Air Quality
Revision of EU Rules

CAMS General Assembly

Brussels, 12-13 June 2024

European Commission
Clean Air & Urban Policy Unit

EU clean air policy

SETTING OBJECTIVES FOR GOOD AIR QUALITY

Ambient Air Quality (AAQ) Directives

Maximum concentrations of
air polluting substances
($PM_{2.5}$, PM_{10}, NO_2, O_3, SO_2, CO, C_6H_6, BaP, As, Cd, Ni, Pb)

REDUCING EMISSIONS OF POLLUTANTS

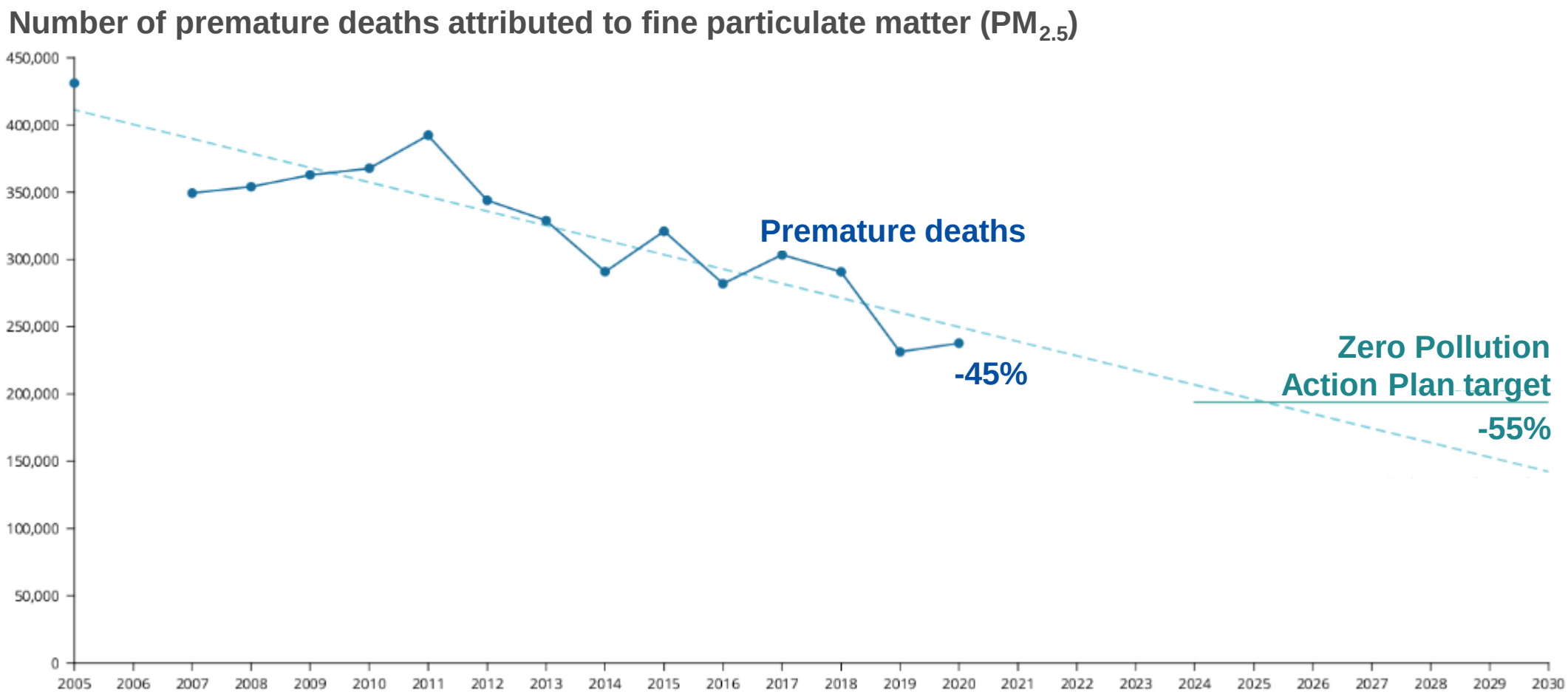
National Emission reduction Commitments Directive

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

Source-specific emission standards

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

Does EU clean air policy work? Yes … but …



https://www.eea.europa.eu/publications/air-quality-in-europe-2022/health-impacts-of-air-pollution

Why is air pollution (still) a problem in the EU?

- **Health impacts:** Air pollution is the number one environmental cause of health impacts in the EU, with significant morbidity effect and estimates of up to 300 000 premature deaths per year.
- **Social impacts:** It disproportionally affects vulnerable groups - children, elderly, persons with pre-existing conditions, socioeconomically disadvantaged.
- **Environmental impacts**: It causes eutrophication (74%) and acidification (5%) of ecosystem area exceeding critical loads, + crop and forest damage.
- **Economic impacts**: It causes annual costs at €231-853 billion (bn) in health impacts, €8 bn in lost workdays, €4-12 bn in ecosystems damage, €10-11 bn in crop yield loss, €19 bn in forest damage, €1 bn in damage to buildings.
- and **Europeans care about the air they breathe** (Eurobarometer 2022)

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Ambient Air Quality Directive (AAQD)

Update on the revision process

European Commission

“The Commission will draw on the lessons learnt from the evaluation of the current air quality legislation.

It will also propose to strengthen provisions on monitoring, modelling and air quality plans to help local authorities achieve cleaner air.

The Commission will notably propose to revise air quality standards to align them more closely with the World Health Organization recommendations.”

Communication on the European Green Deal
(COM/2019/640 final)

#EUGreenDeal

European Commission

Ambient air quality : revision of EU Rules

Adopted on 26 October 2022:

- Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on ambient air quality and cleaner air for Europe (recast) - **COM/2022/542 final**
- Commission Staff Working Document Impact Assessment Report - **SWD/2022/545 final** - and the corresponding Executive Summary - **SWD/2022/345 final**

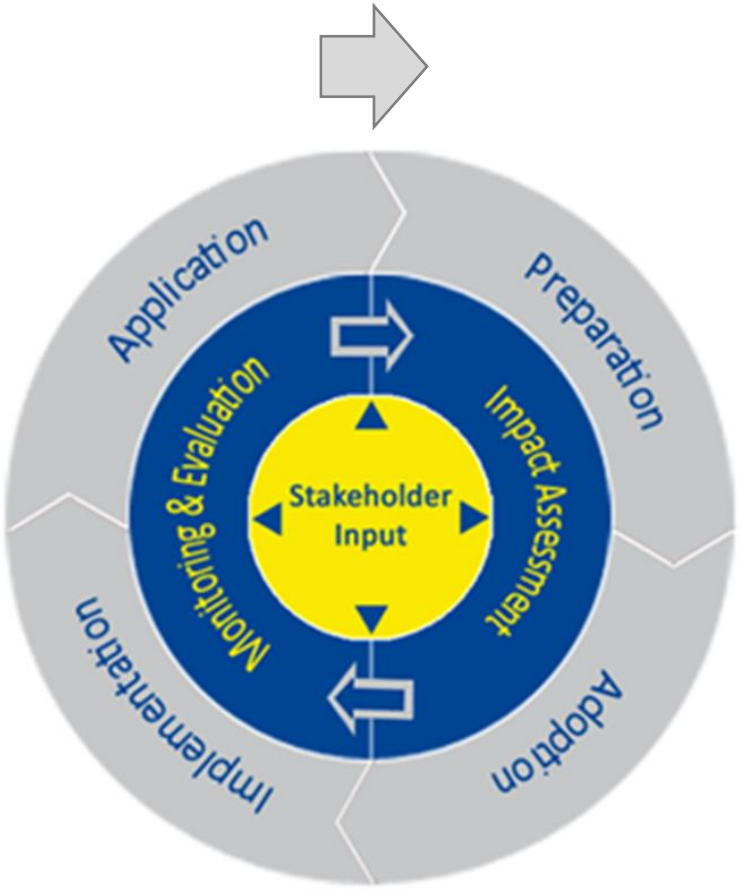
Supported by

- **Study to support the impact assessment** for a revision of the EU Ambient Air Quality Directives – Final Report & Appendix + Robustness checks and Sensitivity Analysis
- Study on systematic assessment of **monitoring of other air pollutants** not covered under Directives 2004/107/EC and 2008/50/EC

EU policy making cycle (key elements, stylised)

- Evaluation / fitness check
- Monitor, and report on implementation
- Regularly garner stakeholder input / reflections
- If needed: enforcement action by the Commission
- Implementation and compliance support

- Implementation by Member States
- Establish monitoring system
- **Implementation strategy by the Commission**
- **Transposition / conformity check by Com.**
- **Transposition by Member States**



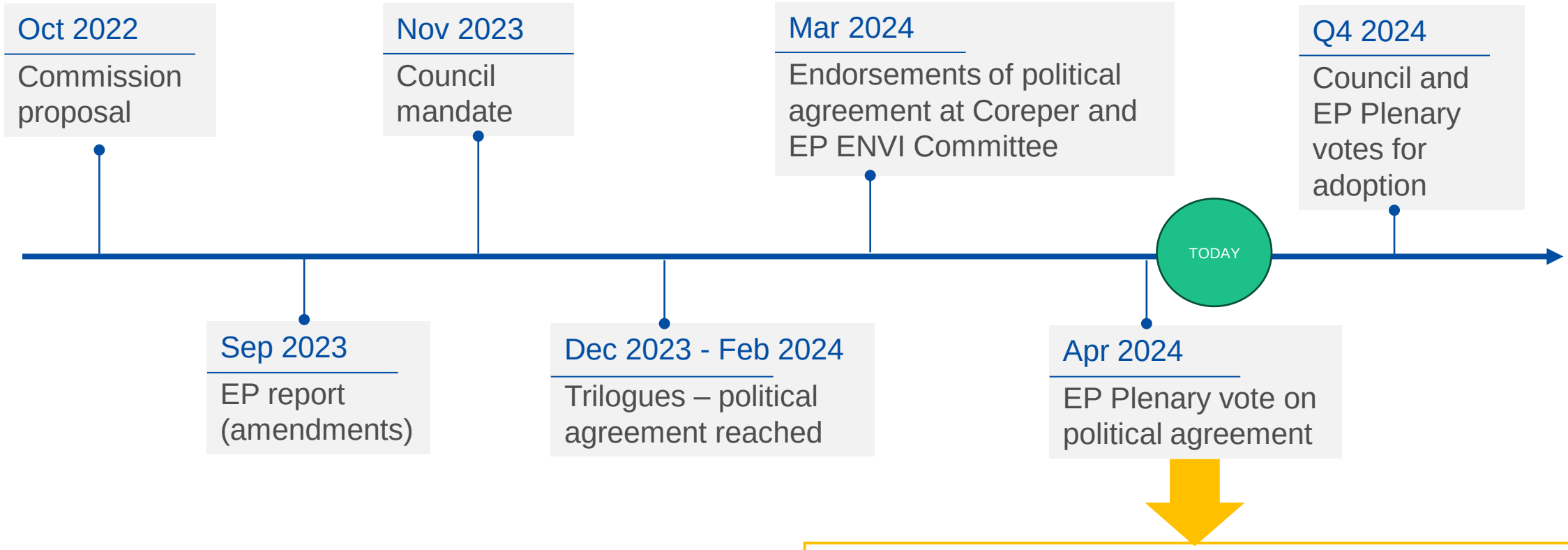
- Roadmap and inception impact assessment
- Stakeholder consultation
- Impact assessment
- Draft legislative proposal
- Adoption by College of Commissioners

- **Position by the European Parliament**
- **Position by the Council**
- **Negotiation between co-legislators**
- **Agreement on final legislative act and adoption**
- **Publication in the Official Journal**

Adoption foreseen for Q4 2024!

See: https://ec.europa.eu/info/sites/default/files/swd2021_305_en.pdf

Legislative procedure: state of play today



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What does ~~our proposal~~ *the agreement* improve?

Environment & health

- ✓ **Zero pollution objective** at the latest by 2050
- ✓ **Intermediate 2030 EU air quality standards**
- ✓ Update of **other air quality metrics**, including more refined average exposure obligations
- ✓ **Regular review mechanism**

Monitoring & assessment

- ✓ Refined approach to **air quality monitoring,** increased use of **air quality modelling**
- ✓ Additional information on representativeness of **sampling points**, better inform air quality action
- ✓ Monitoring **pollutants of emerging concern** (e.g. ultrafine particles, black carbon, ammonia)

Governance & enforcement

- ✓ Air quality plans to be more effective in **ending** and **preventing exceedances** of EU standards
- ✓ **Improved enforceability**: new provisions on access to justice, compensation and penalties
- ✓ More **transboundary cooperation** on air quality

Information & communication

- ✓ More **up-to-date air quality information**
- ✓ Requirements for **air quality indices** to provide hourly reporting of available air quality data
- ✓ **Informing the public** about possible health impacts and provide recommendations

Environment & health: ‘air quality standards’

EU air quality standards – ‘long-term’ averages (Annex I)

Pollutant	Period	Until 2030	As of 2030		WHO ‘Guideline’
$PM_{2.5}$	(calendar year)	25 µg/m³	**10 µg/m³**		5 µg/m³
PM_{10}	(calendar year)	40 µg/m³	**20 µg/m³**		15 µg/m³
NO_2	(calendar year)	40 µg/m³	**20 µg/m³**		10 µg/m³
SO_2	(calendar year)	-	**20 µg/m³**		-
Benzene	(calendar year)	5 µg/m³	**3.4 µg/m³**		1.7 µg/m³
Pb (lead)	(calendar year)	0.5 µg/m³	**0.5 µg/m³**		0.5 µg/m³
As (arsenic)	(calendar year)	6 ng/m³	**6.0 ng/m³**		6.6 ng/m³
Cd (cadmium)	(calendar year)	5 ng/m³	**5.0 ng/m³**		5 ng/m³
Ni (Nickel)	(calendar year)	20 ng/m³	**20 ng/m³**		25 ng/m³
Benzo(a)Pyrene	(calendar year)	1 ng/m³	**1.0 ng/m³**		0.12 ng/m³
Ozone	(5yr avg AOT 40)	18.000 µg/m³ x h	**18.000 µg/m³ x h**	(target value)	-
Ozone	(5yr avg AOT 40)	6.000 µg/m³ x h	**6.000 µg/m³ x h**	(long-term obj.)	-

Environment & health: ‘air quality standards’

EU air quality standards – ‘short-term’ averages (Annex I)

Pollutant	Period	Until 2030	As of 2030		WHO ‘Guideline’
$PM_{2.5}$	(1 day)	-	**25 µg/m³** (-18d)		15 µg/m³ (-3d)
PM_{10}	(1 day)	50 µg/m³ (-35d)	**45 µg/m³** (-18d)		45 µg/m³ (-3d)
NO_2	(1 day)	-	**50 µg/m³** (-18d)		50 µg/m³ (-3d)
NO_2	(1 hour)	200 µg/m³ (-18h)	**200 µg/m³** (-3h)		200 µg/m³ (-1h)
SO_2	(1 day)	125 µg/m³ (-3d)	**50 µg/m³** (-18d)		40 µg/m³ (-3d)
SO_2	(1 hour)	350 µg/m³ (-24h)	**350 µg/m³** (-3h)		-
CO	(1 day)	-	**4 mg/m³** (-18d)		4 mg/m³ (-3d)
CO	(8 hour max)	10 mg/m³	**10 mg/m³**		10 mg/m³
Ozone	(3yr avg 8h max)	120 µg/m³ (-25d)	**120 µg/m³** (-18d)	(target value)	100 µg/m³ (-3d)
Ozone	(3yr avg 8h max)	120 µg/m³ (-3d)	**100 µg/m³** (-3d)	(long-term obj.)	100 µg/m³ (-3d)

Environment & health: 'other metrics'

Average exposure reduction obligations

Pollutant	Period	As of 2030
$PM_{2.5}$	(10 year)	**-10 to -25%** per 10 year
Applies if average exposure concentration is > **5 µg/m³**		
NO_2	(10 year)	**-15 to -25%** per 10 year
Applies if average exposure concentration is > **10 µg/m³**		

*To be based on **Average Exposure Indicator,** expressed as µg/m³ (AEI) shall be based upon measurements in **urban background** locations in average exposure territorial units (AETU);*

*The AEI shall be assessed as a **3-calendar-year** running annual mean averaged over all urban background sampling points in the AETU.*

AETU = NUTS1 or NUTS2 or combination thereof if smaller than entire territory of the Member State and < 85 000 km²

Alert thresholds

Pollutant	Current	Agreement
$PM_{2.5}$	-	**50 µg/m³**
PM_{10}	-	**90 µg/m³**
SO_2	500 µg/m³	**350 µg/m³**
NO_2	400 µg/m³	**200 µg/m³**
Ozone	180 µg/m³	**240 µg/m³**

Measured as an hourly average over 3 consecutive hours for SO_2 and NO_2; as a daily average over 3 consecutive days or less for $PM_{2.5}$ and PM_{10}

Information thresholds

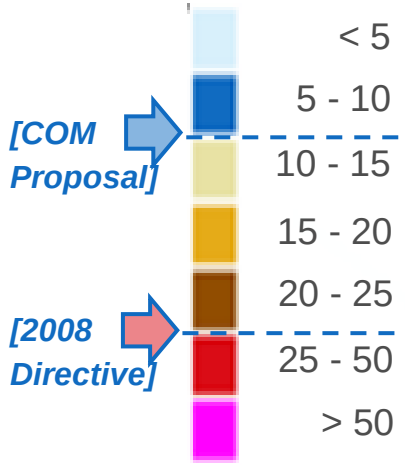
Pollutant	Current	Agreement
$PM_{2.5}$	-	**50 µg/m³**
PM_{10}	-	**90 µg/m³**
SO_2	-	**275 µg/m³**
NO_2	-	**150 µg/m³**
Ozone	240 µg/m³	**240 µg/m³**

Measured over 1 hour for SO_2, NO_2, 1 day for ozone, $PM_{2.5}$ and PM_{10}

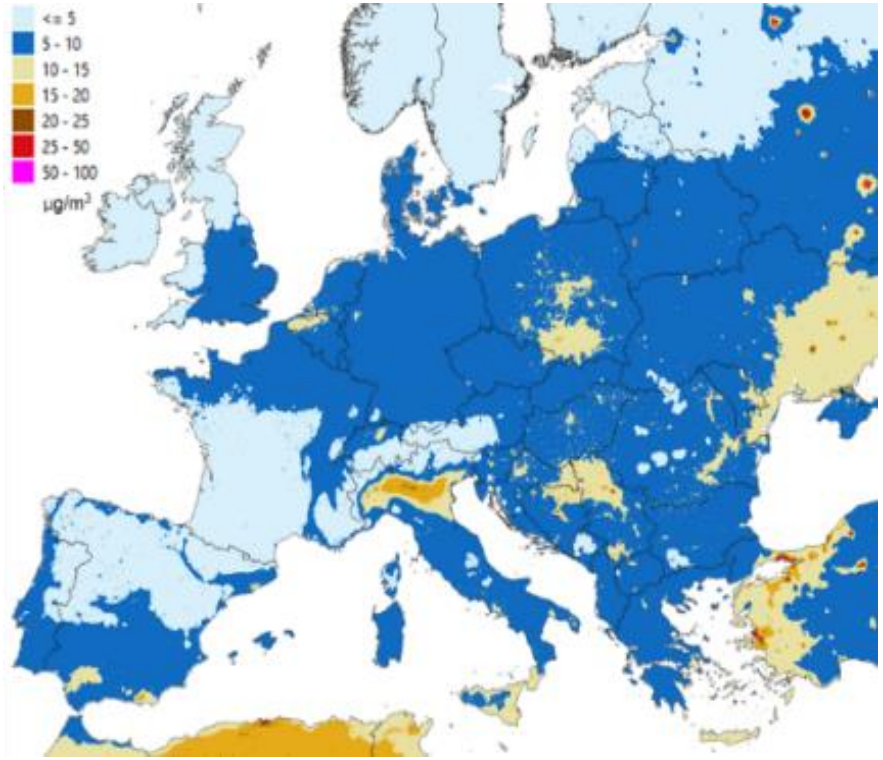
What will the new Directive achieve?

First and foremost, the air quality will improve across the European Union.

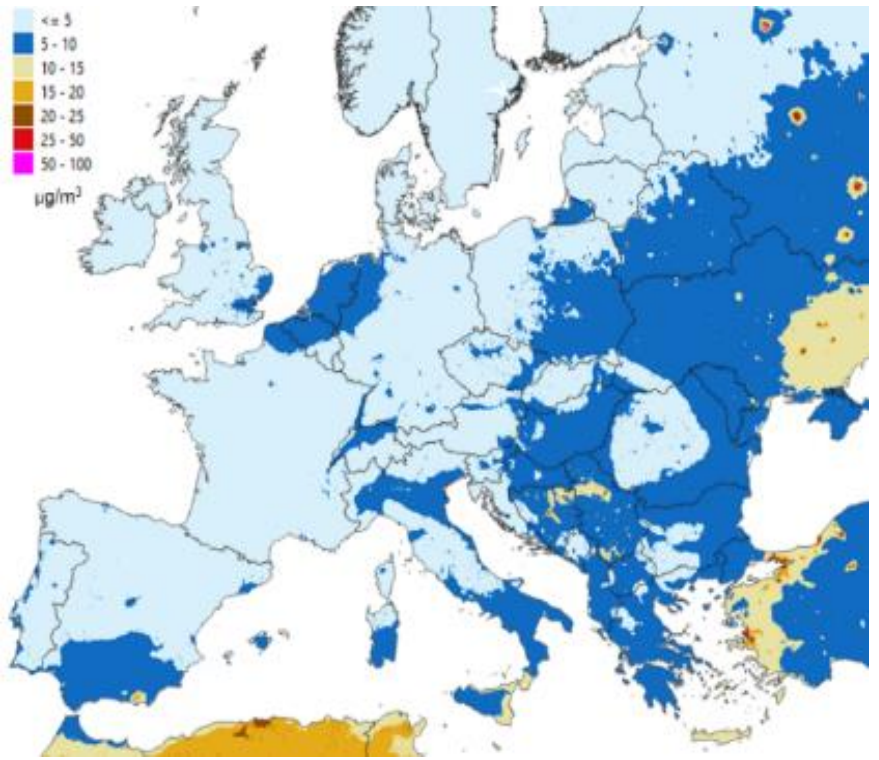
$PM_{2.5}$ concentration levels (µg/m³, annual)



$PM_{2.5}$ levels in 2020



$PM_{2.5}$ levels in 2030 with COM proposal



Based on GAINS/EMEP/uEMEP. Note that these maps show the total concentration levels, and include also contributions from natural sources of wind blown dust and sea salt.

What will the new Directive achieve?

- **Health benefits:** Reduces annual mortality (premature deaths) linked to air pollution by more than 75% (and by 50% more than without this policy)[(1)]
  – also reduces related morbidity (illnesses) by 50% more than without this policy.

- **Social benefits:** Stricter limit values particularly protect sensitive populations and vulnerable groups; Directive requires additional health impact information.

- **Environmental benefits**: Decreases in eutrophication (-22%) and acidification (-63%) of ecosystems; less crop losses and damage to forests.

- **Economic benefits:** Benefits far outweigh the costs, with annual total gross benefits estimated at €42 bn (and up to €121 bn depending on the valuation method) in 2030, compared to measures that costs less than €6 bn annually.

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[(1)] Note that these estimates refer only to health impacts above the WHO Air Quality Guideline levels. However, air pollution below these levels can also impact human health.

The recognition of the role of CAMS in the political agreement

(10) ***Where applicable,*** modelling applications should be applied to enable point data to be interpreted in terms of geographical distribution of concentration ***of pollutants, which may*** help to detect breaches of air quality standards, and to inform air quality plans and ***air quality roadmaps and*** the placement of sampling points. In addition to the requirements for air quality monitoring defined in this Directive, for monitoring purposes, Member States are encouraged to exploit information products and supplementary tools (e.g. regular evaluation and quality assessment reports, policy online applications), provided by the Earth Observation component of the EU Space Programme, in particular the Copernicus Atmosphere Monitoring Service (CAMS).

CAMS support: implementation of the AAQD

- Use of CAMS information to quantify **contributions of natural sources** to air pollution. Several Member States already use CAMS products for identifying contributions of natural sources to air pollutant concentrations as regards exceedances in the context of the AAQD
- Use of CAMS information to quantify **contributions to background air pollution**. This will require a collaborative effort with FAIRMODE, and with the relevant research networks (including EMEP and ACTRIS) to strengthen the validation procedures.
- Use of CAMS information to identify **transboundary contributions to air pollution**.
- Use of CAMS forecasting information, including as input to the **EEA Air Quality Index.**
- Use of CAMS **downscaling activities:** for example, as regards health risk assessments and in the Copernicus Health Hub or as input to EEA/JRC environmental health services.
- Use of CAMS information to **support air quality plans**, including source allocation services and scenario development.

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The (enhanced) role of modelling in the AAQD

Optional / mandatory use of modelling

- Identifying assessment regimes (Art. 7)
- Air quality assessment (Art. 8)[a] and modelling for air quality plans and roadmaps (Art. 19)
- Monitoring network design (Art. 9, Annex IV D) and spatial representativeness (Annex IV B)[a]
- Projections for alert and information thresholds (Art. 15) and modelling for Short-term action plans (Art. 20)
- Modelling for the postponement of attainment deadlines (Art. 18)[a]
- Modelling the contribution of natural sources (Art. 16)[a] and winter-sanding and –salting (Art. 17)[a]
- Public Information / AQI (Art. 22)

[a]: Commission is tasked to draw up Implementing acts

The (enhanced) role of modelling in the AAQD

Definition of data quality objectives

- Uncertainty for modelling is defined as ***"Maximum ratio of uncertainty of modelling applications over uncertainty of fixed measurements"***
- The modelling quality objective (MQI ≤ 1) shall be verified at least at 90 % of the available monitoring points, over the assessment area and period considered.
- References to descriptions of the modelling application and information on the calculation of the modelling quality objective shall be compiled

Member States to designate a national reference institution for modelling

Establishment of a European network of air quality modelling for these national reference points (≠ FAIRMODE)

Implementing acts in the political agreement

The Commission will be tasked with providing further technical details on:

- **Modelling applications** (including how results from modelling applications and indicative measurements shall be taken into account when assessing air quality and how potential exceedances that are identified by those assessment methods can be verified) + determining the **spatial representativeness** of sampling points;
- Demonstration and subtraction of exceedances attributable to **natural sources** (including information to be provided by MS);
- Methodology for determining contributions from the re-suspension of particulates following **winter-sanding or winter-salting** of roads (including information to be provided by MS);
- Requirements for **projections** performed for the purposes of postponement of attainment deadlines + information to be included in **implementation reports**;
- **Reporting** of air quality information to the Commission.

Technical guidance documents

- Preparation of **two technical guidance documents**

  (i) Monitoring: on the use of reference methods and demonstration of equivalence, and the assurance of relevant data quality objectives, including for established and additional air pollutants

  (ii) **Modelling**: on the use of modelling for various application domains under the Ambient Air Quality Directive

- Same **timelines**:
  - Draft versions with **AQUILA + FAIRMODE** through summer 2024
  - Final draft versions with AAQEG in Oct 2024
  - Final versions in early 2025

National Emission reduction Commitments (NEC) Directive

Update on the evaluation

European Commission

NECD – State of implementation

- Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants (NECD)
- Defines specific **national emission reduction commitments** for each MS for **SO_2, NO_x, NMVOC, NH_3 and $PM_{2.5}$** for 2020-2029 and for 2030 onwards
- MS need to report yearly **emission inventories** and to develop and update regularly **National Air Pollution Control Programmes** (NAPCP)
- Implementation on-going, but shortcomings – especially as regards emission inventories and reduction commitments – still in several Member States

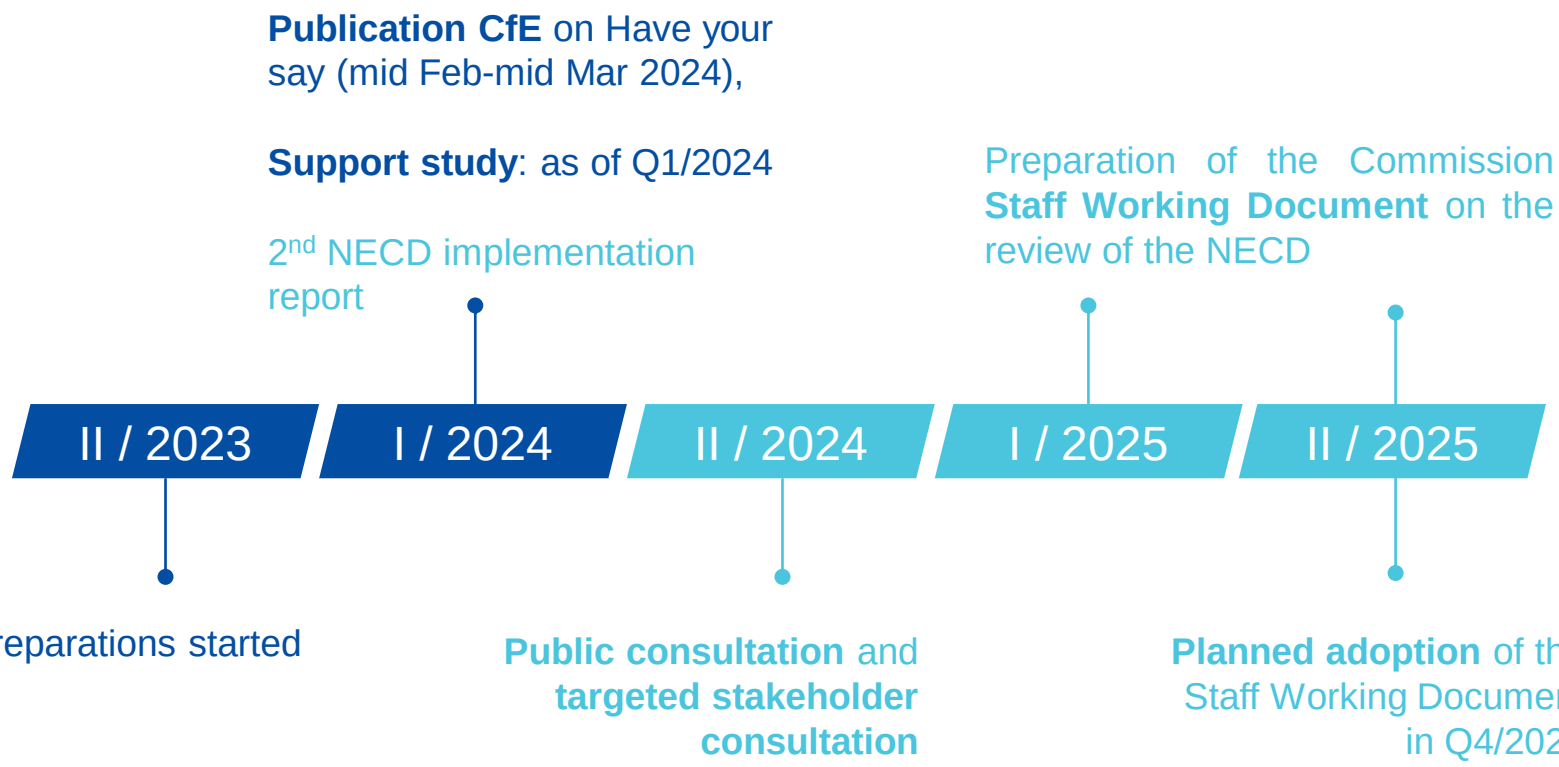
Evaluation of the NEC Directive

- By end 2025, in line with Article 13 of the Directive:

  *"[…] the Commission shall **review** this Directive **no later than 31 December 2025** with a view to **safeguarding progress towards achieving the objectives referred to in Article 1(2),** in particular by taking into account scientific and technical progress and the implementation of Union **climate and energy policies**."*

- Public consultations:
  - Call for Evidence is published and was open for public feedback
  - Further online consultations and stakeholder event around autumn 2024
- Website informing about evaluation

Indicative timeline NECD review



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CAMS support: implementation of the NECD

- Use of Copernicus C3S temperature data to account for exceptional meteorological conditions within one specific year in the flexibility mechanisms under the NECD reporting.
- Possible use of CAMS emissions and concentrations for national inventory and other reporting under the NECD.
- Possibilities for gap filling and QA/QC support on reported LCP industrial data, update of E-PRTR diffuse emissions and forecast of emissions.
- Possible use of inverse modelling to flag possible inconsistencies and gaps in the reported data.

Key to success: synergies and cooperation

- There are several active networks dealing with the zero pollution action plan and related EU Clean Air policies, which support policy implementation – each with different roles and focus:
  - AQUILA
  - FAIRMODE
  - EEA and EIONET
  - Air Convention and EMEP
  - … and national- and local-level competent authorities.

>> CAMS has much to offer to feed *(or rather: continue to feed)* into these processes.

Contact us:

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Thank you