

# AIR & HEALTH

*Around 90 % of Europeans living in cities are exposed to levels of air pollution deemed damaging for human health.*

**A**lthough air pollution is rarely visible nowadays, Europe's air quality is still a huge problem. Air pollution is responsible for more than 400,000 early deaths in the EU each year [1]. Sensitive and vulnerable groups such as pregnant women, children, the elderly and those already suffering from respiratory and other serious illnesses or from low income groups are particularly affected [2].

The health effects of air pollution are well documented: not only is poor air quality a risk factor for heart and respiratory diseases such as asthma and chronic bronchitis, but it is also

increasingly linked with harm to children's nervous systems and brain development, and even with diabetes.

The World Health Organization's Cancer Agency (IARC) also confirmed that outdoor air pollution can cause lung cancer [3].

Clearly the quality of indoor and outdoor air plays a major role in many chronic diseases in Europe with high costs for the individuals affected, national health services and the economy at large.

## FACTS AND FIGURES

1<sup>ST</sup>  
2 3

Air pollution will become the top cause of environmental-related deaths worldwide by 2050 if no action is taken [5].



### AIR POLLUTION KILLS

over 10 times more people than road traffic accidents in the EU [6].



### 9 OUT OF 10

European city dwellers still breathe air that the World Health Organisation (WHO) considers to be harmful to health [7].



### HEALTH DAMAGE

In the year 2010 alone, the health damage from air pollution in the EU amounted to between €330 and €940 billion, that is 3-9% of the EU's GDP [4].



### FINANCIAL BENEFIT

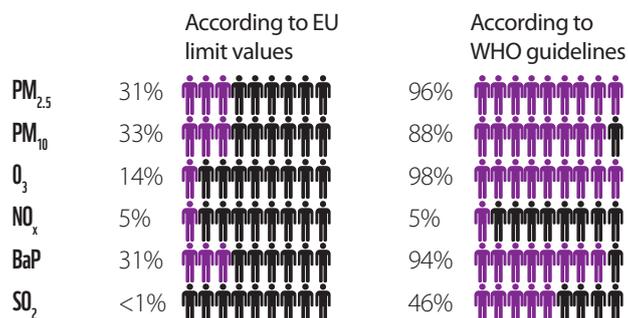
Reducing concentrations of fine particulate matter (PM<sub>2.5</sub>) to WHO recommended levels in 25 European cities would add up to 22 months to the average life expectancy of their inhabitants, resulting in financial benefits of €31 billion per year [8].

## ASSESSING THE HEALTH COSTS OF AIR POLLUTION

One method for putting a price tag on the health effects of air pollution has been developed under the Clean Air for Europe Programme [9]. First, emissions of air pollutants and concentrations are assessed, using modelled and monitored data. Second, people's exposure and the associated health impacts are quantified. Third, these impacts are valued using agreed amounts (see Air & the Economy factsheet).

Such assessments draw on hundreds of studies that are published on the health effects of air pollution. New evidence is now available from large population-based assessments, such as ESCAPE [10]. These epidemiological studies trace the effects of one or more pollutants in people over a certain time. Researchers make sure that health impacts are due to air pollution and not to other factors such as smoking or physical inactivity.

### EU urban population exposed to harmful levels of air pollution

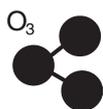


Source: EEA Report, 2013

## HEALTH EFFECTS OF AIR POLLUTANTS



**PARTICULATE MATTER (PM):** short and long-term exposure to PM causes respiratory and cardiovascular disease, atherosclerosis (thickening of the arteries), adverse birth outcomes, impacts on children's development of the brain and nervous system, diabetes, and can result in death. PM is also linked to respiratory infections and asthma in young children. Depending on their size, PM are referred to as either  $PM_{10}$ , which are coarser particles, or  $PM_{2.5}$ , which are finer particles. The smaller the particles, the greater the harm to human health.



**OZONE:** short-term exposure can lead to more frequent hospital admissions and increases the risk of death from heart and respiratory disease. Ozone is also suspected to harm children's cognitive development and contribute to premature births.



**$NO_2$ :** short and long-term exposure has impacts on mortality and morbidity (mainly through cardiovascular and respiratory disease).  $NO_2$  also contributes to the formation of ozone and PM.



**$SO_2$ :** impacts respiratory function and contributes to PM formation.



**METHANE ( $CH_4$ ):** a powerful climate gas which also contributes to the formation of ozone which is harmful to health.



**MERCURY:** a highly toxic pollutant damaging the nervous system at even relatively low levels of exposure, and of particular concern for children.



**BLACK CARBON (BC):** a major component of  $PM_{2.5}$  and a short-lived climate pollutant. Has similar health effects to PM.

## EU LEGISLATION

Current EU air quality standards to limit harmful air pollution were agreed in the late 1990s. However, in many places in Europe, especially in cities, people are exposed to concentrations that are above the legal limits. These EU limit values are 'informed' by World Health Organisation guidelines, but in some cases are much less stringent [11]. For example, allowing Member States to exceed the daily PM concentrations up to 35 times a year has no scientific basis at all. The WHO also recently announced that they will make their guidelines even stricter, following a comprehensive review of the scientific evidence. This assessment showed that serious health effects occur at levels lower than current guidelines and that the range of effects is broader than previously thought.

## EU HEALTH STANDARDS LAGGING BEHIND

25 $\mu$ g/m<sup>3</sup>

EU  $PM_{2.5}$  ANNUAL LIMIT

15 $\mu$ g/m<sup>3</sup>

JAPAN  $PM_{2.5}$  ANNUAL LIMIT

12 $\mu$ g/m<sup>3</sup>

US  $PM_{2.5}$  ANNUAL LIMIT

10 $\mu$ g/m<sup>3</sup>

WHO  $PM_{2.5}$  RECOMMENDATION



## RECOMMENDATIONS

- Adopt ambitious emission reduction commitments in the revised National Emissions Ceilings Directive. Emission reduction commitments must go beyond the Gothenburg Protocol and aim to achieve the health and environmental objectives of the EU's 6<sup>th</sup> and 7<sup>th</sup> Environment Action Programmes by 2030.
- Control emissions from medium combustion installations by setting limits in line with current best available techniques, ensure their rapid entry into force and an adequate permitting and monitoring regime.
- Adopt sector legislation to cut emissions from all major sources of air pollution. Surveillance of compliance is also critical, as shown with road vehicles.
- Enforce current EU ambient air quality limit values so they are met throughout the EU as soon as possible.
- Align EU ambient air quality limit values with the most recent WHO recommendations and health research by 2020.

### More information

- World Health Organization Europe: <http://www.euro.who.int/en/health-topics/environment-and-health/air-quality>
- European Environment Agency: <http://www.eea.europa.eu/themes/air>
- APHEKOM project: [www.aphekom.org](http://www.aphekom.org)
- Health and Environment Alliance (HEAL): <http://www.env-health.org/policies/air-quality/>

For footnotes, please refer to separate reference sheet and to the EEB website.