

Reducing air pollution

National emission ceilings for air pollutants

SUMMARY

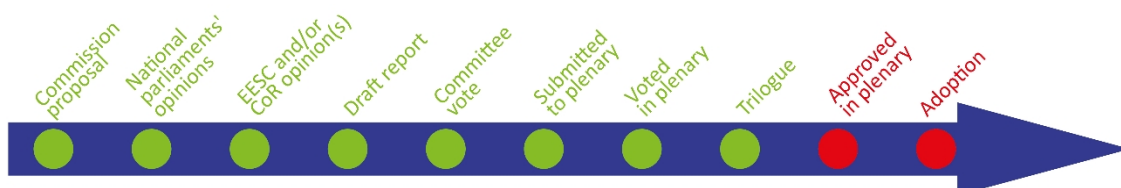
Despite significant progress in recent decades, air pollution levels in the European Union still have adverse impacts on the environment and on health. The European Commission estimates that health-related costs of air pollution in the EU range from 390 to 940 billion euros per year.

The proposed directive, which would replace the current National Emission Ceilings Directive, sets binding national reduction objectives for six air pollutants (SO₂, NO_x, NMVOCs, NH₃, PM_{2.5} and CH₄) to be met by 2020 and 2030. It will also implement the Gothenburg Protocol as amended in 2012. The European Commission estimates that implementation costs would range from 2.2 to 3.3 billion euros per year.

On 30 June 2016, Commission, Council and Parliament reached an agreement in interinstitutional trilogue negotiations. The agreement, endorsed by the Committee for Environment, Public Health and Food Safety (ENVI) on 12 July 2016, is expected to be submitted for a first-reading vote in the November I plenary.

Proposal for a Directive of the European Parliament and of the Council on the reduction of national emissions of certain atmospheric pollutants and amending Directive 2003/35/EC

| | | |
|-------------------------------|---|--|
| <i>Committee responsible:</i> | Environment, Public Health and Food Safety (ENVI) | COM(2013)920 of 18.12.2013 |
| <i>Rapporteur:</i> | Julie Girling (ECR, UK) | <i>procedure ref.:</i> 2013/0443(COD) |
| <i>Next steps expected:</i> | Adoption in plenary | Ordinary legislative procedure |



This briefing updates an earlier edition, of 23 November 2015: [PE 572.780](#).

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Introduction

In December 2013, the Commission presented the 'Clean air policy package' containing, besides the proposal on the reduction of national emissions, a 'Clean air programme for Europe' [communication](#), a proposed [directive for medium-sized combustion plants](#) and a [proposal for ratification of the amended Gothenburg Protocol](#).

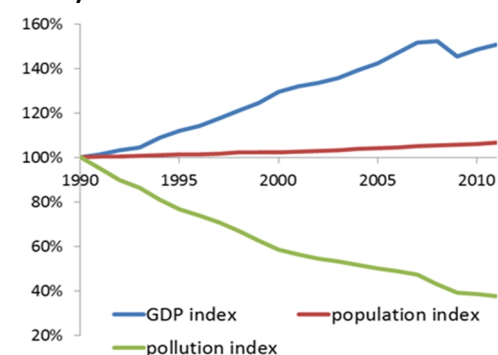
According to the Commission communication, the proposal would deliver progress towards the strategic long-term objective of 'achieving levels of air quality that do not give rise to significant negative impacts on and risks to human health and the environment.' In practical terms, the long-term objective translates as meeting World Health Organisation (WHO) air quality guidelines as well as critical pollutant levels for ecosystems. The proposal also aims to transpose into EU law international obligations agreed under the amended [Gothenburg Protocol](#), to be met by 2020.

The proposal was initially not included in the Commission's [2015 work programme](#). However, it was not withdrawn and Commissioner Karmenu Vella indicated that the Commission would put forward modifications in the course of ongoing negotiations.

Context

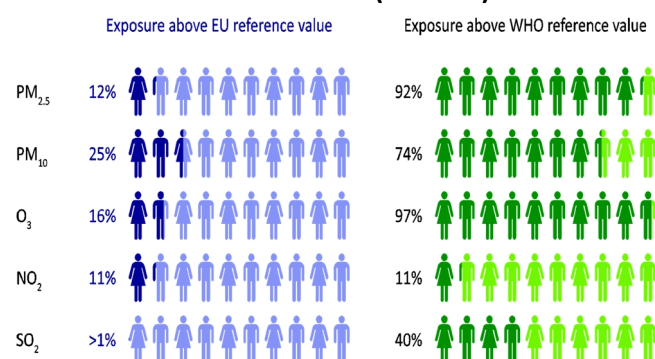
Air quality has improved considerably in recent decades, while GDP and population have grown, as shown in figure 1. However, despite considerable improvements, the European Environment Agency (EEA) indicates that the EU is still far from achieving levels that do not result in unacceptable risks to humans and the environment.

Figure 1 – GDP, population and pollution index in the EU, 1990 = 100% (1990-2012)



Data source: [European Commission](#), 2014.

Figure 2 – Percentage of the urban population in the EU28 exposed to air pollutant concentrations above EU and WHO reference levels (2010-12)



Source: [European Environment Agency](#), 2014.

Many Europeans are affected, especially in urban areas (see figure 2). Ecosystems and biodiversity are also widely affected, with 62% of the area of EU ecosystems considered as exceeding eutrophication limits in 2010. Moreover, several air pollutants contribute to global warming, while some reduce it by blocking solar radiation.

WHO air quality guidelines

The air quality guidelines defined by the World Health Organisation are intended as policy guidance. They are based solely on health considerations and are regularly updated with the latest scientific knowledge. WHO guidelines do not consider the technical feasibility or the economic, political and social aspects of achieving these levels. Moreover, health risks may still exist at or below concentrations set in the air quality guidelines.

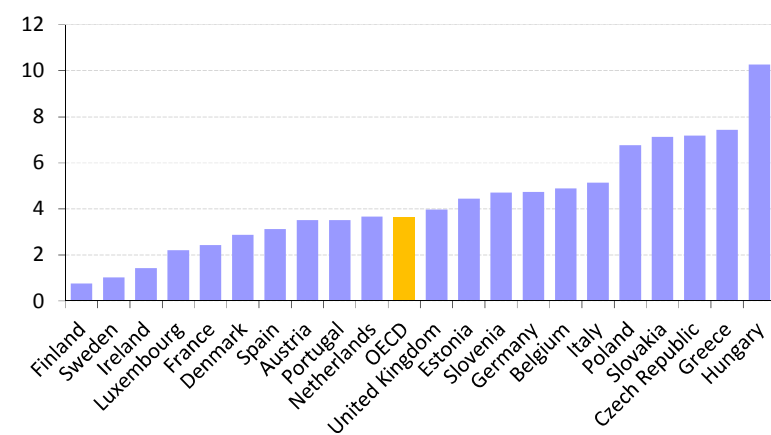
[Air pollutants](#) can be emitted directly in the atmosphere (i.e. 'primary pollutants') or formed in the atmosphere on the basis of 'precursor' substances (i.e. 'secondary pollutants'). As a result, emission reductions do not necessarily produce a corresponding drop in atmospheric concentrations, especially for secondary pollutants such as O₃ and particulate matter (PM).¹

Various **sectors of the economy** contribute to the emission of air pollutants. Data from the national emission inventories compiled by the EEA show the following picture: PM is emitted mainly by heating, industry and transport; NO_x mainly by the transport sector; the bulk of SO_x emissions come from energy production and non-road transport; almost all NH₃ emissions come from agriculture; NMVOCs come mainly from 'solvent and product use' (paints and chemicals used in manufacture and maintenance); CO emissions come from heating and transport; and most CH₄ emissions come from the agriculture, waste and energy sectors.

Air pollution has considerable **adverse impacts on health**. The European Environment Agency estimates that in 2011, PM_{2.5} and ozone concentrations were responsible respectively for 430 000 and 16 000 premature deaths in the EU28. Findings compiled by the WHO show that air pollution increases the risk of a wide range of diseases (respiratory, cardiovascular and cancer),² with short-term (acute) as well as long-term (chronic) effects. Recent studies suggest exposure during pregnancy and in early life can significantly affect foetus and child development and trigger diseases later in life. Health impacts are mainly associated with PM, O₃, SO₂, as well as heavy metals (arsenic, cadmium, lead, mercury, nickel).

The total **health-related costs of air pollution** in the EU are in the range of €330–940 billion per year (including €15 billion from lost workdays, €4 billion from healthcare costs, €3 billion from crop yield loss and €1 billion from damage to buildings), according to the [impact assessment](#) drawn up by the Commission. The OECD [estimated](#) in 2014 that the health impact of air pollution costs OECD countries about €1 500 billion per year, and, in 2015, published estimated costs of air pollution compared to gross domestic product (GDP), which show wide differences between Member States.³ The OECD [points out](#) that although damage to health affects GDP through higher absenteeism and lower productivity, a large part of these effects fall on the non-working population, and health effects may increase demand, for example, for health services.

Figure 3 – Estimated cost of air pollution as % of GDP (2010)



Data source: [OECD](#), 2015.

Air pollution's main **effects on the environment** are:

- eutrophication, an excess of nutrients in soil or water which often causes 'algal blooms' in water bodies, and may ultimately lead to a depletion of the oxygen supply with impacts on ecosystems and biodiversity;
- acidification, a change in the soil's pH level, caused mainly by sulphur and nitrogen compounds, damaging plant and animal life on land and in water; and
- damage to vegetation from ground-level ozone, which harms plant cells and impairs their ability to grow, leading in turn to reduced agricultural crop yields, decreased forest growth and reduced biodiversity.

Existing situation

EU **air quality policy** rests on the 2013 [Clean Air Programme for Europe](#),⁴ a range of acts related to sources of pollution,⁵ and three major legal acts. The [Ambient Air Quality Directive](#) defines binding limit values for the atmospheric concentration of the main air pollutants (PM, O₃, NO₂, SO₂, CO, benzene and lead) and requires Member States to define zones to assess and manage ambient air quality, to monitor long-term trends and to make the information available to the public. The [Directive on arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air](#) sets non-binding targets for the atmospheric concentration of these substances. The [National Emission Ceilings Directive](#), which is to be replaced by the proposed directive, sets maximum amounts of four pollutants responsible for acidification, eutrophication and ground-level ozone (NO_x, SO₂, NH₃, NMVOCs) that each Member State is entitled to emit per year as of 2010.

The EU and Member States are also bound by **international agreements** regarding air pollution. The Geneva Convention on Long-range Transboundary Air Pollution ([CLRTAP](#)), which came into force in 1983, aims to protect humans and the environment from air pollution. It has been complemented by eight protocols, including the [Gothenburg Protocol](#) on acidification, eutrophication and ground-level ozone which is implemented in EU law by the National Emission Ceilings Directive. The Protocol, as amended in 2012, sets targets for 2020. Annex 6 of the International Convention for the Prevention of Pollution from Ships ([MARPOL](#)) sets limits on SO_x and NO_x emissions from ship exhausts. It came into force in 2005.

In respect of the **implementation of the National Emission Ceilings Directive**, the Commission launched infringement proceedings against four Member States that had failed to transpose the Directive in 2004. A majority of Member States have reached the emission ceilings to be met by 2010. However, nine Member States had not reached their ceilings in 2011, in particular those for NO_x.⁶

The changes the proposal would bring

The [proposed directive](#), which would repeal the current National Emission Ceilings Directive while continuing to be based on the principle of national emission ceilings,⁷ sets binding reduction objectives for 2020 and 2030 and indicative reduction objectives for 2025. The proposal would transpose international obligations, agreed under the amended [Gothenburg Protocol](#), to be met by 2020. The objective is to achieve 70% of the 'maximum technically feasible reduction' by 2030, compared with a 2005 baseline.⁸ In addition, the proposal amends the [Directive on public participation in the preparation of programmes related to the environment](#) to ensure it covers national air pollution control programmes.

In addition to the pollutants covered by the National Emission Ceilings Directive (SO₂, NO_x, NMVOCs, NH₃), the proposal introduces ceilings for two new pollutants: PM_{2.5} (in particular black carbon, the sooty part of particulates emitted from combustion) and CH₄. It also introduces the possibility for Member States to use flexibility mechanisms, for instance as regards accounting for some emission reductions achieved by the shipping sector, and joint implementation of CH₄ commitments.

The Commission estimates that benefits would largely outweigh costs: while the benefits (decrease in external costs of air pollution) are expected to reach at least €40 billion per year,⁹ meeting the targets would cost between €3.3 billion ([initial estimates](#) from December 2013) or €2.2 billion ([updated estimates](#) from January 2015) per year. The Commission also suggests that about 40 000 new jobs would be created as a result of the entire clean air policy. According to the Commission, the proposal would benefit all EU citizens (especially children and the elderly), and also industry, thanks to a boost to innovation and competitiveness in the field of green technology.

In its impact assessment, the Commission indicates that potential adverse impacts on competitiveness would focus on sectors exposed to international competition. The most significantly affected sectors would be petroleum refining and agriculture, although other sectors, such as chemicals and iron and steel, would be affected as well.¹⁰

As sources of air pollutants and greenhouse gases are often the same, air pollution policy is interlinked with climate change policy. Meeting reduction targets is expected to trigger benefits for climate change. Conversely, climate change policy can also help reduce air pollution (see 'Parliamentary analysis', below). The interaction between the two policies are summarised by the [US Environmental Protection Agency](#).

Preparation of the proposal

The European Environment Agency published a [report](#) in 2012 on the achievement of health and environmental objectives under the National Emission Ceilings Directive.

In December 2013, the Commission presented an impact assessment of the proposals in the 'Clean air package' (See 'Parliamentary Analysis', below, for details of analysis of this by EPRS's Ex-Ante Impact Assessment Unit). The [impact assessment \(executive summary\)](#) considered five policy options for which health, environmental, economic and social impacts were assessed. The Commission also published a [study](#) analysing in detail the main reasons for non-compliance with the 2010 national emission ceilings.

The [International Institute for Applied Systems Analysis](#) (IIASA) has published a [series of reports](#) since 2012 supporting the European Commission in the review of EU air pollution policy. Six of these were published after the Commission tabled its proposal. At the request of the Council Presidency, the IIASA carried out [bilateral consultations](#) with Member State experts in the course of 2014 with a view to clarifying the cost-effectiveness analysis related to the ceilings. In September 2014, the IIASA proposed a [system of trade-offs between pollutants](#) at Member State level aimed at reducing the cost of compliance. In January 2015, the IIASA published [updated data](#) suggesting a larger

Figure 4 – Proposed reduction targets in EU28, compared to 2005

| | 2020 | 2030 |
|-------------------|------|------|
| SO ₂ | -59% | -81% |
| NO _x | -42% | -69% |
| NM VOC | -28% | -50% |
| NH ₃ | -6% | -27% |
| PM _{2.5} | -22% | -51% |
| CH ₄ | / | -33% |

Data source: [Commission proposal](#), 2013

decrease in PM emissions than foreseen in the baseline case, which would reduce the emission reduction requirements as well as the costs.

Parliament's starting position

In its resolution of 26 September 2006 on the [thematic strategy on air pollution](#), Parliament called for more ambitious emission reduction targets for VOC, PM_{2.5} and NO_x, on the basis that it would lead to greater health and employment benefits, while maintaining a balanced approach between costs and benefits. Parliament also called for the introduction of target and limit values for particulate matter concentration.

During the adoption of the [Ambient Air Quality Directive](#) in 2007, Parliament called for EU measures to reduce emissions at source, and successfully pushed for an indicative limit value for PM_{2.5} to be achieved by 2020.

Stakeholders' views

[Stakeholders' reactions](#) have been mixed. A number of stakeholders highlighted that some sectors have already managed to reduce their emissions significantly, and called for technical and economic feasibility to be taken into account when defining emission ceilings. Stakeholders from sectors likely to be most affected by the proposal put forward concrete suggestions. Other stakeholders call for more ambitious goals.

Advisory committees

In its [opinion](#) of 10 July 2014 on the 'Clean air package', the **European Economic and Social Committee** regrets that the 2025 objectives are not binding and calls for a series of 'firm actions', among others: emission reduction requirements for methane in 2020 and for mercury in 2020, 2025 and 2030; specific measures to reduce ammonia and methane in the agricultural sector; the introduction of 'real-world' measurements for vehicle emissions; the implementation of the International Maritime Organisation's NO_x and SO₂ standards for ships by 2016, as agreed in 2008; and medium to long-term predictability in policies.

In its [opinion](#) of 7 October 2014 on the 'Clean air package', the **Committee of the Regions** calls for the proposed 2030 emission reduction commitments at least to remain unchanged and to be strengthened further where possible. It advocates binding 2025 interim targets and warns that the proposed flexibility mechanisms must not be used as an excuse for not intervening if the policy does not deliver the expected results.

National parliaments

Parliaments in 15 Member States have [examined](#) the proposal. No Reasoned Opinions have been received. In three Member States however, national parliaments expressed some concerns: the [Czech Senate](#) and Chamber of Deputies call for due attention to be paid to the competitiveness of companies; the [Polish Senate](#) warns that 2030 reduction commitments are too high and would entail disproportionately large costs, in particular for the agricultural sector; the [Romanian Chamber of Deputies](#) expresses concerns regarding the implementation of measures suggested to reduce emissions in small farms, and advocates the possibility of derogations in specific cases.

Parliamentary analysis

In April 2014, the Ex-Ante Impact Assessment Unit of EPRS produced an [initial appraisal](#) of the impact assessment carried out by the Commission. It concludes that the Commission impact assessment is a thorough and methodical analysis, but it remains

cautious nevertheless with regard to the completeness of the assessments, the scope for further work (especially as regards agriculture, shipping and SO₂ emissions) and the certainty of the conclusions drawn.

Upon request of the Environment, Public Health and Food Safety Committee, the Ex-Ante Impact Assessment Unit undertook a [complementary impact assessment](#) on interactions between EU air quality policy and the 2030 climate and energy policy presented in January 2014. The study concludes that, as a result of synergies between both policies, the costs of meeting the proposed targets would be reduced from €3.3 to 1.4 billion per year, or that more ambitious targets could be reached for the initially expected cost.

In October 2014, the EP's Policy Department A published a [study](#) analysing WHO air quality guideline values for health in the context of the legislative proposal on the reduction of national emissions.

Legislative process

The Environment, Public Health and Food Safety (ENVI) Committee requested a complementary impact assessment, which was presented to the Committee on 6 November 2014. The EP held a [public hearing](#) on 'EU air quality policy: reducing national emissions beyond 2020' on 4 December 2014. The ENVI Committee adopted its [report](#) on 15 July 2015.

In its first reading [position](#) adopted on 28 October 2015 before referring the matter back to the ENVI Committee, the EP plenary voted among other things to exclude methane emissions from ruminant livestock from the proposal's scope and to endorse the targets proposed by the Commission (aiming to reduce the number of premature deaths by 52% by 2030 compared to 2005 levels). In its [general approach](#) agreed in December 2015, the Council expressed its will to exclude methane from the scope and to lower the ambitious level of the proposed targets (based on a 48% reduction of premature deaths by 2030).

On 30 June 2016, Commission, Council and Parliament reached a [compromise agreement](#) in interinstitutional trilogue negotiations. Its main elements include:

- excluding methane from the scope of the proposal;
- setting targets aimed at reducing premature deaths from air pollution by 49.6% by 2030 compared to 2005 levels; which implies for individual pollutants: reducing SO₂ emissions by 79%, NO_x emissions by 63%, NMVOC emissions by 40%, NH₃ emissions by 19%, and PM_{2.5} emissions by 49%;
- not setting binding interim targets for 2025: Member States should determine their interim 2025 targets based on a linear reduction between 2020 and 2030;
- enabling flexibilities in certain cases, such as problematic enforcement of source-based legislation, unforeseen events in energy supply and production systems, and particularly cold winters or dry summers;
- facilitating financial support from EU funds to meet the proposal's objectives;
- setting up a European Clean Air Forum made up of representatives of the Commission, national authorities, industry and civil society to facilitate the coordinated implementation of EU air quality policy;
- requiring Member States to update their national air pollution programmes and emission inventories every four years and their emission projections every two years;
- requiring the Commission to publish detailed implementation reports every four years, and to put forward a review by 2025, with specific focus on ammonia and mercury emissions.

The agreement, endorsed by the Committee for Environment, Public Health and Food Safety (ENVI) on 12 July 2016, is expected to be submitted for a final first-reading vote at the November I plenary.

References

[Reduction of national emissions of certain atmospheric pollutants](#), European Parliament, Legislative Observatory (OEIL).

[Review of the Air Quality Policy Framework](#), Initial appraisal of a European Commission Impact Assessment, European Parliament, DG EPRS, 2014.

[Air quality: Complementary Impact Assessment on interactions between EU air quality policy and climate and energy policy](#), European Parliament, DG EPRS, 2014.

[EU air quality policy and WHO guideline values for health](#), European Parliament, Policy Department A, 2014.

[NEC Directive status report 2014](#), European Environment Agency, 2015.

Endnotes

- ¹ Concentration levels also depend on year-by-year variation in weather conditions (including sunlight), emissions of substances and precursors by natural sources, and sources outside Europe.
- ² WHO's International Agency for Research on Cancer [concluded](#) in 2013 that outdoor air pollution (especially particulate matter) is carcinogenic to humans.
- ³ Data are only available for EU countries that are members of the OECD. Data are not available for Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta and Romania.
- ⁴ The Clean air programme for Europe, presented end-2013 together with the proposal, replaces the 2005 [Thematic strategy on air pollution](#).
- ⁵ The main legal acts relate to sources of pollutants from specific sectors, such as road transport ([Euro 5 and Euro 6 Regulation](#), [Directive on clean and energy-efficient vehicles](#), [Directive on volatile organic compounds from petrol](#)), non-road transport ([Directive on the sulphur content of certain fuels](#)), and industry ([Pollution prevention and control Directive](#), [Large combustion plant Directive](#), [Industrial emissions Directive](#)).
- ⁶ [2013 data](#) (latest available) indicate that ten Member States now exceed at least one ceiling.
- ⁷ The proposal is not about air quality standards (atmospheric concentration of pollutants governed by the Ambient Air Quality Directive). In this regard, the Commission intends to focus on compliance with existing air quality standards 'by 2020 at the latest.'
- ⁸ The 'maximum technically feasible reduction' is based on technical measures commercially available in 2012. The impact assessment indicates that because it does *not* take into account a series of measures (such as structural or behavioural ones), 'it can be regarded as a highly conservative estimate of the scope for impact reduction.'
- ⁹ This includes direct economic benefits of over €2.8 billion, including labour productivity increase (€1.85 billion), reduced health care costs (€600 million), and increased crop yields (€230 million).
- ¹⁰ In all cases, the Commission estimates that the cost of compliance for specific sectors would not exceed 1% of gross value added.

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