

Hope is in the air (quality)

Eurocities position on the revision of the EU framework on air quality

Key messages:

Eurocities has the following recommendations on the revision of the Ambient Air Quality (AAQ) Directives and other EU initiatives with an impact on air quality in cities:

- Establish a step-by-step approach to achieve or move closer to the levels for air quality recommended by the health community and WHO
- Adapt the requirements of the AAQ directives to trigger additional measures to reduce population exposure in the long and short-term
- Ensure convergence between the objectives of sectorial legislation on air quality and AAQ directives
- Amend the current governance system on air quality to ensure all relevant levels of governance further collaborate and take relevant actions
- Modify the requirements for air quality plans to ensure they become more effective tools to reduce air pollution and ensure monitoring and modelling of air quality use reflect cities' practices

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Executive summary

Air quality has become an index to measure the quality of life in cities and is one factor to protect human health in urban areas. Local authorities are leaders in improving air quality in many European regions. Nevertheless, despite some tangible results observed, Europe still faces regular high-pollution episodes, which jeopardise people's health. While Eurocities recognises the impact of EU action on air quality during the last decades, we believe that some changes are necessary to reach the objective of halving the number of premature deaths linked to air pollution by 2030. The recent publication of the World Health Organisation (WHO), setting new recommended air pollution guideline values, is an opportunity to build a solid and ambitious framework on air quality

The EU needs to adopt a step-by-step approach to secure a persistent reduction in air pollutants emissions towards alignment with the WHO's recommended levels. A first milestone to reduce most major pollutants should be set in 2030. This approach should be coupled with a more regular review of the EU framework to integrate the latest scientific evidence and adjust the EU objectives for air quality.

This approach also implies including new monitoring requirements for pollutants of concern not currently falling into the scope of the Ambient Air Quality (AAQ) Directives, namely ultra-fine particles, black carbon, and ammonia. EU policymakers should assess the data collected through new requirements with a view to potential regulation of these pollutants.

When it comes to long-term objectives for air quality, Eurocities recommends complementing the current approach in the AAQ Directives to ensure member states take additional measures to further reduce their population's exposure. The current limit values should be accompanied by a binding exposure reduction obligation upon member states. The European Commission should also consider including new requirements to reduce the exposure of the EU population at the regional level.

Regarding the short-term air pollution objectives, Eurocities recommends that the list of pollutants covered by this limit value should remain broadly untouched to ensure the list covers pollutants on which local and regional authorities have the leverage to reduce their concentration.

As some factors such as the topography or the weather can influence air pollution concentration, Eurocities recommends taking these factors into account in EU air quality objectives. However, EU policymakers should set safeguards to preserve the goals of the AAQ Directives.

Air pollution should be addressed at the source to deliver tangible results in improving air quality. In 2022, various initiatives such as the Sustainable Product Initiative or the proposal for Euro 7/VII standards for road vehicles will influence air quality in cities. Coordination between these initiatives is required to ensure they support the objectives in the AAQ Directives.

The objectives of the AAQ Directives cannot be attained without strong governance of air quality. Eurocities recommends introducing joint responsibility of the member states and the EU institutions to strengthen the current governance to reduce air pollution – similar to the one already applied in EU climate law. Member states should also further collaborate with sub-national levels of government to identify potential areas of improvement.

Air quality modelling has developed since the entry into force of the AAQ directives. Eurocities recommends its use under specific conditions. Monitoring requirements, especially the location of monitoring stations, should also be adapted to local specificities.

Finally, the revision of the AAQ Directives should strengthen public information and involvement in the fight against air pollution. Local authorities consider that without people's involvement in air pollution reduction initiatives or without an adequate level of information offered to people, it will be harder to convince them to adapt their behaviour. An EU-wide air quality index or support for the development of citizen science initiatives could bring positive changes.

Introduction

Air pollution is still one of the most overlooked causes of premature deaths in Europe. Even though there are 16 times as many deaths linked to air pollution as road fatalities, they do not often make it to the newspaper's front pages.¹ However, air quality remains a concern for many people in Europe, especially in cities. According to the special barometer on air quality², people expect further actions by the European Union. Eurocities also shares this assessment. From a city perspective, improving air quality is a way to protect people's health and ensure that cities remain liveable. City authorities have been implementing air quality reduction measures for decades, with some measures like low emission zones dating back to the nineties.

Beyond the well-documented impact of air pollution on human health and biodiversity, recent developments have shown that tackling air pollution can make a difference for people. Some studies show that air pollution influenced higher mortality for patients with Covid-19 infections³. Patients exposed to high NO₂ & PM concentration levels were more likely to develop severe symptoms. By tackling air pollution in cities, local authorities also mitigate the effect of global pandemics.

Cities are taking bold actions to address the issue of air quality. From scrapping schemes for heating devices in Warsaw to creating a low emission zone in Valencia⁴, everywhere in Europe, local leaders have shown their ability to take the matter seriously. Yet, exceedances of air pollution levels are still expected as evidenced by the number of infringement cases opened by the European Commission⁵.

The Covid-19 crisis and subsequent measures adopted by national governments were a revelation for many on air quality in cities. In Madrid, for instance, a reduction of 71% of NO₂ pollution caused by traffic has been observed during the most stringent phase of Covid measures. Inhabitants could breathe cleaner air and suffered less from common respiratory diseases. This crisis allowed policy makers to assess the improvement needed to attain a less harmful level of air pollution in Europe.

Eurocities welcomes the ambition of the European Commission to revise the EU framework on air quality, particularly the Ambient Air Quality (AAQ) directives. The European institutions can count on the support of local authorities to deliver on the ambitions of the EU Zero Pollution Action Plan to halve the number of premature deaths linked to air pollution by 2030. Yet, this objective will not be achieved without changes in the EU regulatory framework for air quality.

¹ According to the Commission's 2019 road safety statistics 22 800 road fatalities were recorded in the EU compared to 364 200 premature deaths linked to air pollution, based on the EEA Air quality in Europe 2021 report

² See Attitudes of Europeans towards Air Quality, Special Barometer 497, September 2019

³ Impact of air pollutants on viruses/virus infections – a systematic literature review and meta-analysis, Dr. Regina Pickford, Margarethe Woeckel, Dr. Alexandra Schneider, Prof Dr. Annette Peters

⁴ See more examples on Eurocities website: <https://eurocities.eu/latest/air-quality-and-noise-pollution-are-major-concerns-for-european-cities/>

⁵ From 2008, date of the entry into force of the Ambient Air Quality Directives, the Commission opened more than 50 infringement cases against Member States for failure to comply with the EU framework on air quality; according to the European Commission website, infringement proceedings on air quality represented 16% of the total volume of infringement cases in the environmental sector.

Setting a common direction on air quality in Europe (Policy Area 1)

As the WHO recently unveiled its new recommendations on acceptable levels of air pollution for human health and biodiversity, it is now up to the EU to turn them into tangible actions. It will require policymakers to address both the way long-term objectives are set and short-term standards to tackle pollution episodes.

Setting the right level of ambition for Europe on air quality

Scientific expertise on air quality is a constantly evolving field. More and more evidence is being gathered on the impact of air quality on people's health, biodiversity, and city liveability. This expertise is essential to ensure that air quality policies reflect the latest scientific consensus. The World Health Organisation (WHO) is the leading scientific authority on health effects linked to air quality, and their guidelines are the most solid benchmark for setting ambitious air quality standards. Their recent update is the opportunity to align the decade-old EU framework on air quality with the golden standard of WHO.

Eurocities supports the long-term objective of air pollution reduction enshrined in the WHO recommendations to achieve cleaner air in urban areas. This objective will require efforts on all political levels from public authorities, stakeholders, people, and civil society.

A step-by-step approach is essential in the next EU framework on air quality. The future framework should set 2030 as the first date for compliance with updated legally binding AAQ standards for PM_{2.5}, PM₁₀, toxic PM components like BaP, lead, nickel, cadmium, arsenic and gaseous pollutants like NO₂ and benzene. This would allow public authorities to adapt or develop air quality plans according to this objective. For ozone, Eurocities recommends retaining a target value to trigger national measures to curb precursor emissions effectively, given the secondary and long-range nature of this pollutant.

Our experience has shown that a more systematic review of air pollution standards is needed to reflect scientific progress in better understanding the negative health impact of air pollution. As emphasised by the 2018 Court of Auditors special report⁶, certain standards enshrined in the AAQ directives were adopted in the nineties, long before the adoption of the 2005 WHO recommendations that served as a baseline for the current AAQ directives. Five years should be adequate for the European Commission to organise a structured review of the scientific evidence on air quality standards.

Regarding the sources of scientific expertise, the WHO guidelines should remain the primary benchmark for AAQ standard setting in the EU as in the Zero Pollution Action plan. In addition, other competent and independent scientific review processes of health effects from air pollution, e.g. by the Health Effects Institute, should be considered.

Recommendations:

- Set 2030 as the first compliance date for limit values/target values for PM_{2.5}, PM₁₀, toxic PM components like BaP, lead, nickel, cadmium, arsenic, and gaseous pollutants like NO₂ and benzene
- Ensure a systematic review of EU air quality standards every five years to ensure all pollutants are regulated based on the latest scientific evidence

⁶ Special report no 23/2018: Air pollution: Our health still insufficiently protected

- Beyond 2030, work towards achieving the WHO recommended levels of air pollution as soon as possible

Capture new developments on pollutants of concern

As scientific and measuring techniques progress, new evidence is available on emerging or already existing sources of air pollution. For instance, this is the case for ultra-fine particles, which can go deeper into the lungs and cause systemic health effects for exposed populations. AAQ directives must be future-proofed by adding new pollutants or modifying the existing provisions on pollutants to maintain their role in preserving human health and biodiversity. The following pollutants should be prioritised in the future AAQ directives:

- **Ultra-fine particles (UFP):** ultra-fine particles are particles with a diameter of 0.1 μm (100 nm) or less⁷. These particles may result from natural or anthropogenic sources such as combustion activities. Despite growing evidence on their impact on health, these pollutants are not regulated by AAQ directives. However, more UFP data is needed, particularly in populated urban areas to strengthen the epidemiological evidence for adverse health effects related to UFP exposure. EU-funded projects and testing in cities⁸ are currently gathering evidence to better understand the dynamics and sources of UFP. As a first step, the Commission should include these particles in the directive's scope for monitoring purposes and mandate the creation of measurement standards for UFP to secure harmonised measurement methodologies in the EU.
- **Black carbon (BC)** are fine particles generated by the combustion of fossil fuels or biomass. Black carbon has adverse effects on health, provoking heart or lung diseases, but it is also a short-lived climate change accelerator, with a warming impact 460-1,500 times stronger than CO₂⁹. Curbing black carbon emissions would create co-benefits for human health and climate. While we still lack data to set a limit value for BC, setting an air quality standard encompassing an obligation for concentration reduction would be a first step to reducing black carbon/elemental carbon. We strongly recommend including monitoring requirements for black carbon at the selected regional background, urban background, and traffic stations. There is already a harmonised CEN standard for measuring it at rural sites, which is being adapted to allow consistent measurements in urban areas, including traffic sites. The Commission should include this standard in the AAQ directives once adapted.
- **Ammonia (NH₃)** is a precursor of PM_{2.5} and is mainly derived from agriculture activities. Eurocities recommends including it in the scope of the directive given its role in the formation of fine particle production and the loss of biodiversity. New monitoring requirements should be included at a selected number of supersites, measuring other important components to understand the chemical processes in the atmosphere. Further monitoring will help to validate emission data and dispersion model results essential for source apportionment and the derivation of efficient abatement measures.

⁷ Kwon, HS., Ryu, M.H. & Carlsten, C. Ultrafine particles: unique physicochemical properties relevant to health and disease. *Exp Mol Med* 52, 318–328 (2020).

⁸ Information on Paris testing on UFP

Recommendations:

- Include monitoring requirements for ultra-fine particles, black carbon and ammonia to understand emissions and dynamics of these pollutants better. Data collected on these pollutants should serve to assess the opportunity to regulate emission levels of these pollutants
- Support the development of relevant measurement standards to ensure a harmonised assessment of these pollutants across the EU

Incentivising further actions on air quality by all levels of governance (Policy Area 2)

Adjustments to the EU framework on air quality are required to achieve WHO recommendations on air quality. Local authorities will be able to further act on air pollution emission reduction, if national and regional governments are encouraged by a robust EU framework on air quality.

Improving air quality goal-setting in the EU framework

a) Addressing the current limits on long-term air quality objectives

The current framework of ambient air quality objectives for PM_{2.5} consists of two main pillars, which are generally still relevant

- (1) **Legally binding limit values (LV)** are defined as an absolute concentration threshold to be met almost everywhere, especially at hot-spots with high population exposure.
- (2) A '**national average exposure reduction approach**' underpinning the 'hot-spot limit values', which requires a percentage reduction of the urban population exposure, based on the average levels reported at a predefined number of stations across a member state

However, several shortcomings of the current framework have been identified:

- i. Pillar (2) is only a non-binding objective 'to be attained where possible', requiring only 'measures not entailing disproportionate costs'. This approach does not sufficiently incentivise member states to reduce the average exposure of the population. As a result, many member states will probably fail to meet the national exposure reduction target. This will also not trigger national measures to reduce air pollution at the regional level and in densely populated areas. Moreover, meeting pillar (1) with local measures is difficult, if not impossible, unless dedicated measures are adopted to reduce air pollution background levels.
- ii. The effectiveness of the existing hot-spot approach (1) in reducing the general population's exposure in cities and the emerging health risk is limited. Exceedances of the limit values usually trigger measures focused on local emissions around the hot-spot. Rather than reducing the population's exposure in a whole city, this hot-spot approach aims to mitigate local pollution peaks, with limited health benefits. This is the case for NO₂ and the implementation of street-wide diesel bans for instance, where diesel vehicles are redirected in the surrounding streets, where levels stay below the limit value but above the level of air pollution causing health effects.

- iii. Moreover, the hot-spot approach (1) makes it hard to set new ambitious limit values closer to WHO guidelines. These new values should be feasible both for hot-spot areas and sufficiently ambitious to trigger measures in other less polluted regions or parts of an urban agglomeration where unhealthy levels above the WHO guidelines still occur. As a result of the hot-spot approach, any new absolute limit value would still be set at a relatively harmful concentration level to be achievable in hot-spot areas. While the compliance burden would almost entirely rest on these areas, large parts of the EU would lack the pressure – or the legal justification – to do more to protect their population against pollution levels that are still above the WHO guidelines.

Despite the shortcomings described above, binding absolute limit values (pillar 1) have been and will continue to be a key driver for reducing air pollution and improving air quality, where the highest concentrations occur. Eurocities recommends maintaining them as part of the future EU framework and the provisions requiring member states to reduce the average exposure of the population to PM_{2.5}. Provisions are necessary to force member states to take national measures to reduce the large-scale levels of background pollution.

Eurocities would welcome certain amendments to secure the path of the Zero pollution Action plan in terms of air quality:

1. Drop the existing absolute ‘exposure concentration obligation’, which requires member states to reach a certain threshold of air pollutant concentration. As it is defined as an absolute value, similar drawbacks and constraints apply as described under iii., when trying to set a more ambitious threshold.
2. Address the shortcomings identified under i. by strengthening the provisions on the national exposure reduction target for PM_{2.5}, turning it into a legally binding national exposure reduction obligation (NERO), and lowering the initial concentration objective to a level below the WHO guideline of 5 µg/m³. NERO should be achieved in the medium term by 2030 as the deadline by which the commitments of the National Emission Reduction Commitment (NEC) Directive¹⁰ have to be achieved, driving additional national emission control measures. Setting a simultaneous obligation to reduce the national average of the population exposure to PM_{2.5} allows assessing whether the national programmes triggered by the NEC Directive delivered a sufficient reduction of the PM_{2.5} background levels. If not, additional national measures must be taken to meet the national exposure reduction obligation by 2030. As a NERO to be met by 2030 should only be seen as an interim step, a second long-term step could be created by setting a non-binding national exposure reduction target for 2035. It should be combined with a revision clause requiring an update of the NEC Directive with an extended emission reduction commitment by 2035 to stimulate additional national measures to deliver the requisite exposure reduction to approach WHO recommendations.
3. Given the limitations of the current hot-spot approach, the existing (national) exposure reduction approach should be developed further specifically for agglomerations and regions,

¹⁰ The NEC directive sets national emission reduction commitments for Member States and the EU for five nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO₂), ammonia (NH₃) and fine particulate matter (PM_{2.5}).

where the concentrations of PM exceed WHO guideline levels. An additional regional exposure reduction objective (RERO), determined as a relative value, would be achieved within a given period and should be closely synchronised with the NERO. The objective would be set based on the existing exposure levels in each agglomeration, measured in the urban background at a defined number of representative monitoring sites in a region and/or agglomeration, or derived from air quality modelling or a combination of both. While the absolute limit value would tackle the worst pollution at the hot-spots, this new objective could provide city authorities located in medium-polluted regions with a legal lever to deliver more widespread air quality improvement. It is worth noting that the scientific health community has endorsed this approach based on population exposure¹¹.

Recommendations:

- Maintain limit values as one of the key drivers of the AAQ directives to reduce air pollution in the EU
- Delete the ‘exposure concentration obligation’, which prevent policymakers from setting new ambitious limit values closer to WHO guidelines
- Strengthen the obligation for member states to reduce the exposure of the population at a national scale by turning the ‘National PM_{2.5} exposure reduction target’ into a binding ‘National PM_{2.5} exposure reduction obligation’ to be attained by 2030. A second non-binding step should be set by 2035 to secure the reduction of PM_{2.5} exposure.
- Lower the initial concentration objective to a level below 5 µg/m³, recommended by the WHO guidelines.
- Consider the need to complement the national exposure reduction approach as well as the hotspot approach with a third pillar based on a regional exposure reduction objective.

b) Addressing short-term pollution episodes

Short-term pollution episodes are common in many European cities. They can result from air pollutant concentrations and meteorological conditions, such as ozone or fine particles. The current AAQ directives establish short-term limit values for SO₂, NO₂, benzene, carbon monoxide, lead and PM₁₀ to limit the occurrence of these episodes. Short-term (24h) standards are important to protect peoples’ health due to the short-term impact of high pollution episodes on health. In its new guidelines, the WHO also supports this short-term approach. It also sets information and alert thresholds and requires public authorities to adopt short-term action plans. These provisions ensure public health protection during pollution episodes.

There is an ongoing discussion on whether to include other pollutants in the scope of these short-term values. Eurocities recommends amending the current list of pollutants in the scope of these provisions. There is little added value in setting a short-term limit value for PM_{2.5} next to one for PM₁₀. It is justified as during PM pollution episodes, the fraction of the fine particles is dominated by a significant large-scale background level of secondary particles, which local and short-term measures cannot reduce.

¹¹ see <https://doi.org/10.3389/ijph.2021.1604465>, B. Hoffmann et al: WHO Air Quality Guidelines 2021–Aiming for Healthier Air for all: A Joint Statement by Medical, Public Health, Scientific Societies and Patient Representative Organisations

Evaluation of PM₁₀/2.5 data in Berlin has shown that local authorities' ability to mitigate short-term pollution episodes is decreasing.

Moreover, the WHO determined the 24h guidelines from the (higher) relative risk of long-term health effects. An additional 24h limit value for PM_{2.5} will not provide any additional health protection beyond that triggered by the annual PM_{2.5} limit. Instead, Eurocities recommends adding this pollutant to the list of pollutants subject to information and alert threshold to raise public awareness and foster actions by authorities.

Recommendations:

- Maintain the current short-term limit value for PM₁₀
- Add PM_{2.5} to the list of pollutants subject to information and alert threshold

Including local specific conditions affecting air quality in cities

When it comes to improving air quality in cities, local authorities do not have the same starting point. While Northern Europe enjoys conditions favourable to the dispersion of air pollutants, certain cities are subject to specific orographic and meteorological factors that negatively impact air pollution levels. For instance, if the Po Valley benefitted from the same meteorological conditions as the ones observed in other parts of Europe, the levels of PM₁₀ concentration would be 50 to 70% lower than the currently reported levels¹². Given the contribution of these factors to air quality levels, Eurocities proposes taking them into account in the attainment of air quality values in the AAQ directives. The specific orographic and meteorological factors governing the dispersion of pollutants should be carefully assessed and defined in the EU framework to ensure its effectiveness. If derogations are applicable for these regions, their implementation should be based on a specific assessment methodology and clearly defined criteria.

Additionally, due to higher effort needed to obtain lower concentrations, areas with certain orographic and meteorological factors on air pollutant dispersion would benefit from specific funds and funding terms (see also section 'Making air quality governance fit for a cleaner air in Europe').

Recommendations:

- Take into account the particular situation of certain areas in Europe regarding the negative contribution of orographic and meteorological conditions in the attainment of air quality values
- Provide EU and national funding to address the challenges faced by these regions

Tackling all sources of air pollution consistently

The AAQ directives regulate the main pollutants of concern for human health and biodiversity, without setting binding levels for each source of air pollutant as they are covered by sector-specific regulations. This may lead to situations where sector-specific regulations, aiming to ensure freedom of movement of goods, may lead to a lower level of ambition regarding air quality. As many EU directives and

¹² Deserti M., Emilia Romagna Region - Il contributo del progetto Prepair al Clean Air Dialogue sulla qualità dell'aria. Project meeting 29 May 2019, Bologna)

regulations with an impact on air quality will be revised in 2022, Eurocities recommends a coherent revision of this legislation to reach the ambitions of the future AAQ directive.

a) Setting the right standards on vehicle air pollutants for the last generation of ICE vehicles

Vehicle emissions are still an important source of air pollution in cities. In 2018, Airparif, the organisation that is responsible for monitoring air quality in the Paris agglomeration, reported that road traffic was responsible for 56% of NO_x and 23% of PM_{2.5}. However, air pollution from road transport is avoidable. From 2005, when the Euro 4 standards came into force, to 2018, when Euro 6c started to be applicable for all vehicles put on the market, NO_x emissions and PM_{2.5} emissions decreased by 52% and 49%, respectively. It can be explained by cities' efforts to reduce road traffic but also by stricter vehicle emission standards. As the European Commission is about to update these standards and develop the last generation of air pollutant standards for road vehicles before the phase-out of fossil-fuelled vehicles, Eurocities requests an ambitious new standard to deliver cleaner air in cities, reflecting driving in urban conditions¹³. Provisions should be avoided allowing a vehicle to emit more than the authorised maximum during the first kilometres travelled.

Recommendations:

- Ensure swift adoption of the Euro 7 proposal, to avoid delaying the entry into force of new standards
- Maintain consistency between the objectives set by the Euro 7 standards and those set by the AAQ directives
- Introducing testing procedures and limits that are technology-neutral and fuel-neutral
- Include all relevant air pollutants in the scope of the future regulation, including non-exhaust air pollutants like break-wear particles and metal oxides
- Limit the complexity of the regulation
- Ensure the rules deliver adequate air quality improvement in cities, limiting the possibility of vehicles emitting more than authorised during the first kilometres travelled.

b) Eco-design requirements

In cities, the residential sector also generates air pollution such as fine particles or NO_x, mainly due to heating devices. The environmental performance of heating devices falls under the scope of the Eco-design directive and subsequent implementing regulations¹⁴, which mandates requirements on the environmental performances of these devices, including air quality. However, some studies point out that 'moderate ambition levels, along with the long transition periods of the Ecodesign Regulations and the long lifespan of heating appliances, tend to limit the impact of these measures'¹⁵. The upcoming revision of the eco-design directive should be an opportunity to strengthen the directive's requirements, ensuring a swift launch of devices emitting fewer air pollutants.

¹³ See for instance Eurocities/Polis joint letter on Euro 7, March 2021, <https://eurocities.eu/wp-content/uploads/2021/05/210517-Join-letter-Eurocities-Polis-on-Euro7.pdf>

¹⁴ Commission Regulations 2015/1185 and 2015/1189 limiting the emissions of solid fuel space heaters and boilers

¹⁵ Nagl et al. (2016) Implementation of the Ambient Air Quality Directive

More flexibility should be given to member states and local authorities to set stricter emission standards in situations where residential heating is as an essential contributor to air pollution. It should also be allowed when the compliance with the limit values for PM_{2.5} is at risk or would not be achieved without further actions on small combustion emissions.

New design rules to improve the air quality performance of heating devices must also be accompanied by measures to encourage people to replace their heating devices with more environmentally friendly options.

Recommendations:

- Strengthen air quality requirements for heating devices as well as other devices that have an impact on air quality as part of the revision of the Eco-design directive
- Allow member states to set more stringent requirements in situations where the heating sector has been identified as the primary contributor of air pollution and when no further action would lead to the non-compliance with PM 2.5 limit values
- Dedicate national or EU funds, such as the Climate Social Fund, to foster the replacement of heating devices

c) Emissions from the agriculture sector

The agricultural sector is one of the main sources of ammonia. According to the first Clean Air Outlook, mineral fertiliser application contributes approximately 20% to total NH₃ emissions¹⁶. About 75% of all NH₃ emissions in the EU-28 are caused by manure management from livestock farming. Under the NEC directive, member states are required to decrease their level of NH₃ emissions. Yet, this instrument has not been effective in triggering further actions by member states.

As mentioned before, NH₃ emissions are a key precursor of secondary PM formation with a non-linear relation between emissions and generated secondary particles. Unless NH₃ emissions drop significantly, secondary PM will not decrease significantly even if NO_x and VOC emissions decrease further. The agricultural sector must drive prevention policies to avoid high PM_x episodes, especially in higher pollution periods (i.e. winter).

Recommendation:

- Review the NEC directive to strengthen NH₃ emission reduction commitments considering the likely cost-effectiveness of NH₃ control measures in agriculture

d) Non-Road Mobile Machinery.

Non-Road Mobile Machinery (NRMM) is a vast category, including engines for everything from handheld tools to snowmobiles. NRMM is regulated at the EU level through Regulation 2016/1628, which sets emission standards for NO_x and PM emissions from NRMM engines. The significance of NRMM for local air quality in cities is variable both in scale and in which sub-categories are most locally

¹⁶ See Report from the Commission to the European Parliament, the Council, the European Economic and Social committee and the Committee of the Regions, the first clean air outlook, January 2019

significant. Eurocities has identified two main categories to be addressed: construction machinery (largely engines in categories NRE and NRG), and inland shipping (engines in categories IWP and IWA).

Construction machinery

In certain countries, cities can set stricter environmental standards for the machinery used for local construction projects. Across Europe, several cities are implementing zero emission construction sites with low or zero emission machines.

In the United Kingdom, London's NRMM Low Emission Zone has successfully transformed the local fleet of NRMM and, in doing so, has highlighted some issues that complicate the use of local restrictions to reduce emissions. A key issue is the possibility to uniquely identifying machines, both for the basic compliance requirement and supporting retrofit use.

In other parts of Europe, the experience of cities that are part of the Big Buyers for Climate and Environment initiative¹⁷ shows that demand from zero emission construction sites is increasing. However, market solutions are still not widely available. Also, this machinery is still primarily used in pilot projects, leading to higher costs and challenges for the construction sites, especially if they are far away from an electric grid.

Despite the provisions of Articles 15 and 32 of regulation EU 2016/1628, it is often difficult to locate the statutory marking on the engine. In almost all cases, it requires stopping work so that the machine can be made safe, and the engine accessed, adding to the cost of regulation for the operator and the authority.

However, without an agreed national or international marking for agreed retrofit, or a standard method for identifying individual machines, it is complex and time-consuming to identify retrofitted machines as they move from site to site.

For some specific machine types, hybrid and zero emission alternatives are rapidly maturing technologies. Unfortunately, as most of these are battery-powered, diesel generators are often still needed to provide power, which diminishes the overall reduction in emissions.

Any future development for the next generation of emissions standards for NRMM (so-called 'stage 6') should explicitly support zero emission for sub-categories where the technology is maturing and continue to reduce emissions in the harder to treat categories (especially very small and very large engines).

Inland shipping:

Inland shipping is another source of air pollution that policy makers should address. Emissions from this sector also fall under the scope of the NRMM regulation. However, further evidence indicates that more can be done to reduce air pollutant emissions from this segment. As emphasized by a report

¹⁷ The Big Buyers for Climate & Environment is a European Commission initiative to promote collaboration between big public buyers in implementing strategic procurement strategies, more information available at <https://bigbuyers.eu>

published by the European Commission¹⁸, there is a significant potential to reduce emissions by retrofitting the inland vessel fleet, 70% of which still consists of completely unregulated engines with extremely high emissions of toxic and black diesel particles. According to the report, the share of these polluting vessels would still exceed 50% in 2030 unless further measures are taken. Moreover, current emission standards for smaller engines still do not require a diesel particle filter, a well-functioning and efficient standard emission control technology.

The Commission has not yet met the review obligations under Art. 60 of the NRMM regulation, which requires the Commission to assess the opportunity to propose harmonised measures *‘for the installation of retrofit emission control devices in engines’* already placed on the market and to *‘address technical measures and financial incentive schemes as a means of helping member states to comply with Union air quality legislation, by assessing possible action against air pollution in densely populated areas’*.

We would also urge the Commission to present a report *‘regarding the assessment of the further pollutant emission reduction potential, on the basis of available technologies and a cost-benefit analysis’*.

Recommendation:

- Develop common markings for new and retrofitted NRMM to help support local controls.
- Develop an EU-wide retrofit programme and/or requirements for those NRMM applications, where such measures are considered cost-effective and beneficial for meeting the goals of the Zero Pollution Action Plan. The programme should look at ways to ensure market operator provide guarantees and maintenance on retrofitted machinery
- Assess the emission control potential that could be exploited by a subsequent update of the emission standards for NRMM
- Accelerate the development of NRMM stage 6 restrictions to promote zero-emission technology and broader emission reductions.

Making air quality governance fit for cleaner air in Europe

Strengthen the efficiency of public actions on air quality

Under the current EU framework, air quality governance relies on the member states and the authorities designated by national authorities to monitor and reduce air pollution. While we believe that the member states should remain the *de jure* primary responsible authorities, we believe that some amendments to the current framework should be introduced to ensure the achievement of the objectives set out in the AAQ directives.

a) Ensuring joint action of the EU and the member states on air quality

Even though member states, regional and local authorities are often better placed to adopt measures to achieve EU air quality objectives, the EU institutions also have a responsibility to attain these

¹⁸ Technical support for the review obligations under Regulation (EU) 2016/1628 (NRMM), Mellios, G., Kastori, M., Zierock, K-H., March – 2019

objectives. By setting the goals in terms of air quality and adopting sectorial legislative initiatives impacting air quality, as described above, the public expects the EU institutions to adopt initiatives aligned with the EU framework on air quality.

There is already a precedent for joint responsibility: article 2 of the EU climate law¹⁹ forces them to ‘take the necessary measures at Union and national level’ to achieve the EU's climate objectives. As highlighted by the Fit for Future Platform opinion on AAQ directives²⁰, adding a similar incentive for collective action on air quality would ensure all relevant actors take measures to achieve the ambitions of the Zero Pollution Action Plan.

Eurocities proposes a more elaborated reporting scheme between the Commission and the member states to reduce the average exposure of the population and the underlying ‘governance’ problem of a fair sharing of the compliance responsibility among regions, cities, national governments and the European legislator. While the member states should be obliged to regularly report to the Commission on the implementation and projection of air quality, they should also be able to request the revision of the relevant source-related regulations by the Commission to meet the air quality objectives. The Commission should have to assess the proposal and provide an answer to the member state. The Commission should justify its response, whatever its decision. The suggested expansion of the reporting process on EU-related measures, together with the proposed inclusion of a ‘joint responsibility’ clause, will reinforce the national governments’ actions on air quality and, eventually, mean regions and cities could put in place additional measures to comply with limit values.

Recommendations:

- Add a provision in the AAQ directives mandating member states and the EU institutions to take all the necessary measures at European and national level respectively, to enable the collective achievement of the EU air quality objectives
- Include a possibility for member states to request a revision of the relevant EU regulation that they consider necessary for the attainment of air quality objectives

b) Further developing collaboration between levels of governance

Under the current AAQ directives, member states designate the responsible authorities for the assessment and approval of measurement systems, ensure the accuracy of measurements, and organise collaboration with other member states and the Commission. Member states also define zones and agglomerations for which the responsible authorities take care of air quality management. In Italy, for instance, regional authorities are responsible for monitoring air quality, whereas in other parts of Europe, local authorities are responsible. The allocation of responsibilities should be based on a systematic dialogue with local and regional authorities to determine the actor with the most relevant competencies to tackle air pollution.

¹⁹ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (‘European Climate Law’)

²⁰ Available on https://ec.europa.eu/info/law/law-making-process/evaluating-and-improving-existing-laws/refit-making-eu-law-simpler-less-costly-and-future-proof/fit-future-platform-f4f/adopted-opinions_en

Moreover, the AAQ directive should encourage member states to set up coordination platforms involving the sub-levels of governance to ensure a constant dialogue, taking into account national governance structures and the principle of subsidiarity. An excellent example that could be replicated in all member states is the National Air Cooperation Programme (NSL) currently being implemented in the Netherlands.²¹

Recommendations:

- Require member states to consult local and regional authorities in the definition of zones and agglomerations, and the responsible authorities for air quality management and assessment in these zones
- Support the establishment of a platform on air quality in all member states to ensure constant dialogue with national, regional, and local authorities and identify the relevant measures, including joint measures to address short-term pollution peaks

Improving air quality management and monitoring in cities**a) Better air quality planning**

The Ambient Air Quality Directives require the establishment of air quality plans in cases where limit for air pollution are exceeded. It is up to the designated responsible authorities to design and implement these plans. In various countries, air quality plans are set at the regional level. In some cases, local authorities have also set up their own air quality plan or strategy.

Yet, air quality plans can fall short and lack the necessary flexibility to achieve tangible results on air pollution reduction. To ensure the effectiveness of these air quality plans, Eurocities recommends adding a requirement in Annex XV of the AAQ Directive, requiring the competent authorities to review their air quality plans every three years based on their latest projections. It would allow public authorities to react much more promptly and limit exceedance situations. In situations of exceedance where the attainment deadline is already expired, the air quality plan should limit the exceedance period to a maximum of two years.

Even though the adoption of air quality plans by local authorities is not mandatory in certain situations, the latter often use the requirements of the AAQ Directive on air quality plans as a reference framework. However, Annex XV falls short regarding the variety of actions to tackle air quality. Eurocities would welcome a more detailed list of actions at the disposal of the competent authorities. A common EU approach on the management of short term action plans would be helpful to implement effective actions on reducing primary pollutants and emissions of precursors of secondary pollutants, supporting compliance with short term limit values (see Eurocities recommendations under ‘addressing short-term pollution episodes’).

Recommendations:

²¹ More information: <https://www.government.nl/topics/environment/air-quality/measures-to-tackle-air-pollution>

- Include a review requirement in Annex XV of the AAQ directive so that air quality plans are reviewed every three years
- Limit the exceedance period to a maximum of two years after the deadline for attainment, while ensuring that the EU and member states live up to their shared responsibility to help achieving this.
- Provide EU guidance for drafting and implementing air quality plans²²
- Establish a common list of actions for short term action plans to manage different pollutants (PM, NO₂, SO₂ at least), and the number of days recommended for their implementation, taking into account the short-term effects on health.

b) Better air quality management

The future EU framework should help local and regional authorities to better manage air quality and adopt measures based on the assessment of various factors. In an ideal world, local authorities would be able to take decisions, bearing in mind the expected gains in public health impact. It would help authorities quantify the result of their actions while improving communications towards the public on the benefits of measures adopted. Unfortunately, carrying out a health impact assessment can be difficult for many local authorities. The adoption of the new EU framework on air quality should be accompanied by new guidance to help public authorities to carry out such assessments. In addition, public authorities often look for information on how public authorities located in other countries address air pollution issues. Cities network such as Eurocities have a key role in these exchanges of best practices. There is currently no common tool to assess the impact of air quality plans. The European Commission should develop common assessment methodologies to further guide the action of public authorities on air quality.

Beyond technical support, the EU should also propose a new dedicated funding instrument to help address air pollution at local and regional level. As emphasised in the joint paper published by the Urban Partnership on air quality²³, there is a lack of specific funding for projects dedicated to air pollution reduction and for drafting and implementing Air Quality Plans. This funding could foster capacity building on air quality in public administrations or finance scrappage schemes to help people to replace their polluting vehicles or heating systems.

Recommendations:

- Provide EU guidance for the health impact assessment to support the adoption of air pollution-related measures by local authorities
- Provide EU guidance for the assessment of air quality plans in the EU, especially on the measures taken based on these plans
- Provide specific and targeted EU funding tools to support local authorities' capacity building on air quality and support local schemes to limit the sources of air pollution

²² A starting point could be the 'Code of Good Practices for Cities Air Quality Plans', Partnership on Air Quality - EU Urban Agenda, ISBN-A 10.978.88944135/02, <https://doi.org/10.978.88944135/02>, available on <https://futurium.ec.europa.eu/en/urban-agenda/air-quality/library/code-good-practice-designing-and-implementing-air-quality-plans>

²³ See Position Paper on the Fitness Check of the EU Ambient Air Quality Directives, 2019, available [on futurium](#)

c) Better air quality monitoring and modelling

i. Modelling

Modelling has made significant progress and gained importance in air quality assessment and management since the current AAQ directives were implemented and the relevant provisions on the use of models came into force.

As model uncertainty is higher than monitoring (including indicative measurement techniques of good quality), new provisions on model use should distinguish between different model applications.

There are only a few cases where modelling should be mandatory, and exemptions should be foreseen.

Recommendations:

When addressing modelling in the next AAQ directives, EU policymakers should consider:

- In general, requirements to limit modelling uncertainty should be tightened, and the method of model validation with monitoring data should be clearer to ensure it meets quality requirements.
- Air quality forecasts over more than 24h are not feasible without applying air quality dispersion models. Generally, air quality forecasting should remain voluntary unless there is a risk of exceedances of alert/information thresholds or short-term limit values. Model application should remain voluntary but is strongly recommended for situations with frequent episodes of pollution concentrations above short-term standards.
- Compliance checking should be based on the best quality data available, especially when air quality levels are close to limit values. However, in urban areas of a certain size ('agglomerations') modelling should ensure that no hot-spots – where levels are likely to exceed the limit values – are missed. The final step of compliance assessment should always rely on quality-assured monitoring data rather than on modelled data alone unless concentrations are either well below or considerably above the limit values.
- Modelling is indispensable to assess population exposure and/or the number of people exposed to levels above air quality standards, at least for agglomerations with likely exceedances of air quality standards (limit values, target values, alert/information thresholds)
- While air quality mapping can be achieved by statistical interpolation and extrapolation methods, modelled data improves the mapping result if combined with monitoring data, e.g. data assimilation. Modelling is highly recommended for mapping, in particular in areas with higher spatial complexity
- Modelling is essential to review the quality and design of AQ networks, to find gaps and flaws in the existing networks, especially to improve the macro siting of existing stations and to adequately deploy new (additional, indicative) instruments, in particular in case of likely exceedances of AQ limit values.

- While modelling is a smart and cost-effective way to quantify source contributions (especially when models are applied for other purposes anyway), other source apportionment methods also exist (e.g. receptor modelling), which allow robust estimation of the source contributions.
- Reliable medium- (5 years) and long-term future (>2030) projections are not possible without calculating emission reduction scenarios with models. This type of model application should be mandatory unless air quality levels are likely to fall considerably below the limit values.
- Additional efforts are needed by the Commission and member states to enhance the quality of emission estimation methods and to maintain their quality, especially for important and ever-present source sectors, like road transport (e.g. the HBEFa emission factor database). Likewise, the modelling of the impact of economic measures - although gaining importance in AQ management - is tricky and uncertain, where local authorities require more assistance in terms of guidance and harmonisation. Both are best organised at the EU level, ensuring adequate long-term funding of existing activities.

ii. Monitoring

Monitoring plays an essential part in assessing air quality in the EU. It can serve to ensure compliance or validate air quality modelling. The current AAQ directives define the number of monitoring stations and rules for siting monitoring stations. However, 'official' monitoring stations are still relatively costly for local authorities to install and may deter public authorities from installing more monitoring stations than the amount required by law. This situation can prevent local authorities from getting a comprehensive overview of air pollution levels in their city. In certain cities, micro-sensors have been used to complement data collected through official monitoring stations, but some issues regarding the reliability of these sensors have been reported. Further actions such as an EU-wide certification of high-quality micro-sensors could help local authorities further rely on these devices for monitoring purposes.

In addition, the rules on the location of monitoring stations, as laid out in Annex III of the directive, do not necessarily ensure a good representation of air pollution in cities. The revision of the AAQ directives is an opportunity to improve the requirements regarding the location of the monitoring stations. Local and regional authorities can provide input on improving these requirements.

Recommendations:

- Improve the rules on the location of sampling points to better reflect the urban environment
- Develop certifications for micro-sensors to ensure that only reliable devices are being used for air quality assessment

d) Better information & involvement of inhabitants

Information is key to convincing people to adopt more environmental-friendly behaviours. Harmonised information requirements in the EU could help people to access more reliable information, common to all member states. Since 2017, the European Environment Agency has used

the European Air Quality Index to provide harmonised information. This index has proved to be more reliable than other air quality indexes. The European Commission should encourage the use of this index and expand the data available for its compilation.

Local authorities are keen on better informing people about the health impacts of air pollution. Raising awareness is a way to influence behaviour on air quality and foster behavioural change. Yet, when it comes to the level of information to be communicated, local authorities are sometimes not well equipped to select the relevant information based on scientific recommendations. EU Guidance on the type of science-based information to be shared be communicated to inhabitants, especially in cases of high-pollution episodes, would be welcome by local authorities.

Initiatives to favour citizen involvement in air quality are also more and more widespread in European cities and regions. In Antwerp in 2016, the CurieuzeNeuzen initiative involved inhabitants in measuring nitrogen dioxide levels in the city. The initiative raised awareness on air pollution and was followed by a similar exercise at regional level. Current ongoing projects like the CitiMeasure project²⁴ are looking at ways to develop common guidance to help build similar projects in Europe. Lessons learned from this project should be reused by the European Commission to disseminate these practices.

Recommendations:

- Encourage the use of the European Air Quality Index as a single index of air quality across the EU
- Provide material for use by authorities to inform their population on how to reduce personal exposure levels during high pollution episodes, especially for the most sensitive groups (children, asthma patients, elderly, pregnant woman, etc.)
- Encourage the development of citizen science initiatives on air quality through the dissemination of best practices among public authorities

²⁴ See <https://citimeasure.eu/>