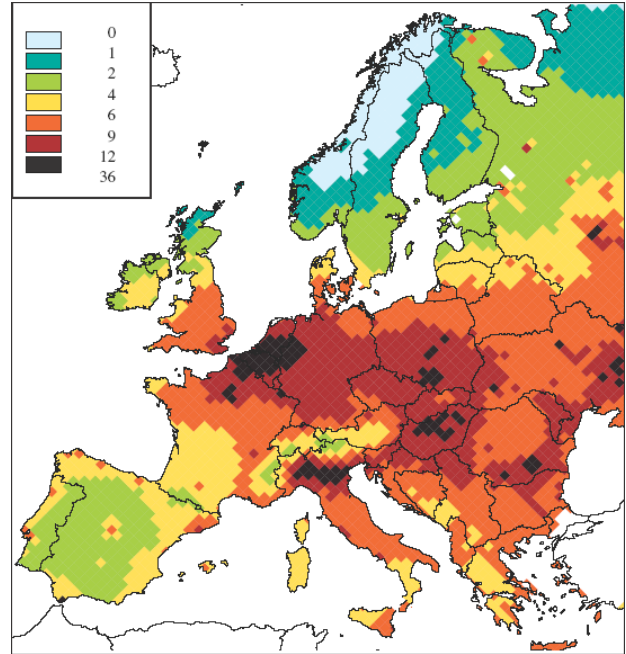


## IMPACTS OF AIR POLLUTION ON HUMAN HEALTH

- Some 310,000 Europeans are estimated to die each year prematurely due to air pollution. This is equivalent of losing over three million European citizens life years. On the average the life expectancy of Europeans is reduced by almost 9 months.
- The main pollutant of concern is particulate matter, which is mainly produced when fossil fuels are burned. In addition, ground level ozone – called sometimes photochemical smog – has important impacts.
- Every working European is on sick leave 0,5 days a year due to different illnesses caused by air pollution, and this equals more then 80 billion euro of the EU GDP.
- There are major variations between Member States in terms of air pollution. The situation is the worst in Benelux area, Northern Italy, and New Member States. (see map)



**Map: Loss in average statistical life expectancy (months) due to identified anthropogenic PM<sub>2.5</sub>**

- The Thematic Strategy on Air Pollution will be adopted by the European Commission in May 2005. This Strategy will set objectives on considerably reducing premature deaths and illness caused by air pollution

### Background

These are some of the results of the recent assessment of air quality in the EU, that will be presented on 21-22 February in the Clean Air for Europe (CAFE)<sup>1</sup> Steering Group.

The pollutant of most concern for human health is airborne particulate matter. For example, particles with a diameter less than 10 millionths of a metre (PM<sub>10</sub>) or even smaller particles such PM<sub>2.5</sub> can penetrate deep into the respiratory tract and bring about adverse cardio-pulmonary effects.

Epidemiological studies have quantified the relationship between the amount to which the population is exposed to airborne particulate matter and various health endpoints. Based upon the known and predicted pollution levels in 2000 and 2020, the damage to human health from exposure to particulate matter has been estimated (see table below).

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<sup>1</sup> <http://europa.eu.int/comm/environment/air/cape/index.htm>

<b>Health effects in 2000</b>	<b>Expected improvement in 2020</b>
<i><b>Particulate Matter</b></i>	
9 months of life expectancy lost	Reduction by 3 months
3 million life years lost annually	Reduction by 1.1 million
288,000 premature deaths annually	Reduction by 80,000
83,000 serious hospital admissions annually	Reduction by 30,500
26 million respiratory medication use days annually	Reduction by 9 million
288 million restricted activity days annually	Reduction by 117 million
<i><b>Ground level ozone</b></i>	
21,400 premature deaths annually	Reduction by 745 premature deaths
30 million respiratory medication use days annually	Reduction by 9 million

The predicted improvements up to 2020 are brought about by the effective implementation of current policies to combat air pollution such as vehicle exhaust emissions limits, national emissions ceilings, industrial pollution controls and ambient air quality legislation.

Despite these predicted improvements brought about current policies, there will remain very significant adverse impacts on human health in 2020. For example, over 200,000 premature deaths are still predicted to take place each year due to exposure to particulate matter in 2020. It is possible to reduce mortality and improve the health status of Europeans in a cost-effective manner.

Air pollution is not just damaging human health. It is a major source of acidification of lakes, forests and other ecosystems. Also too much nitrogen is brought to the soils, lakes and seas to cause eutrophication. Ground level ozone damages crops and air pollution damages buildings. These impacts will also be addressed in the Thematic Strategy on Air Pollution.

**Premature deaths due to air pollution in EU Member States due to particulate matter in 2000**

<b>Austria</b>	4.634
<b>Belgium</b>	10.669
<b>Czech Republic</b>	7.996
<b>Denmark</b>	2.815
<b>Estonia</b>	456
<b>Finland</b>	922
<b>France</b>	36.868
<b>Germany</b>	65.088
<b>Greece</b>	5.309
<b>Hungary</b>	11.067
<b>Ireland</b>	1.008
<b>Italy</b>	39.436
<b>Latvia</b>	910
<b>Lithuania</b>	1.574
<b>Luxembourg</b>	282
<b>Netherlands</b>	13.123
<b>Poland</b>	27.934
<b>Portugal</b>	3.900
<b>Slovakia</b>	3.664
<b>Slovenia</b>	1.281
<b>Spain</b>	13.939
<b>Sweden</b>	2.748
<b>United Kingdom</b>	32.652
<b>Total EU 25</b>	<b>288.275</b>

Source: CAFE CBA Baseline Analysis 2000 to 2020

## Questions and Answers on new EU limits for air pollution

**Already in 1999, an EU Directive set limit values for five important air pollutants, including particulate matter (PM10) - small airborne particles that can enter our lungs, damage their function and thus increase the risk of illness, in particular heart attacks. As of 1 January 2005, the limit values for PM10 are fully in force. This means concretely that Member States must ensure that the air in their country is in conformity with the limit values of the Directive. This will benefit their citizens, as it will help achieve cleaner and healthier air to breathe.**

### What is particulate matter or PM10?

PM10 are small airborne particles with a diameter of 10 micrometer or less. As they are so small, they are especially adverse for health since they penetrate deep into our lungs.

Airborne particles larger than 10 micrometer in diameter are mainly filtered out in the nose and the upper parts of the respiratory system and do not penetrate to the same extent into the sensitive parts of the lungs.

### **What effects does particulate matter have on human health?**

Particulate matter (PM) is one of many polluting substances that we inhale with the air we breathe and that is harmful to us. It aggravates respiratory diseases and increases mortality by substantially reducing life expectancy mainly through increase risks of cardiovascular disease, including heart attacks.

According to the latest estimates of the Clean Air for Europe Programme average loss of life expectancy in the EU is nine months. This varies from a couple of months in some of the Member States with fairly clean air up to almost two years in the worst ones. <sup>2</sup>

Another recent WHO study, on environmental diseases in children, has found that up to 13,000 deaths per year among children aged 0-4 in the 52 WHO European countries<sup>3</sup> are attributable to PM outdoor pollution. If PM pollution levels in these countries were decreased to the EU limit value for PM, more than 5,000 of these lives could be saved, according to this study.

### **Where does particulate matter come from?**

There are many sources of particulate matter, of man-made origin, but there is also natural particulate matter, for example windblown dust or sea salt. Transport activities generate PM due to the combustion of petrol and diesel in motor vehicles. This is sometimes called diesel soot. Additional sources include installations that burn fossil or other fuels. Examples are power plants and small boilers for domestic heating, wood burning installations, and other industrial processes generating various forms of "dust".

### **What does EU legislation state?**

In 1996, the EU adopted a Framework Directive for assessing and managing outdoor air quality, which was followed in 1999 by a "daughter Directive" setting limit values for PM10 as well as the pollutants nitrogen dioxide, sulphur dioxide and lead. The limit values are to be met by certain dates (1 January 2005, with the exception of nitrogen dioxide).

In order to allow Member States to take the necessary measures to reduce air pollution after the entry into force of the Directive in 1999 (to be implemented in the Member States by 2001), a so called "margin of tolerance" was introduced, which decreased every year to reach zero on 1 January 2005 (2010, for nitrogen dioxide). For all zones and agglomerations where there had been an exceedance of the limit value plus the margin of tolerance, the Member State had to prepare and implement a plan or programme to abate air pollution in order to attain the limit value by the specific date. For PM that date is 1 January 2005.

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<sup>2</sup> See table Table 5.1 of the "Baseline Scenarios for the Clean Air for Europe (CAFE) Programme Final Report" available at [http://www.europa.eu.int/comm/environment/air/cale/general/pdf/cale\\_lot1.pdf](http://www.europa.eu.int/comm/environment/air/cale/general/pdf/cale_lot1.pdf)

<sup>3</sup> For WHO European members see link:

<http://www.euro.who.int/AboutWHO/About/MH>

The WHO report can be found at :

[http://www.euro.who.int/mediacentre/PR/2004/20040617\\_1](http://www.euro.who.int/mediacentre/PR/2004/20040617_1)

The Directive requires Member States to meet the air quality objectives set to reduce harmful effects on humans and the environment. Member States have to monitor air quality and if the air pollution level is too high they have to take action to bring down the levels. Each year, they must also send the Commission a list of "zones and agglomerations" where the air quality limit values have been exceeded.

The Commission is, through this Directive, trying to make sure that the air we breathe fulfils a certain standard across the EU. It should be kept in mind that there are also effects below the limit values, and further emission reductions are needed to ensure clean air for the EU citizens.

### **Where do levels of particulate matter exceed its limits today?**

Based on the reporting from the Member States the European Commission has assessed that in 2002, twelve of the 15 Member States had pollution levels which exceeded the limit value and margin of tolerance for that year. The Member States concerned are Austria, Belgium, France, Greece, Germany, Ireland, Italy, Portugal, Spain, UK, the Netherlands and Denmark. Exceedances are mainly linked with particulate matter, and occur mainly in large cities and in the vicinity of large industrial zones.

### **What can be done to limit particulate matter PM?**

It is necessary to combine local, national and European actions to limit the emissions of particulate matter. At the local and national levels, many initiatives have already been taken, although more are still necessary.

They include measures to reduce polluting traffic (congestion charges, ban on polluting vehicles in the cities, installation of particulate traps on urban buses), strict standards for domestic heating and bans of the use of polluting fuels in cities

### **What are the next steps taken by the European Commission?**

The Commission's action will help achieve cleaner air in European cities to the benefit of their inhabitants. This will partly be done through careful monitoring of how the Member States implement the EU legislation. But the Commission intends to do more and is now preparing an integrated action plan to further improve the quality of the air for Europeans (Clean Air for Europe - CAFE). This plan will be adopted by the Commission by mid-2005.

At the moment, the Commission is consulting European citizens about what they think about the quality of the air they breathe and the measures to improve it. The consultation in the form of a questionnaire on the Internet is open until the end of January.

You are invited to give your views at:

<http://europa.eu.int/yourvoice/forms/dispatch?form=356&lang=EN>