European Commission

Cleaner air for all

Why is it important and what should we do?

- Air pollution damages our health and the environment. It is caused mainly by economic activities such as industry, transport, energy and agriculture, as well as some domestic household activities like heating.
- The air is cleaner today than it has been for the last two decades – policy actions and international co-operation have successfully reduced air pollution significantly. For example, sulphur dioxide emissions – the main cause of acid rain – have been cut by more than 80 %, but…
- …more action is needed to make further progress: fine particles and ground-level ozone still create serious health problems, and emissions continue to harm many natural environments. The latest analysis suggests that 420 000 people died prematurely from air pollution in the EU in 2010. Public concern is growing.
- Commissioner Potočnik has therefore announced 2013 as the 'Year of Air' – and is carrying out a thorough review of European air policy in order to shape a new strategy to substantially improve air quality in the EU. This will enhance compliance and implementation of current regulations, propose new measures and targets to protect health and the environment, promote innovation for cleaner products and processes, and create better coherence with other policies and international initiatives.

Environment

FACT 1: Air pollution damages our health and environment

There is a large body of evidence on the health impacts of air pollution. The European Commission estimates that it caused 420 000 people to die prematurely in the EU in 2010. Of particular concern are particulate matter (PM) – a type of fine dust – ground-level ozone (O_3) and nitrogen dioxide (NO_2).

The latest study from the World Health Organization (WHO)[1] links long-term exposure to very fine particles ($PM_{2.5}$) with cardiovascular and respiratory deaths, as well as increased sickness, such as childhood respiratory diseases. According to the EEA[2], more than 80 % of the EU's urban population is exposed to PM levels above the 2005 WHO Air Quality Guidelines, depriving citizens of more than eight months of life on average – with life expectancy reduced by up to two years in the most polluted places. There is also new evidence for the effects of long-term exposure to ozone on mortality and reproductive health.

As well as health risks, air pollution causes significant damage to our environment and ecosystems. Ground-level ozone damages agricultural crops, forests and plants, reducing their growth rates. Nitrogen oxides (NO_x), sulphur dioxide (SO_2) and ammonia (NH_3) harm soil, lakes and rivers by acidifying them, causing loss of animal and plant life. Ammonia and NO_x also disrupt land and water ecosystems by introducing excessive amounts of nutrient nitrogen – a process known as 'eutrophication'. It is estimated that two-thirds of the protected sites in the EU Natura 2000 network are currently under severe threat from air pollution.

What are the main air pollutants – and where do they come from?

Particulate matter (PM) is fine dust, emitted by road vehicles, shipping, power generation and households, and from natural sources such as sea salt, wind-blown soil and sand. Health concerns focus on particles of less than 10 micrometres (µm) in diameter (PM_{10}) – especially those of less than 2.5 µm across ($PM_{2.5}$).

Sulphur dioxide (SO_2) is emitted by power generation, industry, shipping and households. It harms human health and contributes to acidification[3] of soils and inland waters.

Nitrogen oxides (NO_x) are emitted by road vehicles, shipping, power generation, industry and households. They harm human health and contribute to acidification and eutrophication[3]. Nitrogen oxides are also one key component in increased levels of ground-level ozone (O_3).

Ammonia (NH_3) is emitted by livestock farming and the use of fertilisers in agriculture. It harms human health as a building block for so-called secondary PM and contributes to acidification and eutrophication.

Volatile organic compounds (VOC) are emitted by the use of solvents in products and industry, road vehicles, household heating and power generation. VOCs are the key component in the formation of ground-level ozone.

Ground-level ozone (O_3) is a secondary pollutant produced by chemical reactions of NO_x and VOCs in sunlight. It harms human health, the environment, crops and sensitive construction material like metals and paints.

(3) These terms are explained in the text box on next page.

FACT 2: Tackling air pollution requires international co-operation

Air pollution ignores national borders and can be carried very long distances by the wind, so it needs to be tackled through co-operation at European, international and global level.

The EU started early with its air policy to protect human health and the environment. It adopted the first European standards for exhaust emissions from cars in 1970. Over time, emissions of most air pollutants have been reduced in the EU by setting new standards that required improved technologies and promoted innovation, both for mobile sources, such as road vehicles, and stationary sources, like power plants and heavy industry.

But emissions from elsewhere can also adversely affect EU air quality – other parts of the world often use older technologies and lower standards. Cross-border co-operation is therefore necessary to tackle air pollution. In the northern hemisphere, international co-operation has centred on the Convention on Long-Range Transboundary Air Pollution (CLRTAP) – hosted by the United Nations Economic Commission for Europe (UNECE). The convention was adopted in 1979 by European countries, the United States and Canada. Today, it numbers 51 member countries and has led to a series of protocols to control emissions of the main air pollutants.

(1) WHO review of evidence on health aspects of air pollution – carried out at the European Commission's request.
(2) EEA Report No 4/2012, 'Air quality in Europe – 2012 report' http://www.eea.europa.eu/publications/air-quality-in-europe-2012

FACT 3: EU co-operation and policy action have reduced air pollution already

Over the past four decades, the EU has put in place legislative and other policy measures that have made the air we breathe today much cleaner than before.

There are two main EU instruments dealing with overall air pollution. The first is the EU Ambient Air Quality Directive (revised and adopted in 2008), which sets EU air-quality standards for ground-level ozone, PM, nitrogen oxides, dangerous heavy metals and a number of other pollutants. The second is the National Emissions Ceilings Directive (adopted in 2001), which caps overall emissions of sulphur dioxide, nitrogen oxides, ammonia and volatile organic compounds (VOC).

Emissions have been steadily reduced over time, especially from large combustion plants, industrial installations and road vehicles. Fuel quality has been improved and environmental protection requirements incorporated into policies in the transport, industry and energy sectors.

As a result, the EU has achieved a so-called absolute decoupling between economic growth and emissions. For example, while European economies have grown significantly over the last two decades, sulphur dioxide emissions have been reduced by 80-90% – meaning that acid rain, a problem that ravaged Europe in the 1980s, has now almost been solved.

FACT 4: But more needs to be done – 2013 is the 'Year of Air' for EU environment policy

There are still major challenges to human health from poor air quality, however. The most recent air-policy initiative was launched in 2005 with the 'Thematic Strategy on Air Pollution', but the EU remains a long way from its long-term objective, "to achieve levels of air quality that do not result in significant impacts on human health and the environment", as set out in the EU Environment Action Programme. Several EU air-quality standards are still not respected in many regions and cities, and people's health is suffering as a result, with rising costs to health care and the economy.

Time is therefore ripe to assess and strengthen EU air policy, such as considering new emission ceilings in the NECD so as to include more ambitious targets for 2020 and beyond. For this reason, the European Commission has embarked on a thorough review of EU air policy, which is expected to be finalised this year. The Environment Commissioner has also made 2013 the 'Year of Air', to raise general and political awareness about air pollution, and promote a large number of air-related events and initiatives (such as the 2013 edition of Green Week, Europe's largest annual conference on European environment policy) to be organised at EU, national and local levels.

The air policy review responds to a clear demand for action. The latest Eurobarometer survey on air-quality issues[4] showed that more than half of Europeans believe air quality has deteriorated in the last 10 years. In addition, seven out of ten Europeans say they are unhappy with efforts by public authorities to improve air quality – and four out of five think the EU should propose additional measures to address air pollution.

What are the effects of air pollution?

Health problems include serious effects on the cardiovascular and respiratory systems leading to reduced lung function, asthma, chronic bronchitis and premature deaths.

Acidification of soils and sources of water damages plant and animal life in forests, lakes and rivers, as well as buildings and historical sites.

Eutrophication – an excess of nutrients, such as nitrogen oxides and ammonia, in water or soil – threatens biodiversity through the excessive growth of simple plants which damage other plants and animals in soils, rivers and lakes.

Physical damage to buildings and monuments, due to corrosion and soiling of their surfaces, can result from particulates and acidification.

(4) Flash Eurobarometer 360, 'Attitudes of Europeans towards Air Quality', January 2013.

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FACT 5: The current air-policy review will lead to a new strategy to help protect our air, health and environment

Building on previous successes, the European Commission's review of air policy, including stakeholder and public consultations, will result in a renewed EU strategy for clean air for the period up to 2030 and beyond, with the following focus:

1. Protect our health

The most important long-term goal is to reduce further the exposure of citizens to air pollution. This requires, as a first step, ensuring a minimum level of protection for all EU citizens, meaning that the EU air-quality standards are not exceeded anywhere.

2. Protect our environment

The EU also aims to protect all ecosystems from stress due to acidification or eutrophication. This will involve continued efforts to reduce emissions in key sectors such as power generation, road transport, energy-intensive industries and waste management – with increased focus on sectors which have not yet received enough attention, such as shipping, domestic heating and agriculture.

3. Additional efforts to implement existing commitments and achieve further emission reductions in future

To deliver these objectives, the review is considering a range of cost-effective measures to bring down emissions even further. Simply by applying existing technologies on the widest possible scale, it is estimated that we could avoid around 100 000 premature deaths a year, and eliminate a third of the eutrophication impact on the protected sites in the Natura 2000 network within a decade.

4. Innovation to reduce emissions and support growth

Meeting these ambitious goals for air quality will require the development and application of new technologies. The Horizon 2020 research programme and Innovation Union initiative will help, and European industry will need to invest in cleaner technologies. This will bring both economic and social benefits, as health costs and lost working time due to air pollution can be very significant.

It will benefit European competitiveness, too. US air-quality legislation is already more stringent than in the EU, and countries like China are beginning to step up air-quality monitoring and emission controls. These developments create an enormous demand for products and processes that emit less – a huge opportunity for European companies to contribute to sustainable growth and jobs.

5. Coherence with other policies and international initiatives

The review will seek coherence between EU air policy and the recently revised CLRTAP Gothenburg Protocol, which includes new emission ceilings for 2020, including for particulate matter. The Union will also work to ensure broader ratification of the Protocol by countries outside the EU, which would bring large air-quality benefits both for EU neighbouring countries and for the Union itself.

In addition, the European Commission is looking at how to make sure that air policy can benefit from climate and energy policies and vice versa. For example, reducing Short-Lived Climate Pollutants will simultaneously benefit health and limit climate change.

Europe has achieved great improvements in air quality over recent decades, but much more remains to be done. The current review will deliver a strategy to achieve even cleaner air in future, bringing very significant benefits to our health, environment and economy.

Further information

European Commission web pages for Janez Potočnik, European Commissioner for the Environment:
http://ec.europa.eu/commission_2010-2014/potocnik

European Commission web pages on Air Policy:
http://ec.europa.eu/environment/air

European Environment Agency web pages on air pollution:
http://www.eea.europa.eu/themes/air

United Nations Economic Commission for Europe web pages on the Convention on Long-Range Transboundary Air Pollution:
http://www.unece.org/env/lrtap

Innovation Union initiative:
http://ec.europa.eu/research/innovation-union/index_en.cfm

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