



# Air quality in Europe

LIFE IP PREPAIR event

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# 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.

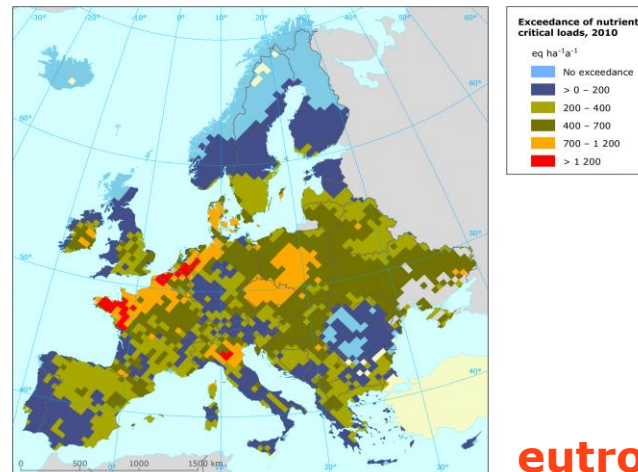
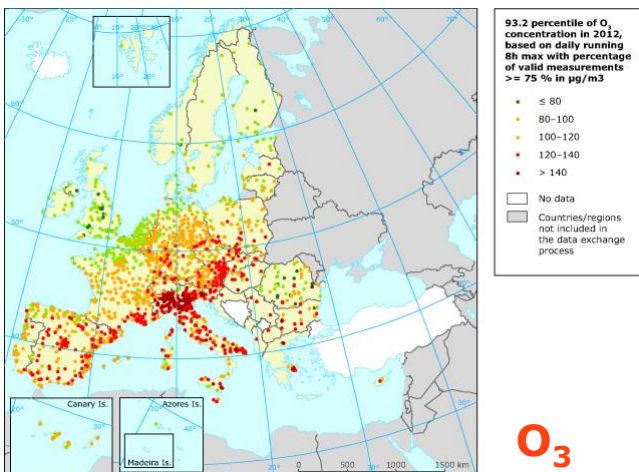
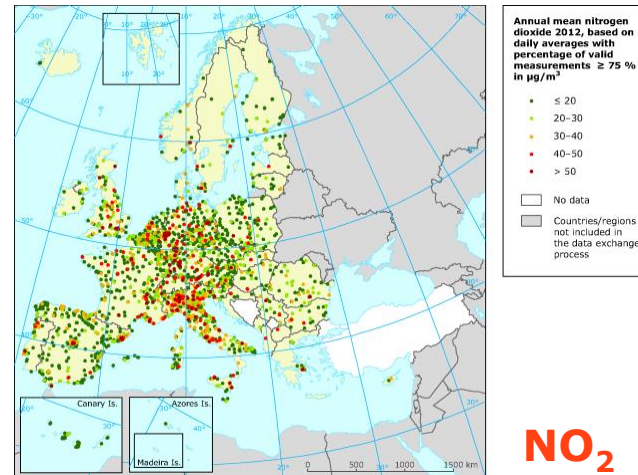
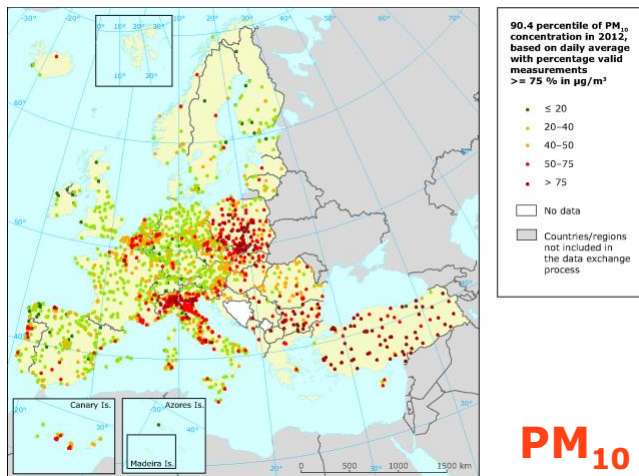


63%

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



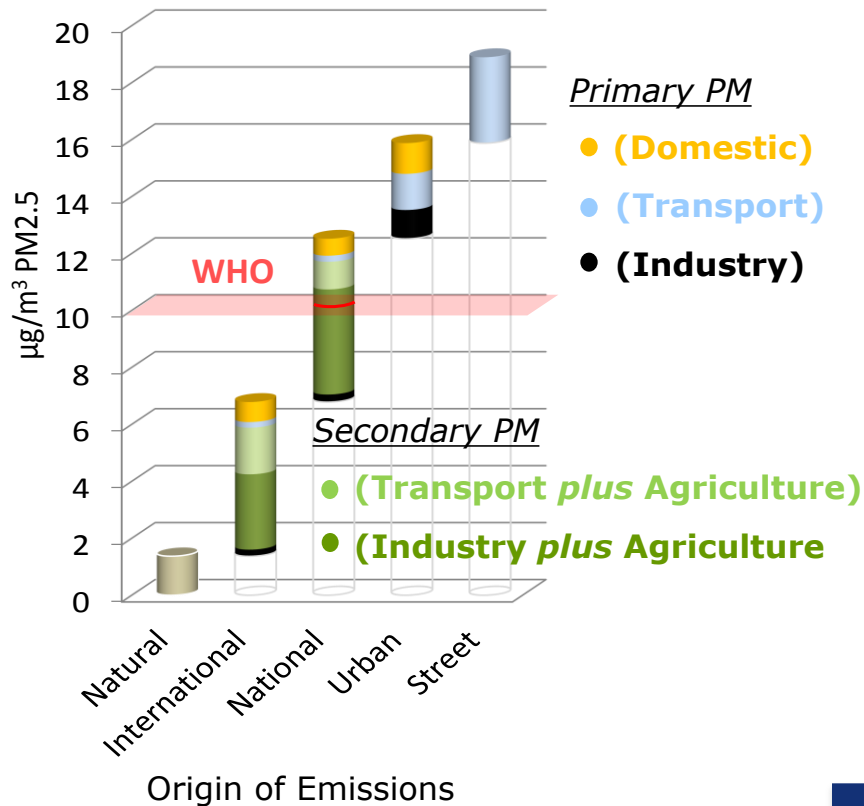
# Where is air pollution a problem?



# Who and what causes air pollution?

## Particulate Matter (PM<sub>2.5</sub>)

e.g. Germany, 2009 -



## Sulphur dioxide (SO<sub>2</sub>)

- Energy sector, Transport, ...

## Nitrogen oxides (NO<sub>x</sub>)

- Transport, Energy, Industry, ...

## Ammonia (NH<sub>3</sub>)

- Agriculture (Livestock & Fertilizers), ...

## Volatile Organic Compounds (VOC)

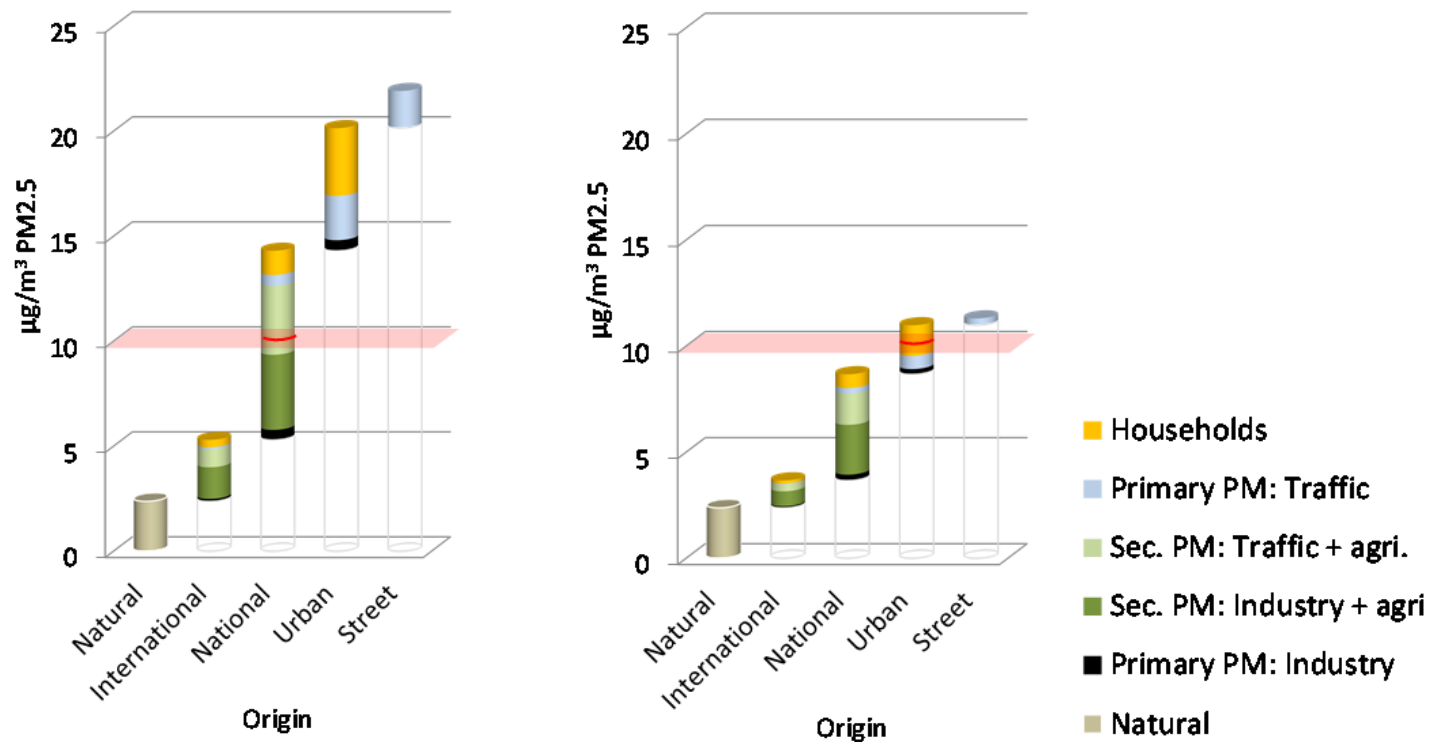
- Solvents, Paints, Transport, ...

## Methane (CH<sub>4</sub>)

- Agriculture, Waste, Energy, ...



## PM2.5 in Italy: average of 70 urban AIRBASE stations modelled in GAINS



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 (SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub>, benzene, lead, CO, O<sub>3</sub>, arsenic, cadmium, nickel, PM<sub>2.5</sub> and BaP)
- **National Emission Ceilings Directive (NECD)**: National emission inventories and caps to limit transboundary pollution (SO<sub>x</sub>, NO<sub>x</sub>, NMVOC, and NH<sub>3</sub>)
- **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, NAPCP (NECD)
- ...

# Clean Air Programme 2013 - Strategic Ambitions

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



# 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 **NO<sub>2</sub>**: infringement proceedings have already been opened against 12 Member States.

Regarding **PM<sub>10</sub>**: 16 Member States are facing infringement actions at various stages. First cases have been brought to Court.

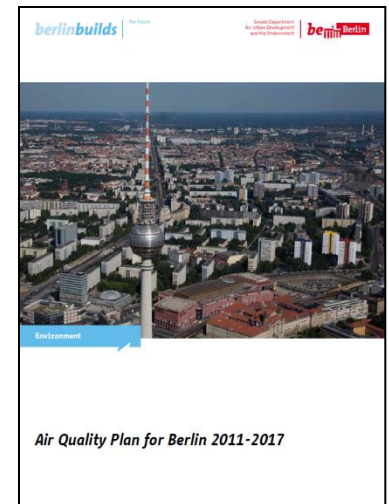
Regarding **PM<sub>2.5</sub>**: Annual limit value applies as of 1 January 2015.

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 NO<sub>2</sub>)
- 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 (1)

## Financial

### *Generally co-funding:*

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

### *Loans/financial instruments:*

- EIB and EFSI ("Juncker Fund")

# EU support for improving Air Quality (2)

## Information and dissemination

-EEA:

<https://www.eea.europa.eu/publications/air-quality-in-europe-2016>

-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 (from 2017)

-Clean Air Dialogues (from 2017)

-EU Environmental Implementation Review

-REGIO and ENV C3:

[https://ec.europa.eu/info/eu-regional-and-urban-development/cities/priority-themes/air-quality-cities\\_en](https://ec.europa.eu/info/eu-regional-and-urban-development/cities/priority-themes/air-quality-cities_en)





European Commission

# Cleaner Air For All Infographic

European Commission | 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 5.5 million people fall sick as air pollution causes diseases such as strokes, asthma and bronchitis. Air pollution also harms our natural 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

## air pollutants

### What are the main air pollutants?

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

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

- PM: Particulate matter (primary)
- SO<sub>2</sub>: Sulphur dioxide
- NO<sub>x</sub>: Nitrogen (dioxide)
- NH<sub>3</sub>: Ammonia
- VOC: Volatile organic compounds
- CH<sub>4</sub>: Methane

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

- PM: Particulate matter (secondary)
- O<sub>3</sub>: Ozone

**Important**  
Other air pollutants can also cause severe damage to human health and the environment. These include heavy metals (such as mercury, arsenic, lead, cadmium and nickel) and polycyclic aromatic hydrocarbons (such as benzopyrene). The existing legislation has already helped to significantly reduce the emissions of these pollutants, resulting in a greatly reduced health risk.

Source: Air pollution, 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.

**Sources**

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

Source: Eurostat; Union emission inventory

## origins of air pollution

### Where do air pollutants come from?

Pick your situation to see how much fine particulate matter (PM<sub>2.5</sub>) 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 µg/m<sup>3</sup> PM<sub>2.5</sub>

The EU limit value for PM<sub>2.5</sub> - 25 µg/m<sup>3</sup> PM<sub>2.5</sub>  
WHO guidelines suggest: 10 µg/m<sup>3</sup> PM<sub>2.5</sub>

**origins**

- Natural Sources (1.4 µg/m<sup>3</sup> PM<sub>2.5</sub>)
- Industry (0.4 µg/m<sup>3</sup> PM<sub>2.5</sub>)
- Traffic (1.0 µg/m<sup>3</sup> PM<sub>2.5</sub>)
- Households (0.5 µg/m<sup>3</sup> PM<sub>2.5</sub>)
- Secondary PM (Ags + Ind + Traff) (5.5 µg/m<sup>3</sup> PM<sub>2.5</sub>)

Scenarios: busy street, quiet street, rural area

## action to reduce air pollution

### What are the means to reduce air emissions over the next 15 years?

In 2013, the EU proposed a Clean Air Policy Package to further reduce emissions of air pollutants until 2030. Slide the buttons to see how these reductions might be achieved.

Slide the buttons to see how these reductions might be achieved.

- through anticipated change in social and economic patterns
- through existing air pollution legislation
- through additional measures to control air pollution

Current EU and national anti-pollution laws and policies have done (and still do) much to reduce air pollution. Changes in our energy systems, such as the decline in the use of solid fuels like wood and coal, also help. The current trends, however, are not sufficient to safeguard human health and the environment. We have to take further action.

**action**

- PM: -63%
- SO<sub>2</sub>: -80%
- NO<sub>x</sub>: -65%
- NH<sub>3</sub>: -25%
- VOC: -46%

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

## 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 €3.3 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.

New 2020 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 (2020) | = 1000 Lives

**Economic costs of air pollution**

- crop yield loss
- workdays 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