



# Environment fact sheet: moving towards clean air for Europe



- Air pollution continues to damage human health and the environment despite the success of EU and international policy action in reducing levels of some air pollutants. Respiratory and other diseases linked to the most threatening pollutants, particulate matter and ground-level ozone, cause some 370,000 premature deaths a year in the European Union.
- Air pollution is caused mainly by economic activities, such as industry, transport, power generation and agriculture, as well as by households. In some regions natural sources may also contribute to air pollution.
- To accelerate progress the European Commission has proposed a new EU air pollution strategy. This will achieve further significant improvements in air quality by 2020 and thereby protect citizens and the environment more effectively.
- The strategy reflects latest scientific knowledge and for the first time will limit airborne concentrations of the finest particulate matter, which damages health by penetrating deep into the lungs.

## The main air pollutants and their sources

**Particulate matter** (fine dust) comes from natural sources such as sea salt and wind-blown soil, sand and dust, but is mainly emitted by road vehicles, shipping, power generation and households. It harms human health.

**Sulphur dioxide** (SO<sub>2</sub>) is emitted by power generation, industry, shipping and households. It harms human health and contributes to acidification\* and ground-level ozone.

**Nitrogen oxides** (NO<sub>x</sub>) are emitted by road vehicles, shipping, power generation, industry and households. They harm human health and contribute to acidification,\* eutrophication\* and ground-level ozone.

**Ammonia** is emitted from livestock farming and the fertiliser use in agriculture. It harms human health and contributes to acidification,\* eutrophication\* and ground-level ozone.

**Volatile organic compounds** (VOCs) are emitted by road vehicles, shipping, power generation and industry. They contribute to ground-level ozone.

**Ground-level ozone** is a secondary pollutant caused by NO<sub>x</sub> and VOCs reacting in sunlight. It harms human health, nature and biological diversity, crops and materials.

*\* These terms are explained in the box on page 3*



## Fact 1: Air pollution damages human health and the environment

Air pollution damages human health and the environment. Some air pollution comes from natural sources like sea salt or wind-blown soil and dust, but the majority of pollutants are emitted from economic activities, such as industry, transport, power generation and agriculture, as well as by households. The European Union has been taking action to reduce air pollution since the 1970s with considerable success, but achieving further improvements remains a priority. Air pollution is one of European citizens' biggest environmental concerns: a 2004 Eurobarometer survey for the European Commission found 45% of those polled were worried about it.

For their direct impacts on human health, the pollutants of most concern today are ground-level ozone and particulate matter (fine dust). Human exposure to these pollutants has effects ranging from minor impacts on the respiratory system to severe health damage and premature death.

It is estimated that present levels of particulate matter in the air are reducing the life expectancy of citizens in the EU by an average of eight months, and by up to two years in the worst affected areas. The economic cost of this health damage has been valued at between 276 and 790 billion euros for the year 2000 (the range reflects different ways of valuing human life).

Ground-level ozone and several other pollutants also do considerable harm to the wider environment, in various ways. The economic cost of this damage is substantial too, though no agreed method exists for quantifying it. Ground-level ozone causes physical damage to agricultural crops, forests and plants, reducing their growth rates. Nitrogen oxides (NO<sub>x</sub>), sulphur dioxide and ammonia harm soil and water bodies by acidifying them, causing loss of plant and animal life. Emissions of ammonia and NO<sub>x</sub> can disrupt land and water ecosystems through excessive inputs of nutrients (a process known as eutrophication), with the same result. And several air pollutants cause damage to materials, leading to a deterioration of buildings and monuments through corrosion and soiling.

## Fact 2: Tackling air pollution requires international cooperation

Air pollutants ignore national borders and can be carried over very long distances by the wind. This means that air pollution is not only a local or national issue but one that needs to be tackled through cooperation at European, international and even global level.

Cooperation among EU Member States began with the adoption of the first EU standards for exhaust emissions from cars in 1970. Within the northern hemisphere cooperation has been driven by the Convention on Long-Range Transboundary Air Pollution. This was adopted in 1979 by European countries, the United States and Canada. The Convention, which today has 50 member countries, has led to a series of protocols to control emissions of the main air pollutants which have in turn been implemented by the EU. It has also set up a task force, led jointly by the EU and the US, to achieve a better understanding of the transcontinental transport of air pollution. This is an important issue for the EU; though emissions of most air pollutants have been reduced within the EU itself, not least through improved technologies, emissions elsewhere – even on other continents – can adversely affect EU air quality.

In other parts of the world air pollution can be even more damaging to human health because of people's exposure to pollution not only outside but also in their homes. Indoor air pollution is a major health threat in many developing countries due to the use of open fires and poor quality heating appliances as well as the low quality of the fuels used. The EU Energy Initiative for poverty alleviation and sustainable development, launched in 2002 at the World Summit on Sustainable Development, is helping to tackle this problem by promoting access to safe, modern, affordable and sustainable energy services.

### **Fact 3: Policy action has brought significant reductions in air pollution ...**

Over the past three decades the EU has put in place a series of legislative and other policy measures that have brought significant progress in reducing air pollution.

EU air quality standards have been established that limit airborne levels of acidifying gases, ground-level ozone, particulate matter, dangerous heavy metals and a number of other pollutants. Polluting emissions have been steadily reduced from large combustion plants – industrial boilers burning fuel to generate electricity and/or heat – and other major industrial installations, as well as from road vehicles and other mobile sources such as ships. Fuel quality has been improved and environmental protection requirements incorporated into policies in the transport and energy sectors.

These EU measures, together with national and international action, have brought significant cuts in some forms of air pollution, including reductions in acid rain and in winter pollution events such as smog. Despite these advances, however, other forms of air pollution, in particular high concentrations of fine particulates and ground-level ozone, continue to have serious impacts on human health and the environment.

### **Fact 4: ... But more action is needed. The European Commission has proposed a new strategy to accelerate the improvement in Europe's air quality**

Against this background, in September 2005 the European Commission proposed an ambitious new air pollution strategy for the EU. The Thematic Strategy on Air Pollution aims to achieve further significant improvements in air quality across Europe by 2020. It was prepared over a period of more than three years through the Commission's Clean Air for Europe (CAFE) programme on the basis of the latest scientific knowledge and extensive research, analysis and consultation of stakeholders.

The strategy was requested by the European Parliament and the Council of Ministers (representing EU Member States) in 2002 when they adopted the 6th Environmental Action Programme, the EU's roadmap for environmental policy action up to 2012. The strategy's objective – according to the action programme – is to achieve "levels of air quality that do not give rise to significant negative impacts on, and risks to, human health and the environment."

However, the Commission's analysis has since shown that such levels cannot be reached everywhere in the EU in the foreseeable future – even if the best existing technologies are used regardless of cost – since it is clear that air pollution has harmful effects even at low concentrations. Recognising this reality, the strategy establishes demanding but cost-effective interim objectives for reducing air pollution in the EU up to 2020 and proposes a set of policy measures for achieving them.

### **Fact 5: The new EU strategy will substantially improve protection of human health and the environment**

If fully implemented, the strategy will cut the number of premature deaths from diseases related to air pollution by particulate matter and ground-level

### **The effects of air pollution**

**Human health:** Air pollution has impacts on human health ranging from minor effects on the respiratory system to reduced lung function, asthma, chronic bronchitis and premature death.

**Acidification:** Acid deposits damage forests, rivers, lakes and other ecosystems as well as materials such as buildings and historical sites.

**Eutrophication:** This is the name given to the pollution of water bodies and soil by excess input of nutrients such as nitrogen oxides and ammonia. This pollution can cause severe damage to plant and animal life. In waters it leads to excessive growth of algae which can choke off other types of flora and fauna.

**Material damage:** Acidification and particulate matter damage buildings and monuments, including historical sites, through corrosion and soiling.







ozone from 370,000 a year in 2000 to 230,000 in 2020 – a reduction of almost 40%. Without the strategy there would still be over 290,000 premature deaths a year in 2020.

The strategy will also substantially reduce the area of forests and other ecosystems suffering damage from airborne pollutants such as acid rain and ground-level ozone. For instance, the forest area affected by acidification in 2020 will be halved and the total area of land and aquatic ecosystems affected by eutrophication reduced by 27% compared with the situation without the strategy.

In monetary terms, the health benefits alone of the strategy exceed its cost by at least five times. The health benefits are estimated to be worth between 42 to 135 billion euros a year in 2020, while the cost of implementing the strategy's measures is put at 7.1 billion euros a year.

### **Fact 6: For the first time, the strategy introduces an EU-wide limit on airborne concentrations of the finest particulates**

The strategy's objectives will be met through a mix of policy measures, including new or revised legislation, access to EU funding and international cooperation through the Convention on Long-Range Transboundary Air Pollution. Attaining them will require action in the economic sectors that contribute to air pollution, such as energy, industry, transport and agriculture.

To help Member States implement EU air quality legislation more efficiently, the Commission has proposed simplifying and consolidating the existing laws into a single text. This is an important contribution to the EU's drive for better regulation. The single law will also introduce an EU-wide limit on airborne concentrations of the finest particulates (known as PM<sub>2.5</sub>), which are believed to cause most harm by penetrating into sensitive areas of the lungs. This will complement the existing limit on coarser particulates (known as PM<sub>10</sub>).

A range of other relevant EU legislation will be reviewed, and proposed for revision as necessary and where this is cost-effective. These include limits on exhaust emissions from cars and trucks, as well as national ceilings on Member States' total emissions of sulphur dioxide, nitrogen oxides, ammonia and volatile organic compounds.

#### **Further information**

- European Commission CAFÉ programme website:  
<http://europa.eu.int/comm/environment/air/cafe/index.htm>
- European Environment Agency air quality website:  
[http://themes.eea.eu.int/Environmental\\_issues/air\\_quality](http://themes.eea.eu.int/Environmental_issues/air_quality)
- UN ECE CLRTAP web site:  
<http://www.unece.org/env/lrtap/welcome.htm>