches – but also long term. Over time, compromised IAQ is linked to respiratory issues like allergies, asthma, lung cancer, chronic obstructive pulmonary disease, respiratory infections, and cardiovascular disease. The risk is greatest for the most vulnerable people in our population – the elderly and young children – who tend to spend more time indoors than other members of society and are also more sensitive to poor IAQ<sup>7</sup>.

A well-functioning mechanical ventilation system is particularly important for reducing the potential for transmission of respiratory viruses such as COVID-19<sup>8</sup>, and ensuring people are breathing good quality air in their homes, schools and places of work.

**Exposure to dampness and mould in poorly ventilated buildings significantly increases the risk of respiratory diseases such as asthma and COPD.<sup>5</sup>**



<sup>5</sup> [Velux Healthy Homes Barometer 2022](#)

<sup>6</sup> [WHO Europe, 2019](#)

<sup>7</sup> [https://ec.europa.eu/health/scientific\\_committees/opinions\\_layman/en/indoor-air-pollution/l-2/4-vulnerable-groups.htm](https://ec.europa.eu/health/scientific_committees/opinions_layman/en/indoor-air-pollution/l-2/4-vulnerable-groups.htm)

<sup>8</sup> <https://arxiv.org/abs/2207.02678>

# The right to good indoor air quality – for our economy

Poor IAQ is not only a health problem. If it is not tackled in existing and future buildings, it will also weigh even more heavily on the economy. The Promoting Action for Healthy Indoor Air Project (IAIAQ) calculated that in the European Union every year two million healthy years (i.e. the number of years a person at birth is expected to live in healthy circumstances) are lost due to poor IAQ. This not only means a loss in productivity, it is also placing a heavy burden on our already under pressure healthcare systems.

**Poor IAQ costs Europe €260 billion per year.<sup>9</sup>**

# The right to good indoor air quality – for our future generations

Improving IAQ is especially important for the well-being and success of future generations. This is particularly evident in the context of schools where children spend a significant portion of their time. In addition to the health benefits of good IAQ, studies have shown that a good indoor air renewal, resulting in low CO<sub>2</sub> concentration in the air inside schools, actually increases children's ability to concentrate.

**Improved air quality could boost student performance by up to 15%.<sup>10</sup>**

By improving IAQ in educational buildings, we not only safeguard the health of our children but also cultivate an optimal learning environment which allows them to focus, learn and achieve their full academic potential.

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<sup>9</sup> [WHO, 2015](#)

<sup>10</sup> Wargocki, P and Wyon, D.P., *Providing better thermal and air quality conditions in school classrooms would be cost-effective* (2013)

# How does ventilation improve indoor air quality?

Every day we cook, bathe, clean or adjust the heating periodically to maintain a comfortable temperature. All these activities can lead to the emission of Volatile Organic Compounds (VOCs), particulate matters (PM2.5) and excessive humidity. The build-up of high VOC levels is particularly detrimental to the health of the building's occupants.

An average family of four produces 10 litres of moisture per day. This moisture can in turn lead to the creation of mould spores which are very toxic for people. On top of what we generate ourselves, the home itself can raise moisture levels through condensation due to inadequate ventilation to remove the moist in the air. This effect is compounded in old buildings and when homes are insufficiently heated during wintertime.

## What about just opening a window?

People renew the air in their homes by opening their windows when they don't benefit from a mechanical ventilation system. However, this leads to substantial thermal losses (hot air in the winter and cool air in the summer) and IAQ deteriorates very quickly when windows are closed again. The most effective solution to renewing the air in a home is a controlled mechanical ventilation system, since it limits the energy losses to what is strictly necessary to contribute to a good indoor air quality.

An Ideal energy-efficient home is airtight thanks to appropriate insulation, with a mechanical ventilation system renewing the air in a controlled way, thereby ensuring good indoor air quality and keeping occupants healthy. Mechanical ventilation is often forgotten as we invest in our heating and building envelope.

## Doesn't ventilation consume lots of energy?

Adequate air renewal through a well-functioning mechanical ventilation system not only contributes to keeping people healthy and mitigating the financial risks of poor IAQ, but it also allows significant environmental benefits. Buildings account for approximately 40% of the EU's overall energy consumption and 36% of the EU's overall emissions of greenhouse gas<sup>12</sup>.

***Households can save up to 26% of their heating costs by using energy-efficient ventilation systems.<sup>11</sup>***

As outlined above, mechanical ventilation systems limit thermal losses and optimise heating and cooling needs, thereby improving the overall energy performance of a building, and allowing households to save on these costs. In fact, buildings fitted with a mechanical ventilation system can reduce energy needs by between 15 and 26%<sup>13</sup>.

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<sup>11</sup> Calculated according to the French administration's [energy saving certificate scheme](#) (relative to humidity demand control ventilation BAR-TH-127)

<sup>12</sup> [Energy Performance of Buildings Directive, 2010](#)

<sup>13</sup> Calculated according to the French administration's [energy saving certificate scheme](#) (relative to humidity demand control ventilation BAR-TH-127)

## Does ventilation only matter in new buildings?

Mechanical ventilation is an enabler for the airtight “Zero Energy Home” that many in Europe are moving towards. IAQ has been negatively impacted by the dramatic increase in the airtightness of modern buildings; while making buildings more airtight will indeed ensure they are more energy efficient; it will also make it much harder for polluted air to escape due to the porosity of the building envelope— which is why an efficient mechanical ventilation system is crucial.

However, as approximately 70% of all buildings that will be occupied in 2050 have already been built, it is important to consider not only new dwellings but also the renovation of existing ones, which should also benefit from improved IAQ.

## How do mechanical ventilation systems work?

Mechanical ventilation systems which should be fitted in all buildings (homes, schools, offices, and others) involve the use of fans and ducts to circulate and exchange air, ensuring an adequate flow of incoming fresh air in the least polluted rooms, while stale or polluted air is expelled outside of the building from the most polluted rooms.

There are different types of ventilation systems, some of which are more common in certain countries than others. Heat recovery ventilation systems transfer heat or cold from outgoing air to incoming air, minimising heat loss in the winter and heat gain in the summer. Demand-controlled ventilation systems adjust ventilation rates based on occupancy levels and air quality measurements, optimising the energy usage of an adequate ventilation. Both types of mechanical ventilation systems improve indoor air quality, enhance comfort, and contribute to energy savings.

For more information, please contact [secretariat@evia.eu](mailto:secretariat@evia.eu).

