Clean Air Programme for Europe

Industrial Emissions

17 October 2017

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European Commission
DG ENV C.3
Clean Air

Topic of air pollution high in the public interest











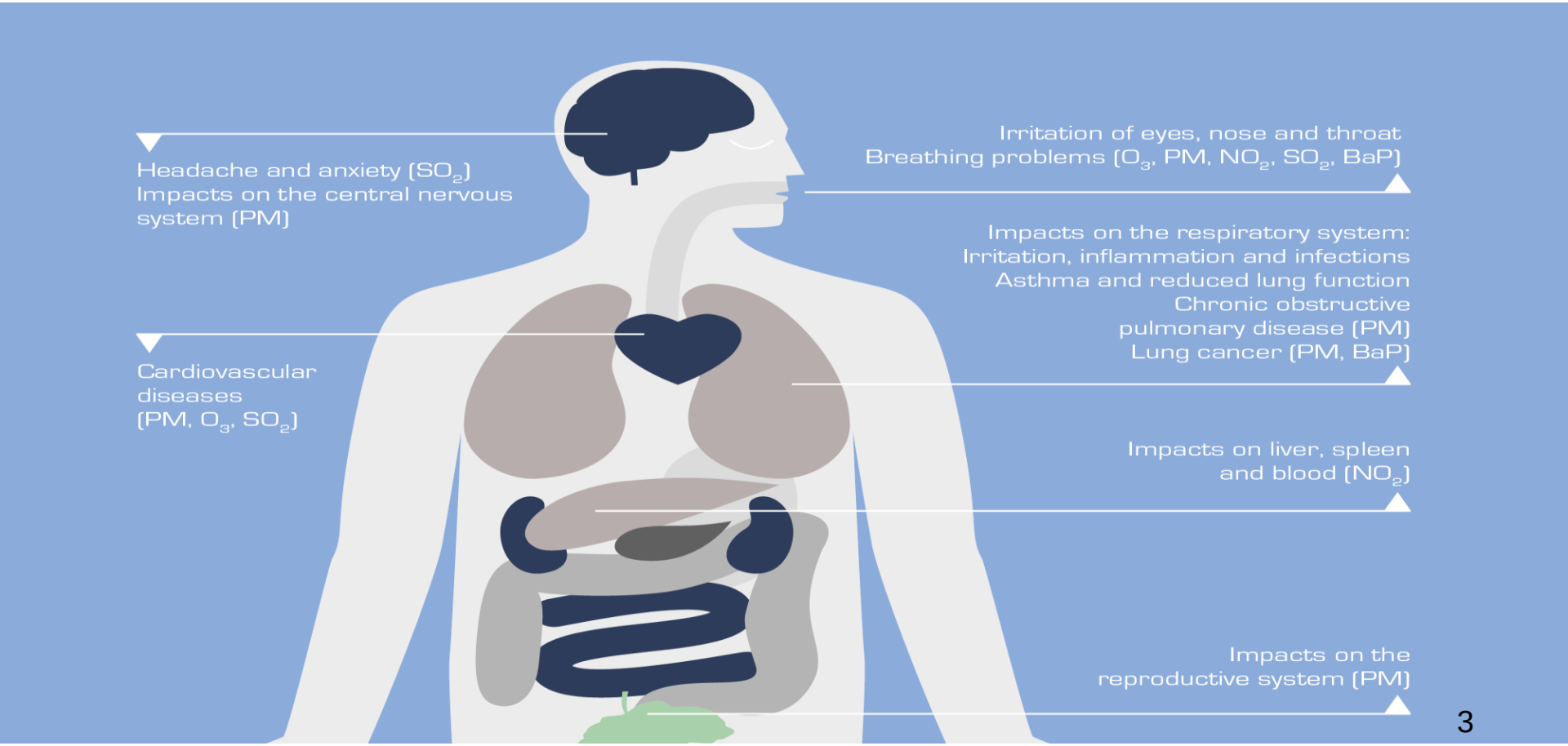






Source(s): Various online and print media

Air pollution affects human health & well-being



Source(s): EEA

Why is air pollution a problem?

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 about **400.000 premature deaths** in EU-28 each year due to particulate matter; 75.000 due to nitrogen dioxide and 13.000 due to ozone.

1 out of 12 citizens in **EU urban areas** exposed to particulate matter ($PM_{2.5}$) above EU limits values; and **8 out of 10** above WHO guidelines



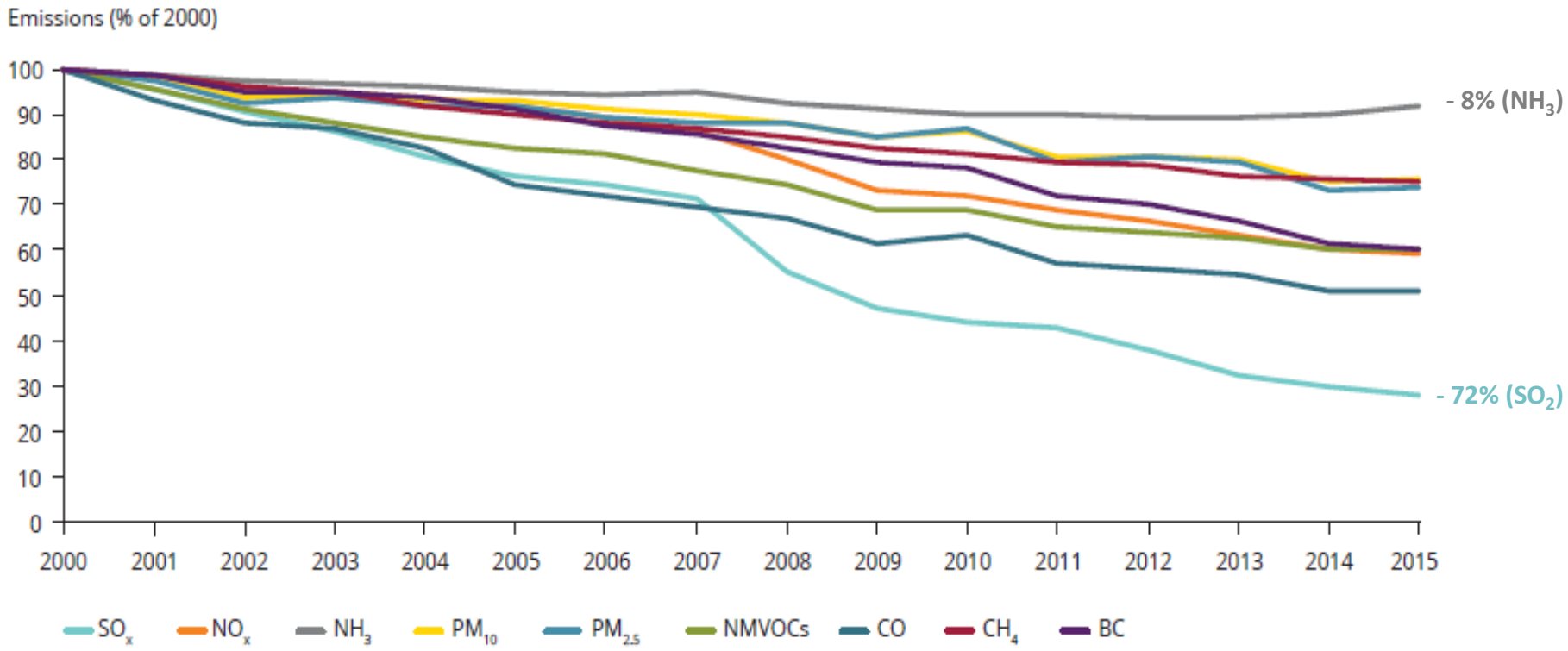
63%

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

Source(s): EEA Air Quality in Europe (2017), SOER (2015)

National Emissions Ceilings Directive

Development in EU-28 emissions, 2000-2015 (as % of 2000 levels)



Source(s): EEA Air Quality in Europe (2017)

Clean Air Policy in Europe - 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, PM_{10} 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

Source(s): Clean Air Programme

Clean Air Policies in Europe – An Overview (1)

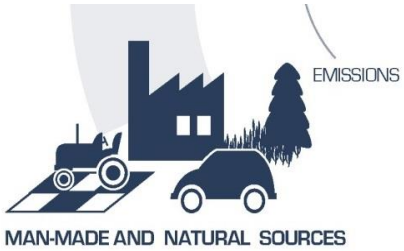


Ambient Air Quality Directives

Maximum concentrations of air polluting substances

CONCENTRATIONS

EMISSIONS



National Emission Ceilings Directive

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

Source-specific emission standards

- Industrial Emissions
- MCP Directive
- Eco-design
- Energy efficiency
- Euro and fuel standards

Clean Air Policies in Europe – An Overview (2)

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

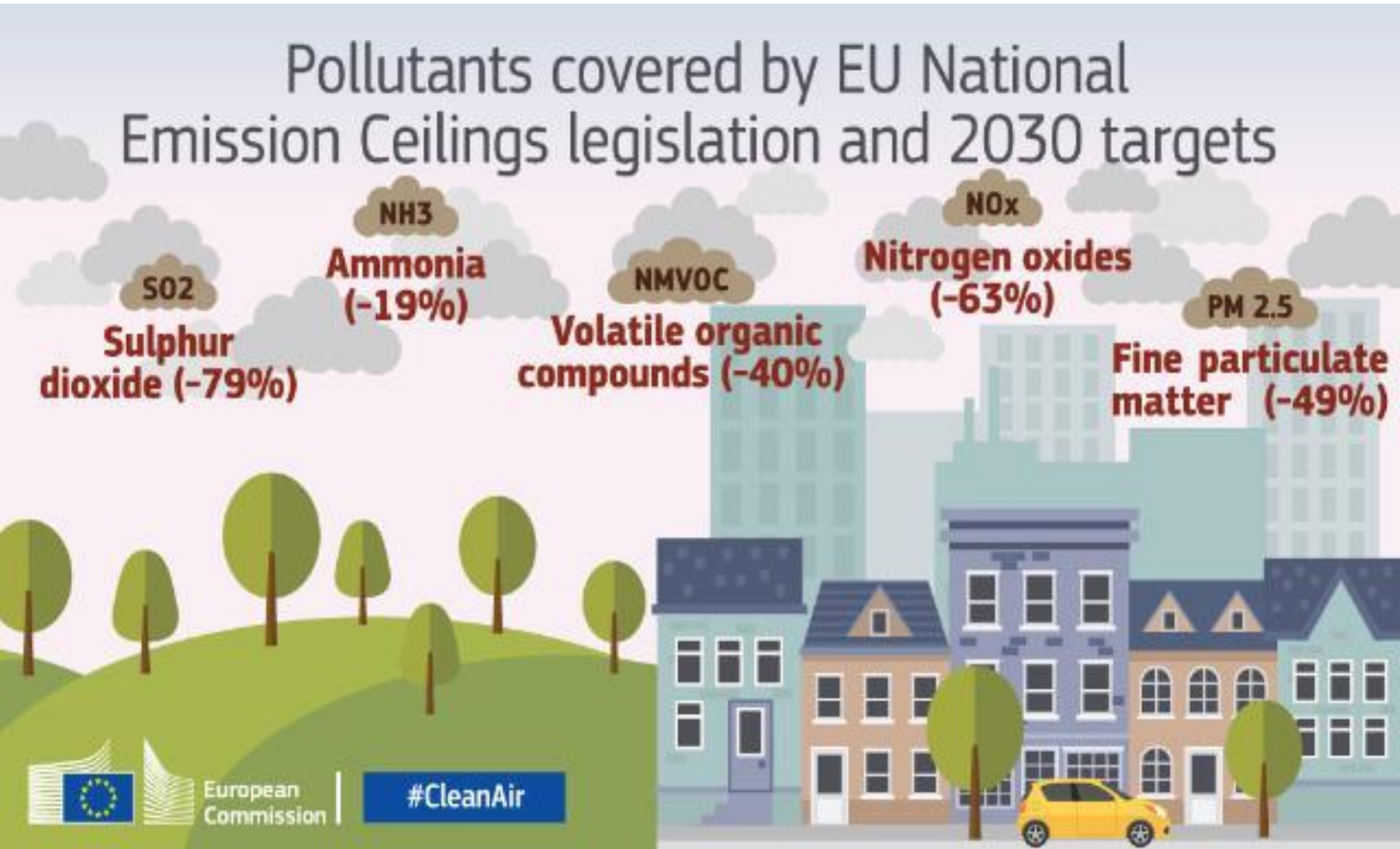
- **Ambient Air Quality Directives** (AAQD): Maximum concentrations to be attained across the EU (SO2, NO2, PM10, benzene, lead, CO, O3, arsenic, cadmium, nickel, PM2.5 and BaP)
- **National Emission Ceilings Directive** (NECD): National emission inventories and caps to limit transboundary pollution (SO2, NOx, NMVOC, PM2.5 and NH3)
- **Source-specific performance standards**: Euro and fuel standards, Industrial Emissions Directive, Medium Combustion Plants Directive, Ecodesign standards, etc.

The main Member States air policy instruments

- Air Quality Plans & Programmes (AAQD)
- National Emission Inventories, Projections, and Measures (NECD)
- Fiscal measures, urban mobility measure, …

European Commission

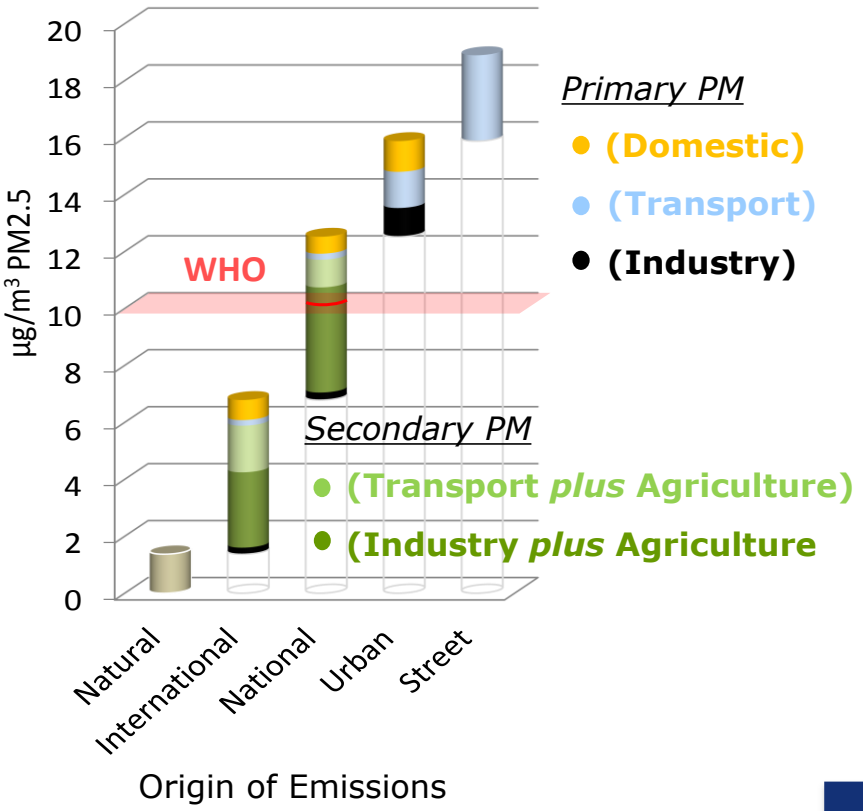
Pollutants covered by EU National Emission Ceilings legislation and 2030 targets



Who and what causes air pollution?

Particulate Matter ($PM_{2.5}$)

e.g. Germany, 2009 -



Sulphur dioxide (SO_2)

- Energy sector, Transport, …

Nitrogen oxides (NO_x)

- Transport, Energy, Industy, …

Ammonia (NH_3)

- Agriculture (Livestock & Fertilizers), …

Volatile Organic Compounds (VOC)

- Solvents, Paints, Transport, …

Methane (CH_4)

- Agriculture, Waste, Energy, …

Source(s): IIASA TSAP 12 Report (2014)

Source-specific performance standards

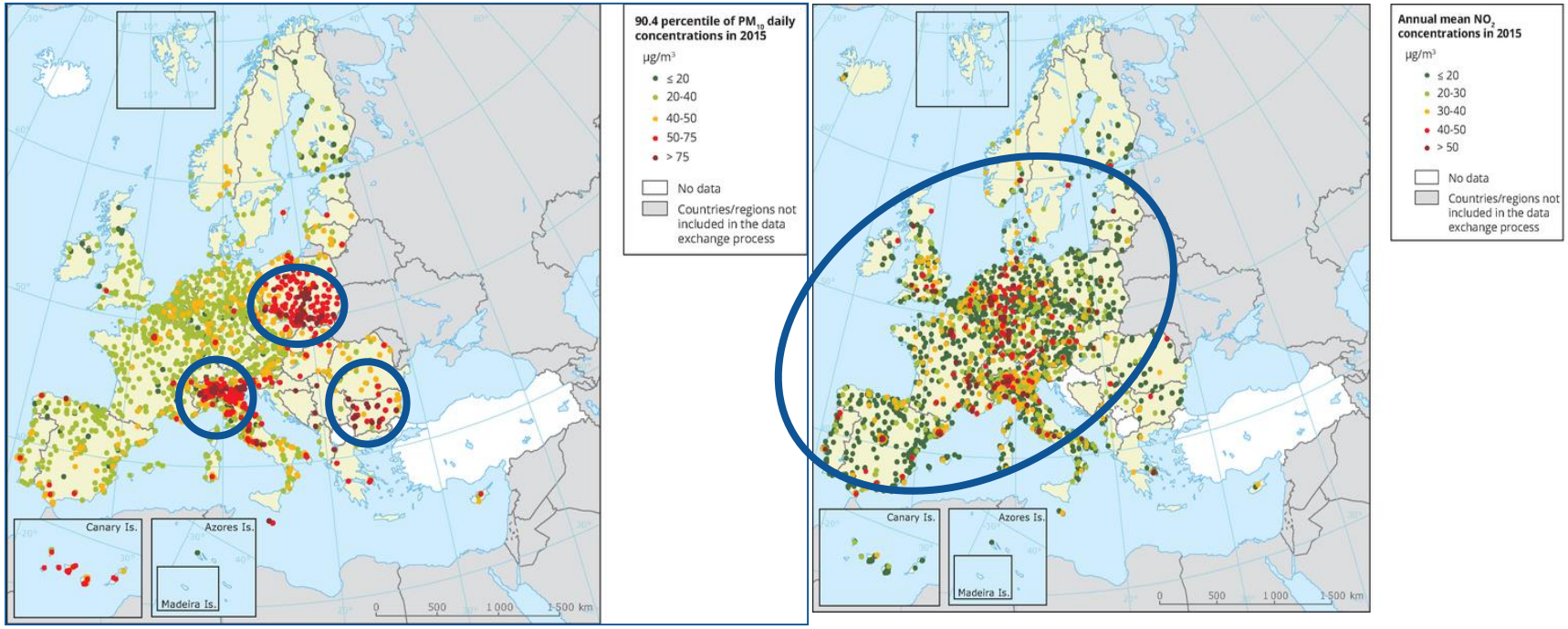
-Ecodesign and Energy Label standards address emissions from smaller heating installations up to 1 MW and reduce electricity consumption in households,
-Medium Combustion Plants Directive addresses installations at 1-50 MW, setting fuel-specific emission limit values (focus on SO2, NOx and PM), …
-Industrial Emissions Directive, Industrial Emissions Performance Standards, BATs and BREFs, …
-Road transport including type approval standards, ensuring real driving emission Euro 6 standards (with conformity factor of 2.1 from 2019, '1.5' from 2021), …
-Non-Road Mobile Machinery (NRMM Directive) type approval standards
-Fuel quality standards (e.g. sulphur in liquid fuels) to reduce shipping emissions …

Source(s): Clean Air Programme, various

Ambient Air Quality Directives

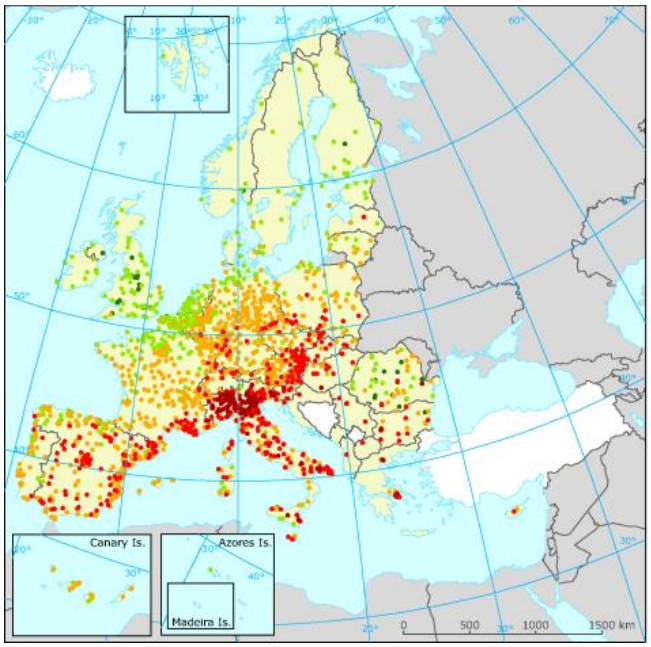
PM10 exceedances: often linked to fuel combustion (i.e. energy, heating)

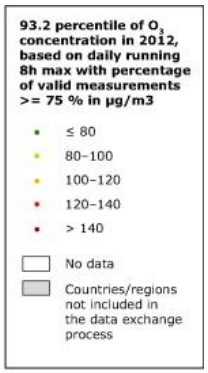
NO2 exceedances: often linked to traffic, in more than 130 cities in EU.

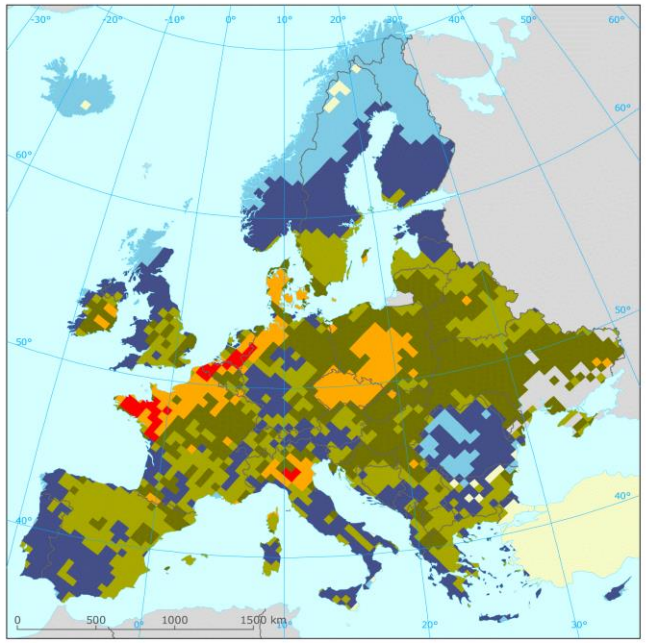


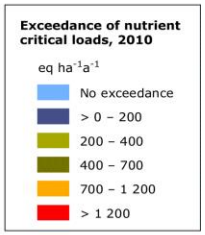
Source(s): EEA Air Quality in Europe (2017)

Where is air pollution a problem?



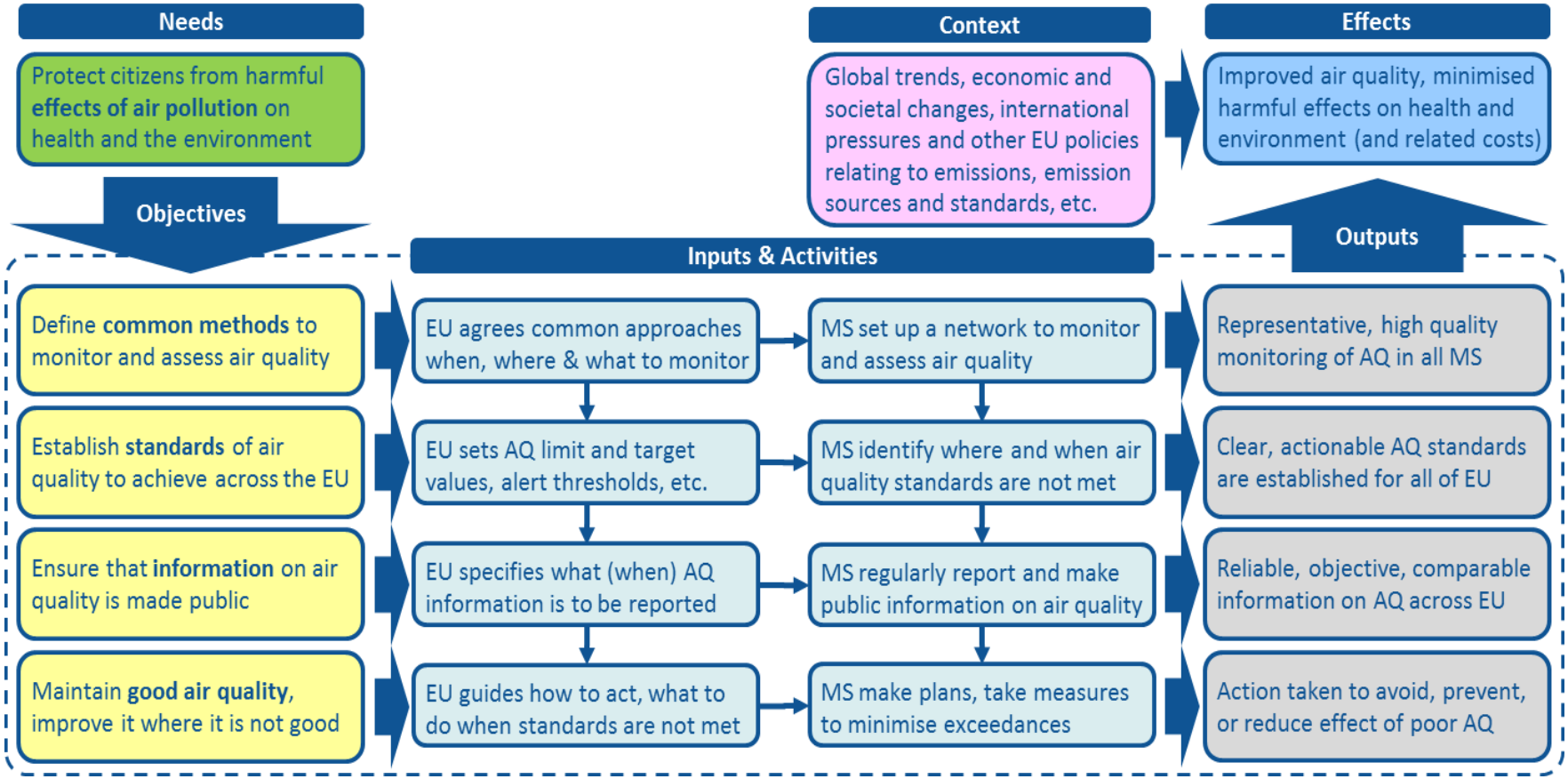






O_3 **eutrophication**

Ambient Air Quality Directives



Source(s): AAQ Fitness Check Road Map

Ambient Air Quality Directives

Compliance gap persists: in 2015, 24 out of 28 Member States exceeded at least the limit value for at least one pollutant at least at one sampling point.

Regarding **NO2**: 21 Member States with exceedances (more than 130 cities); infringement proceedings have been opened against 13 Member States.

Regarding **PM10**: 18 Member States with exceedances; 16 Member States are facing infringement actions; first cases have been brought to Court.

Regarding **PM2.5**: 8 Member States with exceedances.

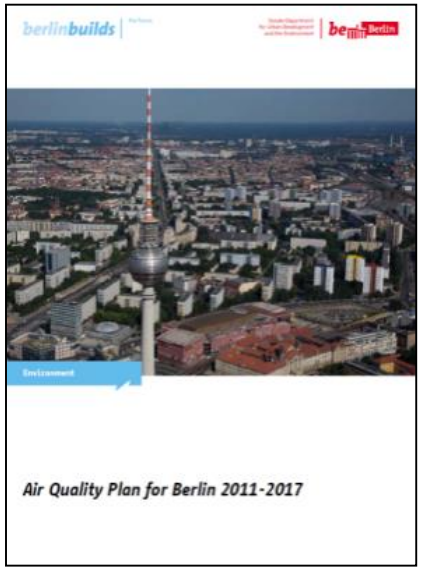
Regarding **SO2**: 2 Member States with exceedances; 1 infringement ongoing.

Source(s): AQ Portal, Clean Air Programme

Improving air quality in cities

The Ambient Air Quality Directive requires Member States / Regions / Cities to have air quality plans to **keep exceedance as short as possible**

- 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 in cities

Some **good practices** for cleaner air in cities (there are many more):



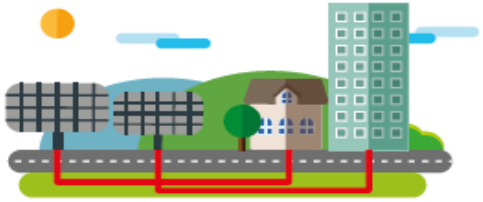
Reliable, affordable and clean **public transport** such as electric buses and trams and new Euro VI or retrofitted buses



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



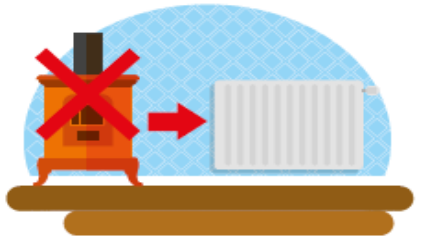
Extensive and safe **cycling networks**, abundant bike-parking facilities with easy access to public transport



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



More **energy-efficient buildings**



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

Improving air quality

Synergies with **energy** policies … e.g. by promoting of renewable energy, and by reducing use of coal by replacing it with cleaner fuels;

Synergies with **agriculture** policies … e.g. by focusing on better livestock and manure management practices, and using low-emission fertilisers;

Synergies with **transport** policies … e.g. by reducing emissions from vehicles, by setting fuel quality standards, by encouraging sustainable mobility options;

Synergies with **urban** policies … e.g. by investing in cleaner transport options, and traffic access conditions that encourage use of low emission vehicles.

Some reflections

Public (and political) awareness of **air quality challenge** has increased – but substantial implementation and compliance gaps remain.

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

Dialogue is key: for example via a **European Clean Air Forum**, bespoke Clean Air Dialogues with Member States and/or platforms like the EU Urban Agenda.

Air quality management, spatial planning and traffic management play a key role in improving local air quality – **cities require support to implement**.

Working together - Clean Air Forum

First **Clean Air Forum** on 16 & 17 November 2017, a two-day event with more than 300 participants and including a high-level segment in the City Hall, Paris.



Focus:

- air quality in cities

- agriculture and air quality

- clean air business opportunities.

Discussion also on key **cross-cutting topics**, such as governance, knowledge base, funding mechanisms, air pollution and climate change, and foresight.

Registrations open now: https://www.euconf.eu/clean-air/

Support for Air Quality policies

- Providing direct or indirect financial support:
  - Structural Funds (e.g. PA, OP, RDP, ETC)
  - European Fund for Strategic Investments (EFSI) and EIB
  - Horizon 2020 (e.g. transport pillar)
  - CEF/Transport
  - LIFE traditional projects and LIFE Integrated Projects
  - …
- Improving information, communication, awareness and exchange of best practice:
  - Database of air quality measures: http://fairmode.jrc.ec.europa.eu/measure-catalogue/
  - Air Quality index
  - Clean Air Fora and Expert Groups
  - Country Clean Air Dialogues
  - Urban Partnership on Air Quality (Pact of Amsterdam)
  - …

LIFE and Air Quality policies (1)

- Providing direct or indirect financial support for Air Quality priorities:
  - Energy, notably clean biomass (PM10, PM2.5)
  - Sustainable transport (PM10, PM2.5, NO2; Real World Emissions)
  - Agriculture (NH3, secondary PM)
  - Capacity building (incl. source apportionment, modelling)
  - Communication, awareness, information

LIFE and Air Quality policies (2)

- Important:
  - Appropriate indicators for LIFE traditional projects :

    a) quantification of benefits generally in kg or tons of air pollutant(s) or of reduced concentrations in exhaust gases, **not** concentrations in ambient air, **or**

    b) useful and relevant capacity building innovations (e.g. monitoring, applied high resolution modelling) to help implementation and evaluation of Air Quality measures
  - CO2 is not an air pollutant in the Ambient Air Quality Directive or the NEC Directive, PM and NO2 are.
  - Cost-benefit analysis
  - Links with Air Quality Plans under Directive 2008/50/EC and with National Air Pollution Reduction Programs (new NEC Directive)
  - Links with spending under the Structural Funds
  - Barriers and boundary conditions for implementation
  - After LIFE: long term effect and transferability/scaling-up potential, dissemination (database)
  - Tips and tricks …

Industrial Emissions

IED essential requirements (selected)

a) Achieve a high level of protection for the environment as a whole

b) Prevent pollution and, if not feasible, reduce

c) Access to information and public participation

d) Permit is required for operating the installation

e) Permit conditions to include:

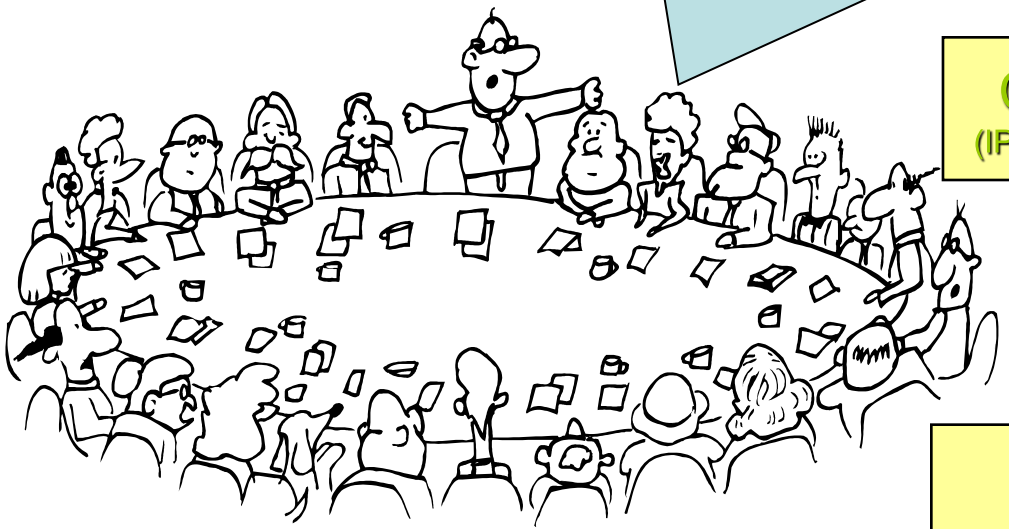
- emission limit values (ELVs) for all relevant pollutants - Annex II
- ELVs based on the use of the best available techniques (BAT)

BAT information exc

Installation level data (techniques, emissions, ...)

Member State experts

Commission (IPPC Bureau +DG ENV)

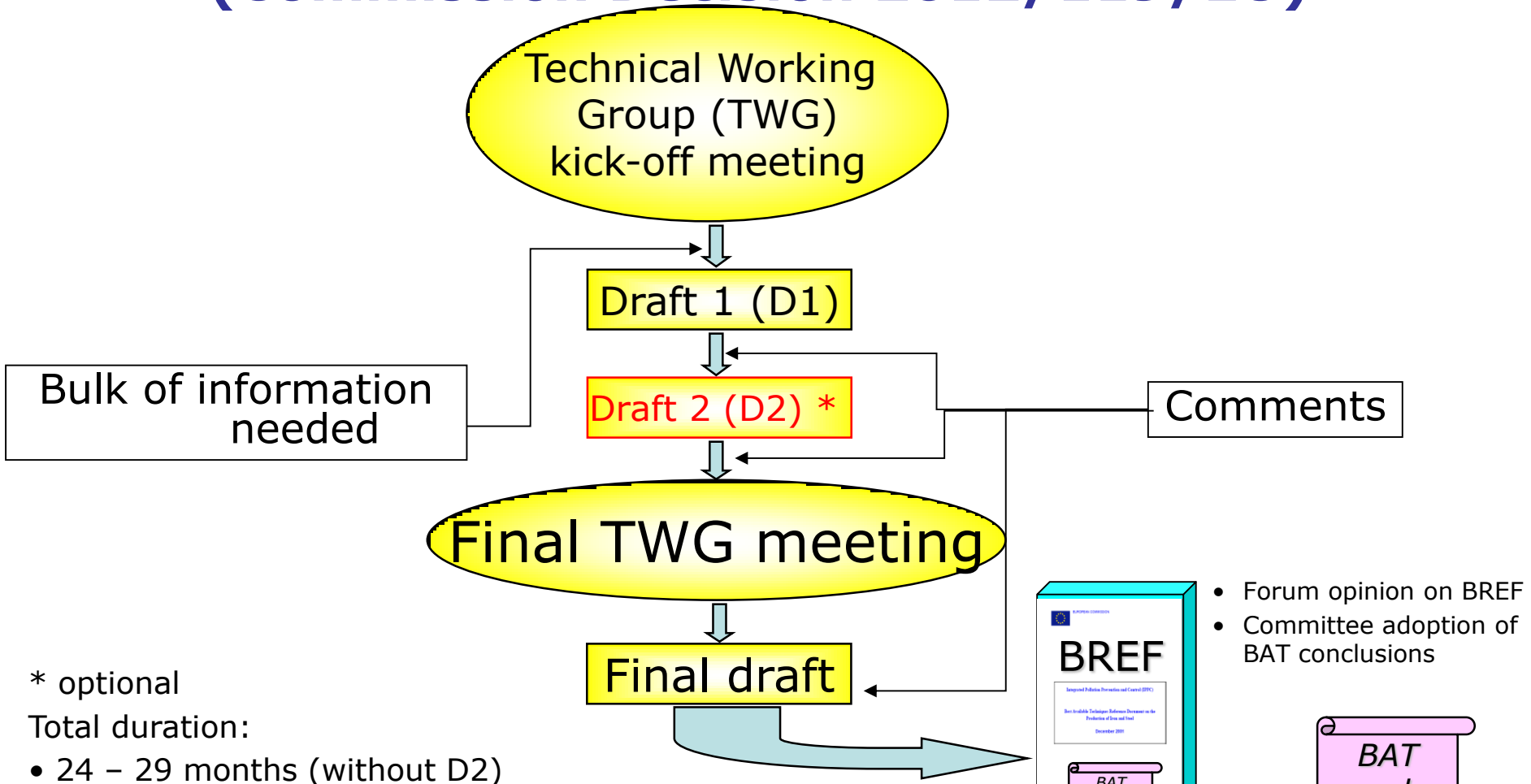


Industry experts

NGO experts

BREF (BAT reference document (with BAT conclusions)

The process (Commission Decision 2012/119/EU)



- Forum opinion on BREF
- Committee adoption of BAT conclusions

* optional

Total duration:

- 24 – 29 months (without D2)

Typical BREF content

Preface / Scope

1. General information on the sector
2. Applied processes & techniques
3. Current emission and consumption levels
4. Techniques to consider in the determination of BAT
5. BAT conclusions including:
   + BAT techniques – description, applicability
   + BAT emission levels (BAT AEL) & monitoring
   + BAT consumption levels & monitoring
6. Emerging techniques
7. Concluding remarks and recommendations for future work

Adoption via implementing act

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The 'BREF family'

1 Energy	2 Metals	3 Minerals	4 Chemicals	5 Waste	6 Other
• **Combustion (LCP)** • **Refineries (REF)**	• **Iron & Steel (IS)** • **Non ferrous (NFM)** • Ferrous processing (FMP) • Smitheries & foundries (SF) • Surface treatment of metals & plastics (STM)	• **Cement (CLM)** • **Glass (GLS)** • Ceramics (CER)	• Organics x 3 (**LVOC**, OFC, POL) • Inorganics x 4 (LVIC-AAF, LVIC-S, SIC, **CAK**) • **Waste water (CWW)** • Waste gases (WGC)	• Waste treatments (WT) • Waste incineration (WI)	• **Tanneries (TAN)** • **Pulp & paper (PP)** • **Intensive farming (IRPP)** • **Wood based panels (WBP)*** • Wood preservation (WPC)* • Textiles (TXT) • Slaughterhouses (SA) • Food & drink (FDM) • Surface treatment with organic solvents (STS)

Legend: **IED BAT conclusions** / IPPC BREFs (except *) – see IED § 13(7)/Ongoing

Common issues

BREFs: Industrial Cooling Systems (ICS), Energy Efficiency (ENE), Storage (EFS)

JRC Reference Reports: Monitoring (ROM), Economic & cross media effects (ECM)

BAT conclusions – update

Commission Implementing Decisions published in Official Journal:

1. **GLS**: manufacture of glass (***√ 2012/134/EU***)
2. **IS**: iron and steel production (***√ 2012/135/EU***)
3. **TAN**: tanning of hides and skins (***√ 2013/84/EU***)
4. **CLM**: production of cement, lime & magnesium oxide (***√ 2013/163/EU***)
5. **CAK**: production of chlor-alkali (***√ 2013/732/EU***)
6. **PP**: production of pulp, paper & board (***√ 2014/687/EU***)
7. **REF**: refining of mineral oil & gas (***√ 2014/738/EU*** plus ***2014/768/EU***)
8. **WBP:** wood based panels production (***√ 2015/2119/EU***)
9. **CWW**: common waste water treatment in chemical sector (***√ 2016/902/EU***)
10. **NFM:** non-ferrous metals industries (***√ 2016/1032/EU***)
11. **IRPP:** intensive rearing of of poultry and pigs (***√ 2017/302/EU***)
12. **LCP:** large combustion plants **(*√ 2017/1442/EU*)**
13. **LVOC :** large volume organic chemicals **(*√ not yet published*)**

√ positive opinion of the Article 13 'forum' -> Committee votes

13 BREFs adopted, 12 published

Ongoing BREF reviews: 5 (WT, WI, FDM, STS, FMP, WGC)

BREF reviews yet to commence: (about) 10

Desired outcomes from IED implementation

A. **Consistent application of BAT**

   i. **Reduced emissions –** both locally and nationally

   ii. **Level playing field for competition –** or, at least, less uneven

B. **Industry revitalised** - innovative ideas on reducing environmental impact and improving resource efficiency

C. **Emission prevention** - a move from the back-end abatement of emissions, to process-integrated controls at source

D. **Improved identification of BAT** - feedback loop of high quality information to subsequent BREF reviews / BAT evolution

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The main features of the MCP Directive (1)

Sets fuel-specific emission limit values (ELV) and contributes to national emission reduction needs for:

- SO2, NOx and PM
- New plants (from entry into force date + 2.5 years)
- Existing plants (from 2025 or 2030)

In Air Quality Zones (Dir. 2008/50/EC) or parts of zones, not complying with the air quality standards, the need for applying stricter ELV should be assessed (Article 9)

The main features of the MCP Directive (2)

Addresses main gap in policy framework (1-50 MWt)

- Above Ecodesign Directive
- Below Industrial Emissions Directive
- Increasingly important segment (in view of energy market trends)

Keeps administrative burden low (registration, not permitting)

Helps Member States to meet the new NEC requirements

Published on 28 November 2015; now Member States have to transpose the Medium Combustion Plants (MCP) Directive (2015/2193/EU)

More Information

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

http://eippcb.jrc.ec.europa.eu/reference/

Feedback

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Thank you!

European Commission

DG ENV C.3

Clean Air