# Clean Air in Europe

# Challenges and EU Policy

19 March 2019

European Commission
Clean Air

# Why is air pollution in Europe still a problem?

Europe's **air quality is improving**; between 2000 and 2016 emissions of $NH_3$ decreased by 9%, and of $SO_2$ emission even by 76% … **yet still** there are

| | |
|---|---|
| **Health impacts:** | More than 400.000 premature deaths each year<br>17% of all lung cancer deaths are due to air pollution<br>Citizens exposed to persistent exceedances (e.g. $PM_{2.5}$) |
| **Economic impacts:** | More than € 24 billion per year in 'direct costs';<br>plus € 330 to € 940 billion per year in 'indirect costs' |
| **Environmental impacts:** | Eutrophication limits exceeded in 72% of ecosystem area in the EU, and in 78% of Natura2000 area |

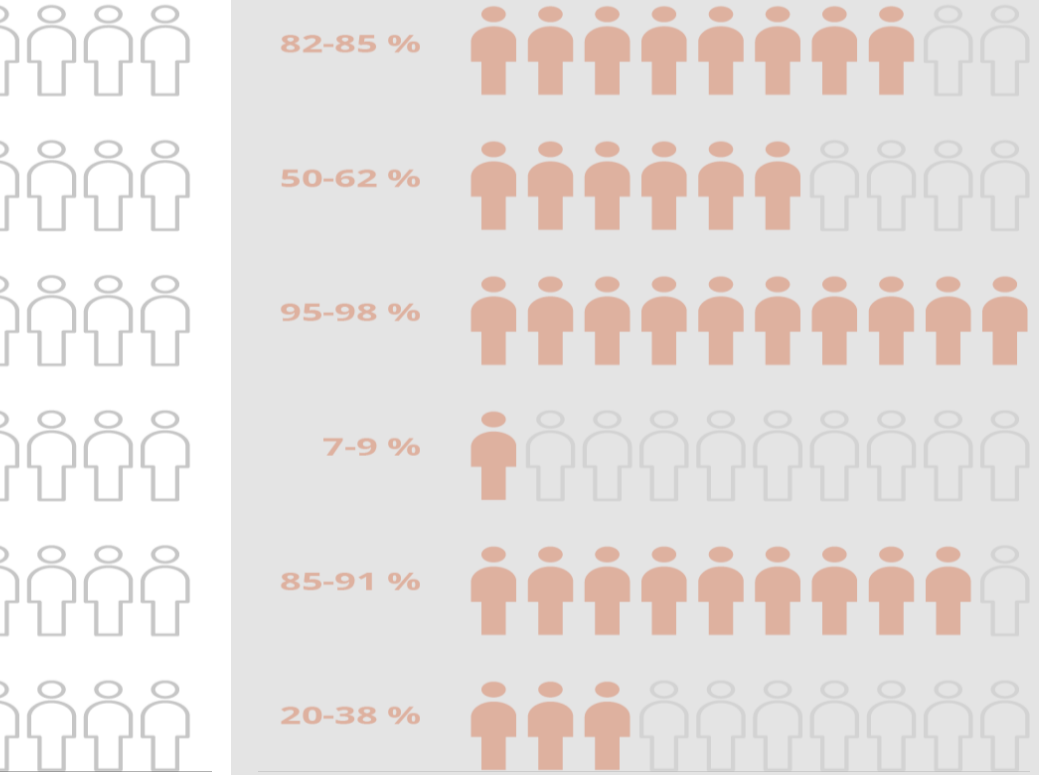
Source(s): EEA (2018), WHO (2017)

# EU air quality standards to protect human health

| Pollutants | WHO Guidelines | EU Standards | EU "Exceptions" | Selected Others |
|---|---|---|---|---|
| **$PM_{10}$ (annual)** | **20 µg/m³** | **40 µg/m³** | - | **CH:20; NO:25 US: 50; CN: 40/70** |
| **$PM_{10}$ (daily)** | **50 µg/m³** | **50 µg/m³** | **(35d a year)** | **CH: 50 (3d); NO: 50 (30d); AUS: 50 (5d); US: 150 (1d)** |
| $PM_{2.5}$ (annual) | 10 µg/m³ | 25 µg/m³ | - | AUS: 8; CH: 10; CAN: 10 US: 12; NO: 15; JP: 15 |
| $PM_{2.5}$ (daily) | 25 µg/m³ | - | - | AUS: 25; CAN: 28; US: 35 (6d) |
| **$NO_2$ (annual)** | **40 µg/m³** | **40 µg/m³** | - | **CH: 30; CAN: 32; CN:40; AUS: 57; US: 100 (SE:20)** |
| **$NO_2$ (hourly)** | **200 µg/m³** | **200 µg/m³** | **(18d a year)** | **CAN: 115; US: 190 (2%); CN:200; AUS: 230 (1d)** |
| $SO_2$ (daily) | 20 µg/m³ | 125 µg/m³ | (3 days a year) | AUS: 80; CH:100 (1d); CN: 50/150 |
| $SO_2$ (10m/hourly) | 500 µg/m³ | 350 µg/m³ | (24 hours a year) | US: 200 (1%); NZ: 350 (9h) AUS: 530 (1d) |
| **$O_3$ (8-hour mean)** | **100 µg/m³** | **(TV) 120 µg/m³** | **(75d in 3 years)** | UK: 100 (10d); CAN: 126; US: 140 |
| Benzo(a)Pyrene | 0.12 ng/m³ | (TV) 1 ng/m³ | - | NO: 0.1; SE: 0.1; CN: 1 |
| **CO (8-hour mean)** | **10 mg/m³** | **10 mg/m³** | - | **CH: 8 (1d); US: 10; NZ: 10; CN: 10** |

# And yet, air pollution remains a health challenge

| | EU urban population exposed to air pollution **above EU standards** | EU urban population exposed to air pollution **above WHO guidelines** |
|---|---|---|
| $PM_{2.5}$ | 7-8 % | 82-85 % |
| $PM_{10}$ | 16-20 % | 50-62 % |
| $O_3$ | 7-30 % | 95-98 % |
| $NO_2$ | 7-9 % | 7-9 % |
| BaP | 20-25 % | 85-91 % |
| $SO_2$ | < 1 % | 20-38 % |



Source(s): For 2013-2015; EEA Air Quality in Europe (2017)

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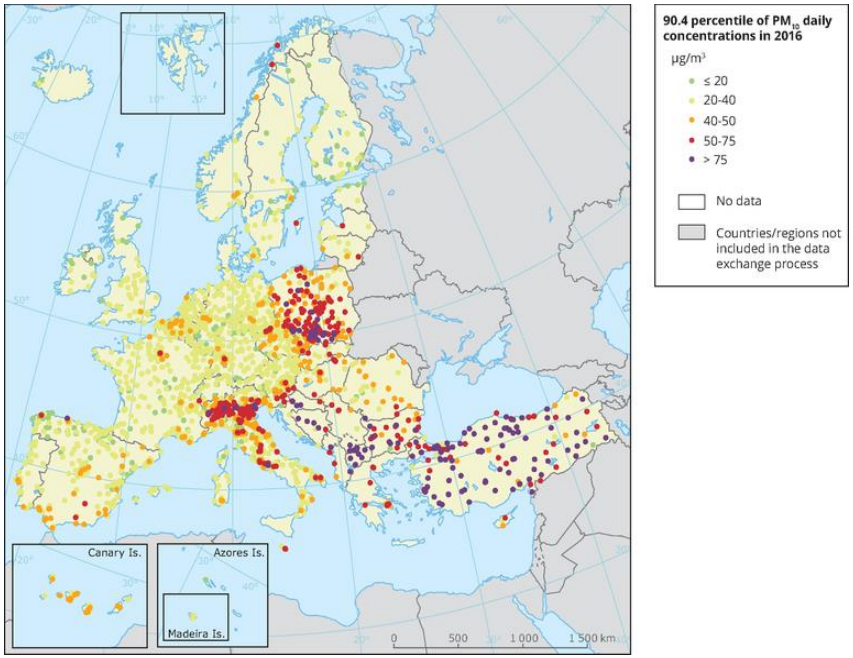
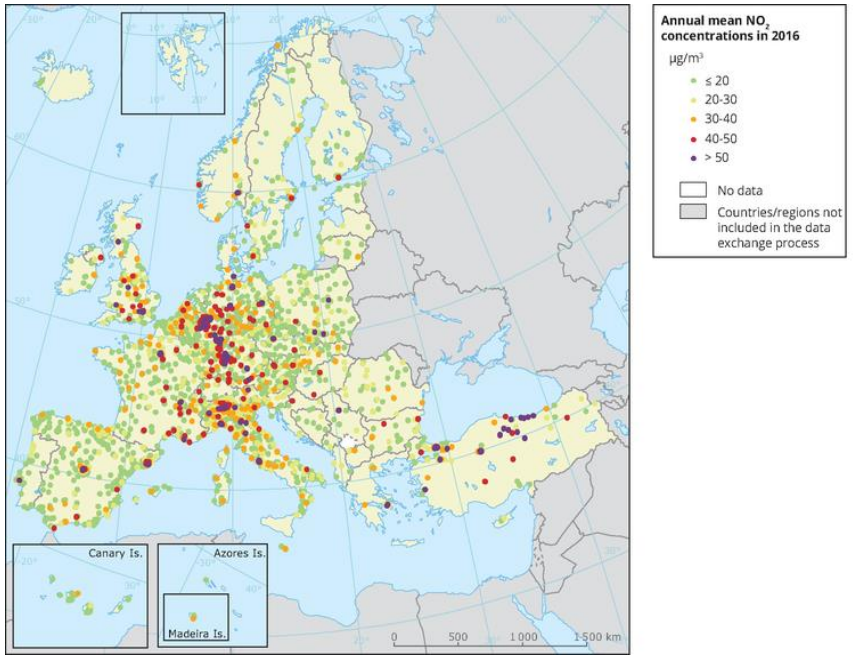
# Where is air pollution in Europe a problem?

**$PM_{10}$ exceedances** are often linked to fuel combustion (i.e. heating, transport)




**NO2 exceedances** are often linked to traffic, in more than 130 cities in EU.




Source(s): EEA Air Quality in Europe (2018)

# Who and what causes air pollution in Europe?

**Air pollution has multiple sources …**

**$PM_{2.5}$:** Households et al (56%), Energy & Industry (22%); Transport (13%),…

**$NO_x$:** Transport (48%), Energy (17%), Industry (14%), Households et al (14%), …

**$SO_x$:** Energy (51%), Industry (29%), Households et al (17%), Transport (3%), …

**$NH_3$:** Agriculture (92%), …

**… and originates across all scales**

- Transboundary pollution
- National level background
- City level sources
- Road-side peaks

**This combination requires EU Clean Air Policy to address all sectors & all scales**

Source(s): EEA Air Quality in Europe (2018)


Our Aim
Cut emissions, so as to halve health impacts in the EU by 2030 (vs 2005)

European Commission

Communication COM(2018)330

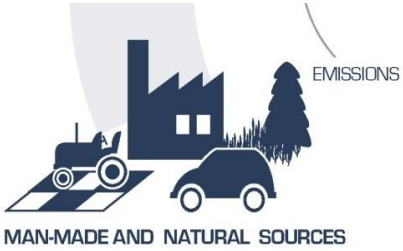
# Clean air for all … EU policy framework


## SETTING OBJECTIVES FOR GOOD AIR QUALITY

### Ambient Air Quality Directives

Maximum concentrations of air polluting substances ($PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_2$, CO, $O_3$ + 6 more)

## REDUCING EMISSIONS OF POLLUTANTS




### National Emission Ceilings Directive

National emission totals ($SO_2$, $NO_x$, VOC, $PM_{2.5}$, $NH_3$)

-79% -63% -40% -49% -19%

EU-28 reduction targets btw. 2005 and 2030

### Source-specific emission standards

- IED Directive
- MCP Directive
- Eco-design Directive
- Energy efficiency
- Euro and fuel standards

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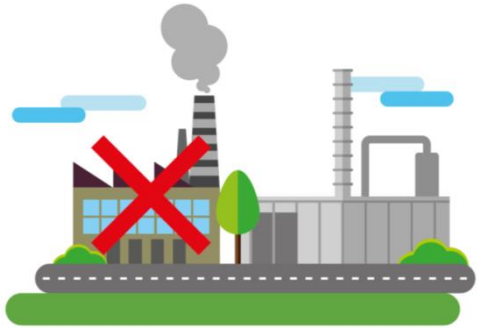
# Clean air for all … there are effective measures

## Examples for $PM_{10}$

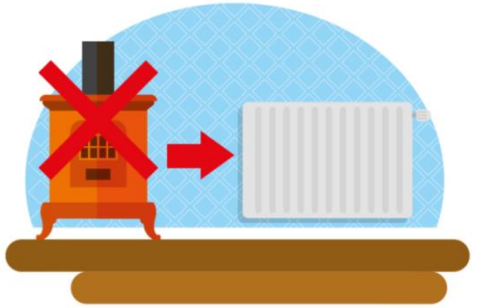
Boosting **energy efficiency** by refurbishing buildings



Implementing **cleaner industrial processes**

Reliable, affordable and clean **public transport** such as electric buses and trams and new Euro VI

**City or district heating**, using heat from existing industry or renewable energy sources



Promoting substitution of old, dirty **stoves and boilers** with clean models, and banning **dirty fuels for household heating/cooking**

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# Clean air for all … there are effective measures

Reliable, affordable and clean **public transport** such as electric buses and trams and new Euro VI

## Examples for $NO_2$


Extensive and safe **cycling networks**, abundant bike-parking facilities with easy access to public transport


**Traffic restrictions** such as low-emission zones, reduced speed limits and congestion charges

Implementing **cleaner industrial processes**

**Cleaner transport** such as electric cars or buses and **retrofitted dirty vehicles and ships**

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# Clean air for all … and related EU funding

**Cohesion policy** (i.e. Regional Development Fund + Cohesion Fund)

- specific allocations for air quality; € 1.8 billion is available for 2014-2020
- in addition, further indirect contributions can benefit air quality, e.g. low-carbon economy (€ 45 billion), environmental protection and resource efficiency (€ 63 billion) and network infrastructure (€ 58 billion)

**LIFE funding** offers a further € 300 million, including for LIFE Integrated Projects (e.g. for air quality plans) or LIFE preparatory projects (e.g. air quality sensors)

**EFSI funding** offers a total of € 315 billion, of which 30% have a possible air quality link (e.g. investing in energy and transport, or social infrastructure); in addition **Horizon 2020** indirectly benefits emissions reduction and air quality.

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# Clean air for all … continued enforcement action

**Compliance gap** persists – see COM (2018) 330 'Cleaner Air for All'

Regarding **NO2**: 17 Member States with exceedances in 2017 (more than 130 cities); 14 Member States are facing infringement actions.

Regarding **PM10**: 15 Member States with exceedances in 2017; 15 Member States are facing infringement actions; two cases have been decided by the Court.

Regarding **SO2**: 2 Member States with exceedances in 2017; 1 infringement ongoing.

In addition, 2 infringement cases related specifically to monitoring and reporting shortcomings, plus other cases that also address monitoring.

Source(s): AQ Portal, Clean Air Programme

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# Clean air for all… EU implementation support

## Environmental Implementation Review

- Country specific analysis, and targeted EIR dialogues
- Additional tools and funds to improve Peer-2-Peer exchange


## Clean Air Dialogues & Clean Air Forum

- So far, dialogues with 6 Member States: IE, LU, HU, SK, ES, CZ
- First Forum in Nov 2017 (measures in cities, by agriculture, 'clean tech‘)
- Second Forum in Nov 2019 (28 and 29 November 2019)

## Bringing together Member States, regions and cities

- EU Urban Agenda to facilitate cooperation
- Urban Innovative Actions

# Fitness check: Ambient Air Quality Directives

**Scope:** Evidence-based analysis of whether EU actions are fit for purpose, and identify regulatory burdens, overlaps, gaps, inconsistencies

**>>> started in mid-2017 - to be finalized by end of 2019 <<<**

**Evidence:** Literature review: scientific peer-reviewed as well as other reports

Air quality data as reported over the period 2008 to 2018 to EEA

General stakeholder consultation (incl. Online PC and 2 workshops)

Targeted stakeholder consultation (incl. questionnaires and interviews)

Seven focus case studies (in BG, DE, ES, IE, IT, SE, SK)

Desk review of EU and national legislation, as relevant

**Purpose:** Retrospective exercise; looking at period 2008 to 2018

**Criteria:** Relevance, Coherence, Effectiveness, Efficiency, EU Value Added

NOT validated by the European Commission

# Fitness check initial findings (support study)

## Relevance & EU Added Value

- Current standards are not as strict as latest scientific evidence would suggest they should be to protect human health (i.e. prevention and precaution).
- AAQDs have streamlined monitoring and reporting improved data collection and stimulated more / additional MS action to improve air quality;

## Coherence

- AAQDs are largely internally coherent (isolated examples where not); overall coherence with other EU Clean Air legislation
- Some incoherence in implementation of sectoral policies identified, i.e. Euro standards real world emissions (diesel), cross-compliance, and bioenergy.

Source(s): Background document for 2nd stakeholder workshop

NOT validated by the European Commission

# Fitness check initial findings (support study)

## Effectiveness

- Air quality has generally improved in the assessment period in all MS- but most MS have reported exceedances for at least one pollutant, even in 2017.
- Several stakeholders noted that the Directives are not prescriptive enough, and allow for degree of interpretation (e.g. for monitoring micro-siting).

## Efficiency

- Data for air quality monitoring indicate a total annual cost across the EU in the order of €0.2 to € 1/person/year (only partly attributable to AAQDs).
- 2008-2016: Health benefits of the AAQDs estimated €25 to 76 bn. But costs of poor implementation (> limit values) are estimated at €100 to 500 bn.

Source(s): Background document for 2nd stakeholder workshop

# Some concluding reflections

COM(2018)330 emphasizes urgent need to improve air quality through **full implementation** of air quality standards – for now, compliance gaps remain.

Reducing air pollution effectively requires **close cooperation** between different societal actors and across governance levels (EU, national, regional, local).

The European Commission continues to **support implementation** by Member States – such as via Clean Air Dialogues, or via funding opportunities.

With the on-going Fitness Check we are seeking to understand what works well, and what could work better: **whether the Directives are fit for purpose**.

# Thank you

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