



National Audit Office

Report

by the Comptroller
and Auditor General

**Environmental Audit Committee,
Environment, Food and Rural Affairs Committee,
Health Committee and Transport Committee**

Air quality

Key facts

Over 85%

proportion of air quality zones in the UK (37 of 43) that did not meet EU nitrogen dioxide limits in 2016

2026

government's estimate of when all 43 zones in the UK will be compliant with EU nitrogen dioxide limits

2010

original deadline for compliance with EU nitrogen dioxide limits

2021	Year by which government expects to achieve compliance with EU limits on NO ₂ in 37 of the UK's 43 air quality zones
31 Dec 2019	Date by which government expects five cities to have introduced new measures so that local air quality meets nitrogen dioxide limits in 2020
31 Dec 2018	Date by which government expects a further 23 local authorities to have completed plans for new measures to secure compliance with air quality limits as quickly as possible
Under review	Estimated mortality impact of nitrogen dioxide pollution
29,000	Estimated equivalent number of deaths caused by fine particulate matter in the UK in 2008
£20 billion	Royal College of Physician's estimate of cost of the health impacts of air pollution to the UK in 2016
80%	Estimated proportion of nitrogen oxides concentrations at the roadside due to road transport (national average)
13%	Proportion of all fine particulate matter emissions in the UK due to road transport
£2.5 billion	Potential spend between 2015 and 2020 on schemes with intended air quality benefits of which government's Joint Air Quality Unit directly oversees £0.3 billion
2018	Year in which government plans to publish a wider air quality strategy

Summary

Aim and scope

1 This briefing gives an overview of government's approach to improving air quality in the UK. It has been prepared in support of a joint inquiry by the Environmental Audit Committee, the Environment, Food and Rural Affairs Committee, the Health Committee and the Transport Committee of the House of Commons.

2 Air pollution is the presence or introduction of any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere, such as nitrogen dioxide and particulate matter. Improving air quality is a cross-government responsibility. It is a devolved matter, and the respective administrations are responsible for developing air quality policy in Northern Ireland, Wales and Scotland. For England, responsibilities include:

- the Department for Environment Food & Rural Affairs (Defra), for air quality policy and strategy;
- the Department for Transport (DfT), for policy measures to reduce air pollution from transport, such as schemes to promote cycling and walking, and to mitigate the effect of new road-building;
- the Department for Communities and Local Government (DCLG), for alignment with its approach to local growth, with its stewardship of the local government financial system, and with the national planning system;
- the Department for Business, Energy & Industrial Strategy (BEIS) for regulation of industrial pollution, alignment with government's industrial strategy and for alignment with its plans to tackle climate change;
- the Department of Health and Public Health England, for advice on the health impacts of air pollution;
- local authorities, which have had statutory air quality duties since 1995 including requirements to designate air quality problem areas as 'Air Quality Management Areas' and to develop action plans to resolve the problem; and
- the Mayor of London, who sets policies and leads on the implementation of air quality measures in the capital.

3 In this briefing we set out:

- **why air quality matters** (Part One), covering the causes and consequences of air pollution, EU air quality limits, and how the UK is performing compared with other EU member states;
- **the UK's plan for improving air quality** (Part Two), covering government's latest (July 2017) plan for tackling roadside concentrations of nitrogen dioxide, and the analysis and modelling that informed the 2017 Plan; and
- **risks and success factors for delivery of government's air quality plans** (Part Three).

4 This briefing is based on publicly available information, supplemented by interviews with Defra, DfT, DCLG and stakeholders, as well as a review of selected internal government documents (see Appendix Two).

Key points

Why air quality matters

5 Concentrations of pollutants in the air pose a risk to health and the environment. An expert Committee to the Department of Health has estimated that fine particulate matter (PM_{2.5}) increased mortality by the equivalent of 29,000 deaths in the UK in 2008. It considers that on the balance of evidence nitrogen dioxide presents an additional health risk, though it cautions that it is not yet possible to make a reliable quantitative estimate of the size of this effect. Public Health England reports that long-term exposure to poor air quality is a contributory factor to around as many deaths in England as alcohol. The Royal College of Physicians has estimated that the health impacts of air pollution cost the UK £20 billion in 2016 (paragraphs 1.2 to 1.5 and Figure 1).

6 This is despite emissions of pollutants from transport, industry and other sources having fallen in recent decades. UK emissions of nitrogen oxides (NO_x)¹ and fine particulate matter fell by 69% and 76% respectively from 1970 to 2015, with similar reductions in other pollutants. These reductions have been achieved through legislative restrictions on industry, European vehicle emission standards, and a shift in the UK fuel mix away from coal, among other measures (paragraph 1.7).

¹ The term nitrogen oxides covers nitrogen *di*-oxide (NO₂) and nitric oxide (NO). The latter can react in the atmosphere to produce secondary NO₂.

7 The UK has not yet met EU concentration limits for one pollutant (NO₂) that had a compliance deadline of 2010. For reporting purposes the UK is divided into 43 air quality zones. A zone is deemed to be non-compliant if the UK's official monitoring and modelling shows that concentrations of pollutants in the air at one or more locations within the zone exceed certain limits. In 2016, 37 of the UK's 43 air quality zones did not comply with annual limits for nitrogen dioxide concentrations. Meeting these limits has been a problem across Europe, and the European Commission has launched infringement cases against a number of Member States, including the UK, Germany, France and Spain. In February 2017, the European Commission took forward the second phase of its infringement case against the UK by issuing a 'Reasoned Opinion'. This required the UK to show how it will comply with legal limits as quickly as possible. If the Commission is not satisfied with the UK's response it could refer the matter to the Court of Justice of the European Union. Government considers that a key cause of non-compliance is the failure of European vehicle regulations (Euro standards) to deliver expected emissions reductions in real-world driving conditions (see paragraphs 1.10 and 1.11).

8 Road transport is the main contributor to non-compliance with nitrogen dioxide concentration limits, though wider air pollution problems arise from a range of sources. The concentration of air pollutants at any particular location is determined by a combination of regional and local factors. Road transport is the largest single source of nitrogen oxide (NO_x) emissions and is responsible for 80% of the NO_x concentrations at locations where the UK exceeds legal limits, on average. But it is not the most significant source of emissions of all air pollutants: wood and coal burning by households represents 42% of fine particulate matter emissions, while agriculture contributes 81% of ammonia emissions (paragraph 1.6).

9 The government has said that it remains committed to maintaining environmental protections after the UK exits the European Union. Under the current provisions of the European Union (Withdrawal) Bill, law derived from the EU would continue in domestic law after Exit Day. This includes air quality limits and ceilings. Current arrangements for enforcement of these legal duties will no longer apply if the UK is no longer in the jurisdiction of the Court of Justice of the European Union. UK courts will continue to have a role through the judicial review process, but it is not clear whether or how government will provide for equivalent arrangements for independent, regular review of progress and financial penalties for non-compliance. The Secretary of State for Defra has said that he recognises stakeholders' concerns about a 'governance gap' after EU exit, and that proposals to address this will be considered in the course of the progress of the Withdrawal Bill. On 12 November he announced plans to consult on a new, independent body to hold the government to account for upholding environmental standards in England after the UK leaves the European Union (see paragraphs 1.14 and 1.17).

The UK's plan for improving air quality

10 Government published its latest air quality plan in July 2017 following a series of legal challenges to previous plans. In November 2016, the High Court concluded that the government's 2015 air quality plan was not compliant with the relevant regulations. It found that the Secretary of State fell into error in fixing on a projected compliance date of 2020 (and 2025 for London) and adopted too optimistic a model for future emissions. It concluded that the Secretary of State should aim to achieve compliance by the soonest date possible, choosing a route which reduces exposure as quickly as possible. Government published a final revised air quality plan focused on roadside nitrogen dioxide concentrations at the end of July 2017 (the 2017 Plan) (paragraphs 1.15 and 2.2).

11 A key component of the 2017 Plan is an expectation that 28 local authorities will implement new air quality measures to achieve compliance 'in the shortest possible time'. As part of the 2017 Plan, government wants to accelerate local authority action on air quality. It has issued a direction to 23 English local authorities to develop new local air quality plans, and is offering associated support, guidance and funding. These local authorities must complete feasibility studies for new air quality measures as soon as possible, with initial plans at the latest by 31 March 2018 and with final plans by 31 December 2018 at the latest. Central government will test whether these plans secure compliance in the shortest possible time, including by comparing the plans against its estimate that the introduction of 'charging clean air zones' could secure compliance by 2021. A charging clean air zone involves charging certain types of vehicles to enter certain areas in order to discourage use of the most polluting vehicles. The 2017 Plan also expects that a further five cities will continue with their plans to introduce new measures to secure compliance in 2020. Government expects that measures in the 2017 plan will secure full compliance in 2026, with 37 of the UK's 43 air quality zones compliant by 2021 (paragraphs 2.2 to 2.5).

12 Government selected these local authorities based on the central scenario of a complex modelling process that is subject to substantial uncertainty. The number of local authorities directed to take additional action under the 2017 Plan is based on a central forecast of the areas that would not comply with NO₂ limits in 2021 without additional local action. This is estimated by a complex modelling process that draws on several subsidiary models and numerous datasets. There will be inherent uncertainty in any model of a complex issue like air quality and so it is important for policy makers to consider the range of likely scenarios as well as a central forecast. The complexity of the air quality modelling makes it difficult to quantify the uncertainty involved, but government recognises that it is substantial. In consultation with an expert panel, government analysts concluded that the uncertainty could be +/- 29%. This would mean that while the most likely scenario is that 25 zones would be non-compliant in 2021 without additional local action, the range of possible scenarios without additional local action is between 1 and 37 non-compliant zones. Government considers that this represents the extremes of what is possible and is developing analysis to better understand the likelihood within this range (paragraphs 2.8 to 2.12).

13 Government has committed to publish a wider air quality strategy in 2018, covering a broader range of pollutants and sources. The 2017 Plan focuses on transport because vehicles are responsible for most of the NO₂ concentrations at the roadside, where the UK exceeds legal limits. There are, however, other significant contributors to air pollution such as domestic wood-burning, agriculture, industry and fossil fuel power plants. Government will set out its approach to these wider sources of air pollution in 2018 (paragraphs 1.6 and 1.9).

Risks and success factors

14 The new expectations on local authorities come at a time when they are facing funding pressures. Since 2010 government has reduced funding for local authorities as part of its plan to address the fiscal deficit. Our 2014 report on *Financial sustainability of local authorities* highlighted that local authorities have worked hard to manage the reductions in government funding through a mixture of efficiency measures and service transformation.² Government needs to assure itself that local authorities have sufficient capacity and resource to manage the actions needed. To support local authorities, government has announced a £255 million implementation fund to 2020-21 for the 28 local authorities that it expects to accelerate action on air quality, and is offering associated support and guidance. It has also committed to establish an additional Clean Air Fund to which local authorities will be able to apply, the details of which have not yet been announced (paragraphs 3.14 to 3.17).

15 Local authorities will need support from a wide range of other organisations to resolve local air quality problems. Local air quality is a function of national as well as local factors, such as the tax incentives on drivers to purchase types of vehicles, the impact of decisions made by Highways England relating to the Strategic Road Network, and progress in establishing the infrastructure for electric vehicles. Local authority work on air quality is also complicated by the separation between tiers of local government: while district or city councils have responsibility for managing local air quality, transport is managed by county councils (see paragraphs 3.4 and 3.13).

² Comptroller and Auditor General, *Financial sustainability of local authorities*, Session 2014-15, HC 783, National Audit Office, November 2014, available at: www.nao.org.uk/report/financial-sustainability-of-local-authorities-2014/

16 Strong leadership and co-ordination within government is important for achieving substantial and sustained improvements in air quality across all pollutants.

In February 2016 Defra and DfT took the important step of establishing a joint air quality unit to oversee delivery of government's plan for tackling NO₂ compliance. This unit has an oversight Board with representation from across central government, and therefore provides a valuable forum to improve collaboration and co-ordination. However we consider that key improvements may be needed. The unit's Board does not include local authorities or the Local Government Association, despite the key role that local government is expected to play in improving air quality. Nor does the unit systematically oversee spend and progress on schemes run by other parts of government that include intended air quality benefits. These schemes represent over £2.2 billion of potential spend between 2015 and 2020 across more than 8 sets of initiatives to promote changes such as greater take-up of electric vehicles, and support for cycling and walking. This means that there is no clear single responsibility within government for knowing whether the initiatives form a coherent portfolio that delivers good value for money as a whole in relation to air quality. Defra and DfT told us that they agree that this is an important objective, but believe that the arrangements which they currently have in place should secure this (paragraphs 3.5 and 3.9 to 3.11).

Issues the Committees may wish to put to government

Why air quality matters

- How will EU exit affect government's approach to air quality: are ceilings, limits and priorities likely to change, how will limits be enforced?
- What will need to be in place before EU exit to secure a smooth transition for air quality legislation and standards?
- When will we have updated estimates of the adverse impacts of UK air quality?

The UK's plan for improving air quality

- How does the plan draw on lessons learnt from government's performance on tackling air pollution to date?
- What provisions have you made to reflect the significant uncertainty associated with air quality modelling?
- What are the main issues that you plan to address in the 2018 air quality strategy?

Risks and success factors

- How are you dealing with the risk that local authorities do not have sufficient resources and expertise to be able to meet air quality requirements effectively? What factors will determine the size and eligibility criteria for the new Clean Air Fund?
- How will you make sure that local authorities receive the right support and engagement from other parts of government?
- How can you strengthen arrangements for leadership, oversight and communication across government on air quality: what additional skills and capacity will the Joint Air Quality Unit need; should local authorities be better represented at a national strategic level; and how will you track overall progress on national as well as local air quality measures?