



Air quality in Europe

22 June 2016, Krakow

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Air



Air pollution is still a problem across Europe

Europe's air quality is slowly improving, but fine particulate matter and ground-level ozone in particular continue to cause serious impacts on health.

Estimates point to well above 400.000 premature deaths in EU-28 each year due to particulate matter; more than 70.000 due to nitrogen dioxide.

3 out of 10 of the urban population citizens are exposed to particulate matter above EU standards; with 9 out of 10 exposed above WHO guidelines.



63%

Air pollution exceeds eutrophication limits in 63% of ecosystem area, and in 73% Natura2000 area.



Source(s): EEA, Air Quality in Europe (2015) und SOER (2015)



Increasing awareness of air quality urgencies

A photograph showing several individuals, including children, wearing dark clothing and blue surgical-style face masks. They are walking through a thick layer of haze or smog. In the background, there are blurred streetlights and what appears to be a road or intersection. The overall atmosphere is one of air pollution.

An aerial photograph of Paris, France, showing the Eiffel Tower and other landmarks partially obscured by a thick layer of haze or smog. The city's dense urban landscape is visible below the atmospheric conditions.

München 1°

Süddeutsche Zeitung

SZ.de Zeitung Magazin

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5. Februar 2016, 18:48 Uhr Stickoxid-Emissionen

Die Luft bleibt dreckig - mindestens bis 2030

Feinstaub-Alarm

Dieserzeit! Umweltzone Stuttgart

Busse/
Büros/
Bahnen
nutzen

Geforderte wie
verlangt der Böden
bereiches unter den
hohen Abgaswerten,
selbst mit Einfluss
der Politik ist
keine Befreiung
erreichbar. Eine
Besserung in Stuttgart
ist ebenso (pnp)

Analyst von Joachim Becker

Wnherzca.bn / Wydawnictwo bei | Ekoologia | Ochrona | po lutacji

EL PAÍS

CONTAMINACIÓN • La capital vulnera por sexto año seguido los límites de contaminación

• El informe anual de Ecologistas en Acción concluye que en 2015 los niveles de contaminación han sufrido un incremento notable

• **Las alertas por contaminación se vuelven cotidianas**

• **"Intentamos pasar muy poco tiempo al aire libre"**

ESTHER SÁNCHEZ | Madrid | 12 ENE 2016 - 21:27 CET

 3

Archivado en: Manuela Carmena Contaminación atmosférica Madrid Comunidad de Madrid
Contaminación Ayuntamientos Problemas ambientales Gobierno municipal



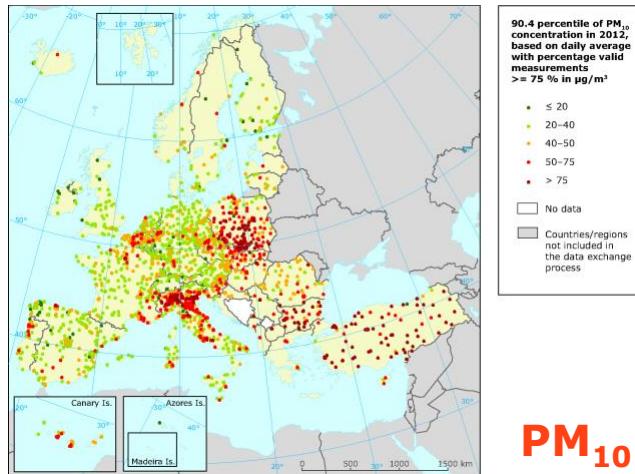
A photograph showing a group of people, mostly young adults, wearing white face masks with the word "KRAKOW" printed on them in black. They are standing in front of a large, ornate building with a golden dome, possibly a church or cathedral. Some individuals are holding up large, white, semi-circular signs with the letters "K" and "R" visible. The scene appears to be a protest or a public demonstration. The sky is overcast.

The image shows the front page of the Flemish newspaper 'De Morgen'. The main headline reads 'Vlamming kickt af van DIESEL' (Flemish ministers ban diesel). Above the headline, there's a box with the text 'BENT U PRETENTIËLUS? Het kan geen kwaad' and two small stars. To the right of the headline is a photo of a man in a suit. Below the headline is a large photo of a car. At the bottom left, there's a box for 'ZERKEN VAN HORECABEDRIJFEN'. On the right side, there's a sidebar with the heading 'ECONOMIE' and the subtext 'Is uit balans?'.

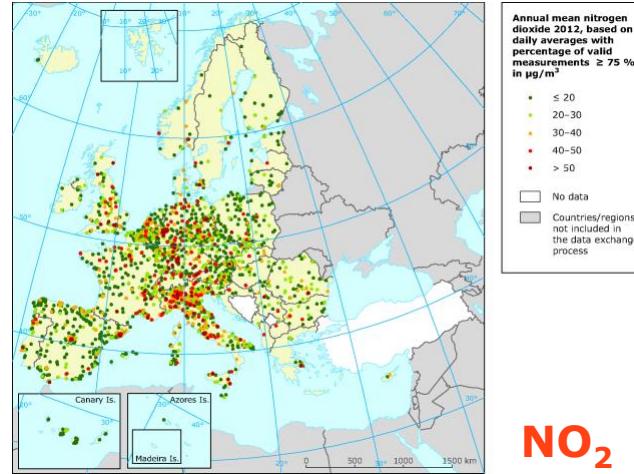
Source(s): Various online and print media



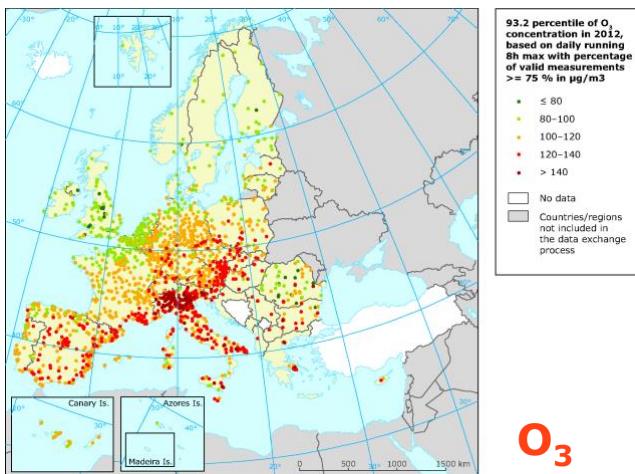
Where is air pollution a problem?



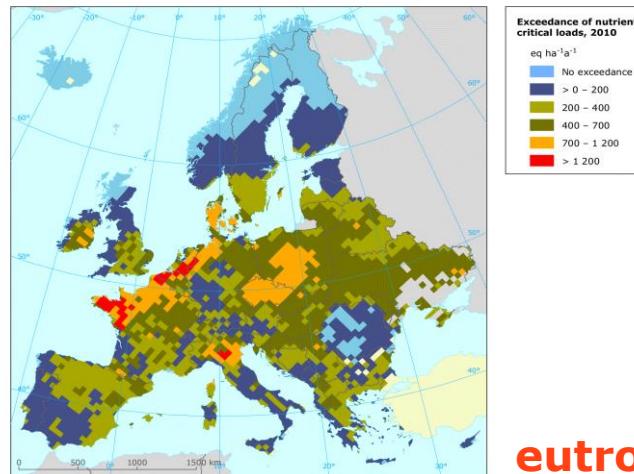
PM₁₀



NO₂



O₃

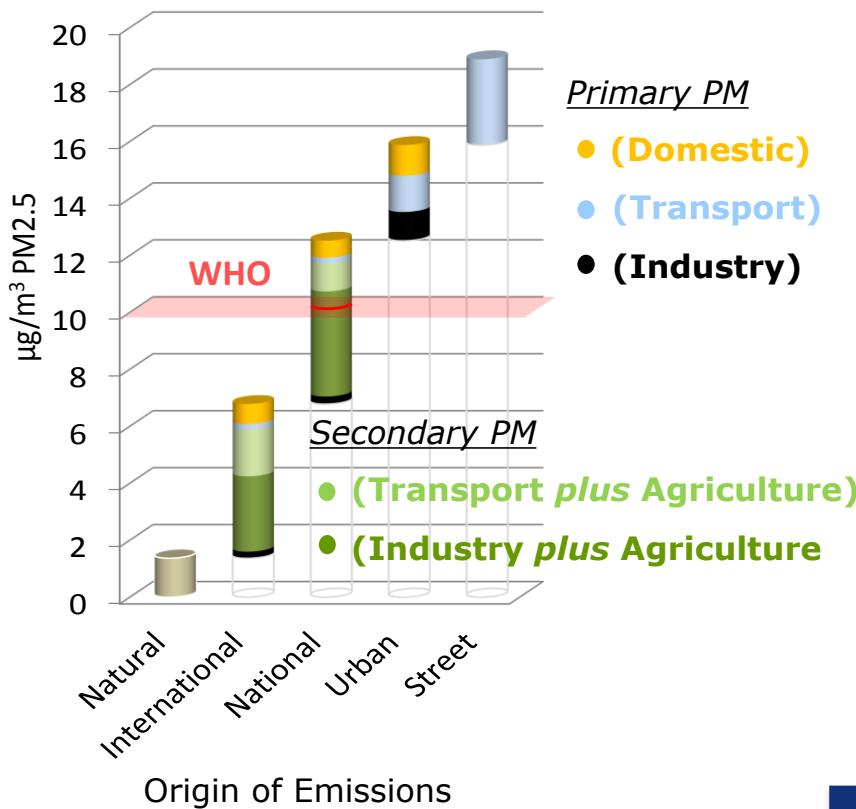


eutrophication

Who and what causes air pollution?

Particulate Matter (PM_{2.5})

e.g. Germany, 2009 -



Sulphur dioxide (SO₂)

- Energy sector, Transport, ...

Nitrogen oxides (NO_x)

- Transport, Energy, Industry, ...

Ammonia (NH₃)

- Agriculture (Livestock & Fertilizers), ...

Volatile Organic Compounds (VOC)

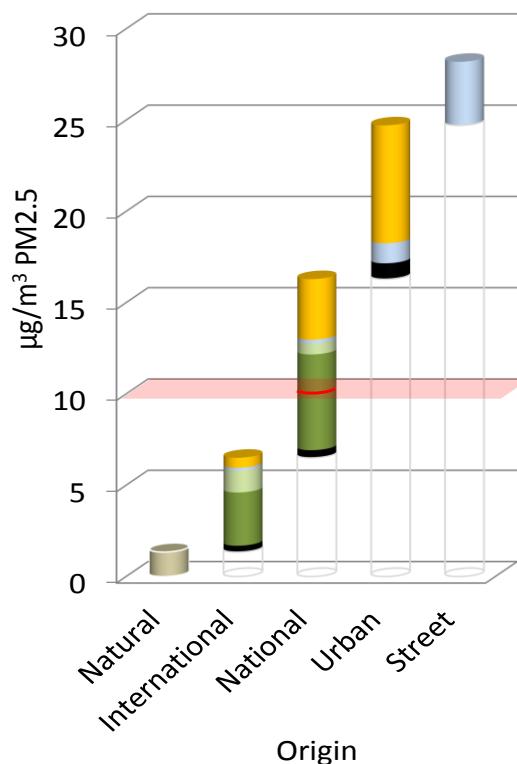
- Solvents, Paints, Transport, ...

Methane (CH₄)

- Agriculture, Waste, Energy, ...

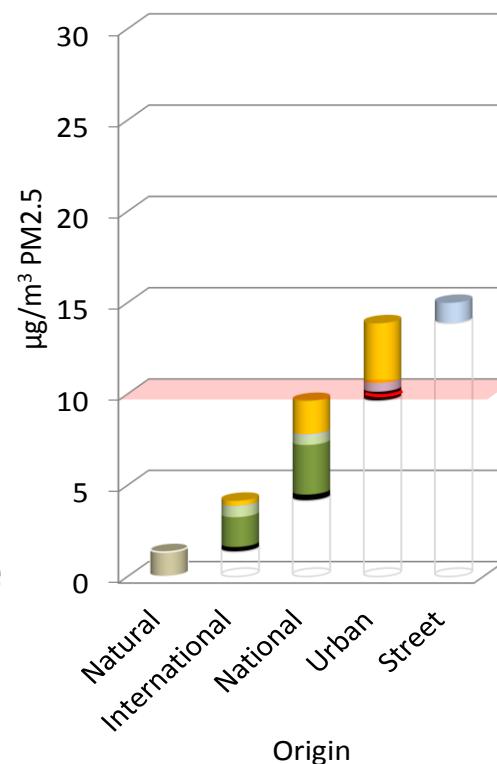
PM2.5 in Poland: average of 142 urban AIRBASE stations modelled in GAINS

2009



2030 Commission proposal

- Households
- Primary PM: Traffic
- Sec. PM: Traffic + agri.
- Sec. PM: Industry + agri
- Primary PM: Industry
- Natural
- WHO guideline value



Source: IIASA GAINS (Kiesewetter et al., 2014)



Clean Air Policies in Europe – An Overview

The international context

- UN ECE Convention on Long-Range Transboundary Air Pollution (CLRTAP) and its Protocols (e.g. Gothenburg Protocol for 2010 and 2020)

The main European Union air policy instruments

- Ambient Air Quality Directives (AAQD): Maximum concentrations to be attained across the EU (SO₂, NO₂, PM₁₀, benzene, lead, CO, O₃, arsenic, cadmium, nickel, PM_{2.5} and BaP)
- National Emission Ceilings Directive (NECD): National emission inventories and caps to limit transboundary pollution (SO_x, NO_x, NMVOC, and NH₃)
- Source-specific performance standards: Euro and fuel standards, Industrial Emissions Directive, energy efficiency standards, etc.

The main Member States air policy instruments

- Air Quality Plans & Programmes (AAQD)
- National Emission Inventories, Projections, and Measures (NECD)
- ...



Clean Air Programme 2013 - Strategic Ambitions

Year	Health impact (premature deaths) reduction vs 2005	Ambient air quality standards and compliance
2020	33%	Full compliance with existing ambient air quality legislation (including NO ₂ , PM10 and PM 2.5)
2030	52%	Most Member States would reach PM 2.5 levels below or close to the WHO guidelines of 10 µg/m ³



Ambient Air Quality Directives

The Ambient Air Quality Directives requires Member States to have **Air Quality Plans** to keep exceedance periods as short as possible.

Regarding **NO2**: 19 Member States have reported excess levels in 2014, and infringement proceedings have already been opened against 9 Member States.

Regarding **PM10**: 16 Member States are facing infringement actions at various stages. First cases have been brought to Court.

Regarding **PM2.5**: Annual limit value applies as of 1 January 2015.

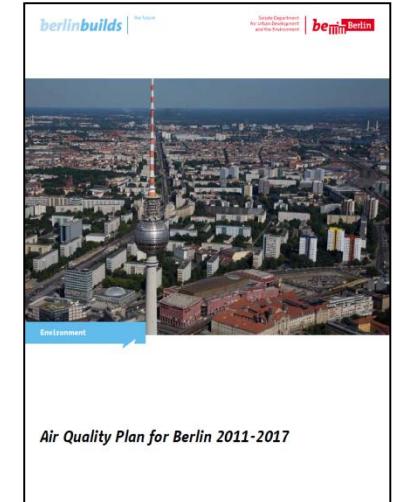
Directive '**kept under review**', with a view to revision once the NECD is agreed.



Air Quality Plans and Air Quality Measures

Air quality plans are to be developed where there are exceedances, and shall include the following:

- General information and details on measuring stations
- Nature and assessment of pollution (incl. trends)
- Techniques used for air quality assessments
- Origin of pollution (incl. source apportionment)
- Details of measures and estimate of improvement of air quality planned, and the expected time required





Improving Air Quality

Emission sources: heating, transport, agriculture, industry, power generation

Options: reduction of emissions (preferred) and dispersion

Some important issues:

- subsidiarity
- relation with Air Quality Plans under Directive 2008/50/EC
- correct data on emission sources and concentrations (monitoring, modelling)
- horizontal and vertical coherence in policy development and implementation
- building on existing info, best practices and legislation
(e.g. EEA/ENV Air Implementation Pilot, LIFE projects, Ecodesign)
- dissemination
- quantification of effects (cost-benefit)
- stakeholders (cities, NGOs, citizens, ...)



Improving Air Quality and the LIFE IP for Air

Some important characteristics:

- regional, national and international cooperation and dissemination
- excellent mobilisation of additional funding (e.g. from Structural Funds)
- good link with the development and implementation of Air Quality Plans
- building on existing info and best practices
- addressing energy and transport

Points of attention:

- energy efficiency (e.g. reducing heat demand in single houses reduces both PM and NO₂)
- role of agriculture
- regional and local competences for addressing air pollution (e.g. LEZ, urban planning, conditional building permits, fuel control/ban,)
- tools and willingness to address local and regional hotspots for the best cost-benefit ratio
- synergies with other policies, e.g. urban planning



EU support for improving Air Quality

Financial

Generally co-funding:

- ESIF ("Structural Funds")
- LIFE (traditional projects and Integrated Projects)
- Horizon 2020 (e.g. transport, energy, health, climate action, agriculture)

Loans/financial instruments:

- EIB and EFSI ("Juncker Fund")

Information and dissemination

-EEA

<http://www.eea.europa.eu/publications/air-quality-in-europe-2015>

-LIFE and air quality brochure

<http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/airquality.pdf>

-Database of Air Quality measures (JRC/ENV)

-Clean Air Forum (2017)

Cleaner Air For All Infographic

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ENVIRONMENT

European Commission > Environment > Air

Cleaner air for all

Every year, more than 400 000 people in the EU die prematurely due to the consequences of air pollution; this is more than 10 times the toll of road traffic accidents. Another 6.5 million people fall sick as air pollution causes diseases such as asthma, asthma and bronchitis. Air pollution also affects our environment, impacting both vegetation and wildlife; almost two-thirds of Europe's ecosystems are threatened by the effects of air pollution.

It is time to act to prevent further damage. Find out below how the European Commission proposes to address air pollution in Europe.

introduction
air pollutants
effects
sources
origins
action
benefits
toolbox



origins of air pollution

Where do air pollutants come from?

Pick your situation to see how much fine particulate matter ($PM_{2.5}$) on average could be in the air you breathe where you live. This provides you with a simulation of what you may experience. Note that these are just general figures and do not give the actual situation.

Choose a country and your situation.

Germany

18.9 $\mu\text{g}/\text{m}^3 PM_{2.5}$ The EU limit value for $PM_{2.5}$: $< 25 \mu\text{g}/\text{m}^3 PM_{2.5}$ WHO guidelines suggest: $< 10 \mu\text{g}/\text{m}^3 PM_{2.5}$

Natural Sources (1.4 $\mu\text{g}/\text{m}^3 PM_{2.5}$)
 International (1.4 $\mu\text{g}/\text{m}^3 PM_{2.5}$)
 National (0.7 $\mu\text{g}/\text{m}^3 PM_{2.5}$)
 Urban (2.4 $\mu\text{g}/\text{m}^3 PM_{2.5}$)
 Street (2.0 $\mu\text{g}/\text{m}^3 PM_{2.5}$)

origins

→ Natural Sources
 → Industry
 → Traffic
 → Households
 → Secondary PM (Agric + Ind + Traff)

+ Back

air pollutants

What are the main air pollutants?

Primary air pollutants
 are directly emitted into the atmosphere e.g. from vehicle exhausts or cleaning:

Click on the images to find out more about each air pollutant.

Particulate matter (primary), Sulphur dioxide, Nitrogen (dioxide), Ammonia, Volatile organic compounds, Methane

Secondary air pollutants
 are formed in the atmosphere through oxidation and reactions between primary air pollutants.

Particulate matter (secondary), Ozone

Source: Air pollution, European Environment Agency

Why is methane not part of this infographic?

Source: Air quality in Europe – 2014 report, European Environment Agency

sources of air pollution

What are the main sources of primary air pollutants?

Click on each air pollutant to see its main source or sources; or click on the sources to see the air pollution it causes.

PM, SO₂, NO_x, NH₃, VOC, CH₄

Sources

electricity and heat production, commercial/household heating, industrial and construction activities, petroleum refining and storage, road transport, non-road mobile machinery, agriculture, other

Sources: European Union emissions inventories

benefits of taking action

How would the proposed Clean Air Policy Package improve health, the economy and the environment?

The total cost to implement the Clean Air Policy Package is estimated at about €2.2 billion a year by the time we reach 2030. However, about €6.3 billion a year could be saved in direct costs otherwise caused by air pollution, plus a further €40 to €140 billion in indirect costs (for example, related to improvements in people's health). This means that the expected benefits to society are more than 20 times the cost of implementing the legislation.

Slide the button to see what could happen in 2030.

Now 2030: If the new Clean Air Policy Package becomes EU rules

Health

Life expectancy shortened by: 4.1 months

Life expectancy extended by 3.3 months

224 000 Premature deaths

Economic costs of air pollution

crop yield loss, working days lost due to sickness, direct healthcare, damage to buildings

Environment



More Information

<http://ec.europa.eu/environment/air/>

Feedback

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Thank you!

European Commission

DG ENV C.3

Air