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Air Quality in the UK post-Brexit

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Key Findings

- Air quality regulation and policy in the UK is a complex mix arising from international obligations, residual EU law, UK-wide and devolved legislation.
- Progress has been made since the first Clean Air Act was introduced in the UK in 1956, but UK limit values for key pollutants such as nitrogen dioxide are still four times higher than the limits recommended by the World Health Organisation.
- There have been long-standing and persistent breaches of air quality targets, limit values and long-term objectives for key pollutants, including nitrogen dioxide (NO_2) and fine particulate matter ($PM_{2.5}$).
- UK Government action (and inaction) has been successfully challenged through a range of legal mechanisms, including infraction proceedings, judicial review and through the new powers granted to the Office for Environmental Protection and Environmental Standards Scotland.
- Following EU exit, there is significant potential for the UK to weaken action on air quality, as demonstrated by the gap in accountability left by the revocation of parts of the National Emissions Ceilings Regulations 2018 via the EU Law Revocation and Reform Act 2023.

Introduction and Context

Poor air quality is considered by the UK government to be *"the largest environmental risk to public health in the UK"*[1]. The Committee on the Medical Effects of Air Pollution estimated in 2018[2] that air pollution contributes to between 29,000 and 43,000 deaths each year in the UK. Removing all fine particulate air pollution is predicted to have a bigger impact on life expectancy in England and Wales than eliminating passive smoking or road traffic accidents.

Poor air quality results from various pollutants originating from diverse sources. Key pollutants include:

- Sulphur dioxide (SO_2): Arises from burning fuels with sulphur impurities, notably from fossil fuel combustion and waste incineration.
- Nitrogen oxides (NOx): Formed from nitrogen and oxygen combination during combustion processes, with road transport, power generation, and industrial activities as major sources.
- Particulate matter (PM): Comprises small solid and liquid particles of various chemicals, categorised into PM_{10} and $PM_{2.5}$ based on size. Sources include engine combustion, brake and tyre wear, as well as atmospheric reactions.
- Ozone (O_3): Produced by reactions between pollutants in sunlight, rather than directly emitted. It irritates eyes, nose, and lungs, impacting both human health and vegetation.
- Non-methane volatile organic compounds (NMVOCs) are emitted from various sources such as combustion, petrol, solvents, and household products. They react with sunlight to form ground-level ozone.
- Lead (Pb) and heavy metals like arsenic, cadmium, mercury, and nickel mainly come from fossil fuel combustion and industrial activities.
- Polycyclic Aromatic Hydrocarbons (PAHs), including Benzo[a]pyrene (BaP), are toxic compounds found in wood and coal burning, waste burning, coke and steel production.
- Benzene, used in industrial processes, evaporates quickly and is emitted from vehicle exhaust, petrol, and various industries.
- 1,3-Butadiene is emitted from fuel combustion, particularly from petrol and diesel vehicles.
- Carbon Monoxide (CO) forms from incomplete fuel combustion, primarily from road transport and residential and industrial activities.

[1] See: https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution
[2] See: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734799/COMEAP_NO2_Report.pdf

- Ammonia (NH_3) is emitted mainly from agriculture during manure and fertiliser handling, with additional sources from the waste sector and industry.

The sources of these pollutants are a range of natural and anthropogenic sources, including the combustion of fossil fuels for industrial and domestic processes, incineration of waste, emissions from traffic, chemical and photochemical reactions.

Although air pollution can be harmful to everyone, the UK government acknowledges that deprived communities and the most vulnerable in society are likely to be most impacted. Air pollution exacerbates health inequalities and there is clear evidence that people with a low income are more likely to be affected.

The economic cost from the impacts of air pollution in the UK was estimated at £157 million in 2017, with the latest findings from Public Health England warning that costs could reach as much as £18.6 billion by 2035 unless action is taken.[3]

Despite these compelling reasons for action, the UK government has repeatedly failed to put in place sufficient plans and programmes to ensure that air quality limit values, targets and long-term objectives are met for key pollutants. Successful challenges by the European Commission through infraction proceedings and through judicial review in the national courts have forced the UK to do more and to do it faster. Progress has been made since the first Clean Air Act was introduced in the UK in 1956, but UK limit values for key pollutants such as nitrogen dioxide are still four times higher than the limits recommended by the World Health Organisation.

UK legislation is primarily based on the requirements set out in international treaties, such as the Convention on Long-Range Transboundary Air Pollution and its Protocols; as well as in a broad range of EU legislation governing national emission ceilings, ambient air quality and emissions from industrial and other processes. Following EU exit, there is significant potential for the UK to weaken action on air quality, a possibility that has been formally recognised by Environmental Standards Scotland in its recent report on fine particulate matter.[4]

This paper gives an overview of the current patchwork of UK air quality policy and legislation.

[3] See: https://laqm.defra.gov.uk/air-quality/guidance/public-health/#:~:text=The%20economic%20cost%20from%20the,2035%20unless%20action%20is%20taken.
[4] See: https://environmentalstandards.scot/publications/particulate-matter-in-scotland-an-assessment-of-the-evidence-ambition-and-prospects/

International regulation of air quality

EU and UK policy and legislation on air quality are influenced by international law and guidelines, which set the basic limit values and requirements for a range of pollutants, as well as creating mechanisms for data collection, emissions monitoring and cooperation.

The main obligations are set out in the Convention on Long-Range Transboundary Air Pollution (CLRTAP, or the Air Convention) and its Protocols. CLRTAP was adopted in 1979 under the auspices of the United Nations Economic Commission for Europe (UNECE). The Convention entered into force in 1983, establishing a system allowing governments to work together with the aim of protecting human health and the environment from the effects of transboundary air pollution.

Eight Protocols have subsequently been adopted under the Convention setting legally binding limit values, technical standards and emissions ceilings for emissions of sulphur dioxide (SO_2), nitrogen oxides (NOx), volatile organic compounds (VOCs), heavy metals, persistent organic pollutants, ammonia (NH_3) and black carbon ($PM_{2.5}$).

In addition to the binding targets set out under CLRTAP and its Protocols, the World Health Organisation (WHO) Air Quality Guidelines provide global targets for national, regional and local governments to work towards improving citizen's health by reducing air pollution. These guidelines offer thresholds and limits for pollutants posing health risks, providing recommended levels and interim targets for particulate matter ($PM_{2.5}$ and PM_{10}), ozone (O_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and carbon monoxide (CO). Although not legally binding unless adopted by a country, the guidelines are intended to inform target setting.

The WHO guidelines were strengthened in 2021. Compared to the 2005 version, the new guidelines notably lower the annual limit for $PM_{2.5}$ – the air pollutant most harmful to human health – from 10 µg/m^3 to 5 µg/m^3 and the guideline level for NO_2 from 40 µg/m^3 to 10 µg/m^3. In 2022, statistics published by the Central Office of Public Interest and Imperial College London, based on modelling of UK government approved data suggested that 70% of UK addresses breach WHO limits for PM_{10}, $PM_{2.5}$ and NO_2, with 97% of UK addresses breaching at least one of the limit values.[5]

A number of other international agreements also have an indirect impact on the pollutants responsible for air pollution, as policies put in place to address climate change and biodiversity loss can also help to address air pollution. This includes the policies to implement the United Nations Framework Convention on Climate Change and the Paris Agreement; the Convention on Biological Diversity and its Kunming-Montreal Global Biodiversity Framework; and the Montreal Protocol on Ozone Depleting Substances; and voluntary mechanisms such as the Global Methane Initiative and the Climate and Clean Air Coalition.

It is also worth noting that the UK is a Party to the UNECE Kiev Protocol on Pollutant Release and Transfer Registers (PRTR), which aims to enhance public access to information through the establishment of coherent, nationwide PRTRs.

[5] See: https://www.theguardian.com/environment/2022/apr/28/dirty-air-affects-97-of-uk-homes-data-shows

Box 1: Revision to EU Air Quality Directives

In 2022, the European Commission proposed to revise its Ambient Air Quality Directives (Directives 2004/107/EC and 2008/50/EC).[6] Envisaged as part of a wider Zero Pollution Action Plan[7] the revision is designed to align EU air quality standards more closely to World Health Organisation recommendations and to put in place improved measures on access to justice, penalties, and monitoring.

At the time of writing, the revision is imminent after having received agreement by both main Institutions – the European Parliament and Council and expected to formally pass into law. However, this belies some controversy in its passage. The European Commission was under heavy pressure, particularly from NGO's, to fully align with WHO air quality standards. The Commission, however, concluded that significant additional costs and effort at a local level would be required to make this work effectively and instead opted to 'point towards a post 2030 perspective for a full alignment with the 2021 WHO Air Quality Guidelines'.

Nevertheless, the revision does envisage a reduction in limit values for key pollutants such as nitrogen dioxide from 40 µg/m^3 to 20 µg/m^3 (WHO recommendation is 10 µg/m^3) and for black carbon ($PM_{2.5}$) from 25 µg/m^3 to 10 µg/m^3 (WHO recommendation is 5 µg/m^3) as well as measures on governance and enforcement, on air quality assessments and on the requirement for public information to be made available about air quality.

If the revision to the EU air quality directives enters into force as is expected, this will open up a legal divergence with the UK.

[6] See: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A542%3AFIN
[7] See: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2021%3A400%3AFIN

Air Quality regulation in the UK

Regulatory landscape

UK air quality legislation incorporates international commitments, as described above, retained EU law, and domestic law. Emissions of key pollutants are regulated through a combination of national and devolved legislation.

The Environment Act 1995 required the publication of an Air Quality Strategy to set out air quality standards, objectives and measures for improving ambient air quality. Each UK nation has its own strategy:

- In England, the Air Quality Strategy 2023[8]
- In Northern Ireland, a public discussion document[9] was published in 2020 to replace the 2007 UK-wide strategy[10] as it applies to Northern Ireland
- In Scotland, Cleaner Air for Scotland 2 – Towards a Better Place for Everyone[11]
- In Wales, the 2021 Clean Air Plan for Wales[12]

The Environment Act 1995 also established the Local Air Quality Management (LAQM) regime, requiring local authorities to review and assess air quality, designate Air Quality Management Areas (AQMAs), and develop action plans if standards were not met.

In February 2022, the UK Government published the Air Quality Common Framework,[13] which set out how the UK Government and the Devolved Administrations intended to work together to develop air quality policy following the UK's exit from the EU.

[8] Defra, April 2023. See: https://www.gov.uk/government/publications/the-air-quality-strategy-for-england https://assets.publishing.service.gov.uk/media/5a79b5f3ed915d07d35b789c/pb12670-air-quality-strategy-vol2-070712.pdf
[9] See: https://www.daera-ni.gov.uk/clean_air_strategy_discussion_document
[10] See: https://assets.publishing.service.gov.uk/media/5a758459ed915d731495a940/pb12654-air-quality-strategy-vol1-070712.pdf and
[11] Scottish Government, 2021. See: https://www.gov.scot/publications/cleaner-air-scotland-2-towards-better-place-everyone/. A review of progress is scheduled for 2024.
[12] An update on progress was published in 2023. See: https://www.gov.wales/clean-air-plan-wales-healthy-air-healthy-wales.
[13] See: https://assets.publishing.service.gov.uk/media/61fa845ad3bf7f78e6c6f243/air-quality-provisional-common-framework.pdf

Similar to the EU, the UK's air quality standards are organised into three main categories:

1. Standards for **transboundary air pollutants**, such as sulphur oxides, nitrogen oxides, ammonia, volatile organic compounds, and particulate matter.
2. **Ambient air quality standards**, which include limits for pollutants like ground-level ozone, particulate matter, nitrogen oxides, and heavy metals.
3. **Standards for key pollution sources**, initially established at the EU level. These standards target emissions from industrial activities, power plants, vehicles, transport fuels, and product energy performance.

1. Transboundary Air Pollutants

The National Emissions Ceiling Regulations 2018[14] were the primary mechanism for implementing the EU National Emissions Ceiling Directive, and consequently the UNECE Gothenburg Protocol. The Regulations remain in force and set UK wide emission limits or 'ceilings' for sulphur dioxide (SO_2), nitrogen oxides (NO_x), ammonia (NH_3) and non-methane volatile organic compounds (NMVOC) for the years 2010, 2020 and 2030 and for fine particulate matter ($PM_{2.5}$) for the years 2020 and 2030.

The UK Government and devolved administrations published a Revised UK National Air Pollution Control Programme (NAPCP)[15] in February 2023 setting out the individual measures that will be taken in each nation to meet the national emissions ceilings legislation requirements. The NAPCP sets out measures and analysis for meeting the emission reduction commitments. The requirement on the UK Government to produce and update this document, which originally stemmed from EU law, has been removed by the EU Law Revocation and Reform Act 2023, removing a key element of accountability and transparency in relation to air quality.

2. Ambient Air Quality Standards

Responsibility for meeting air quality limit values is devolved to the administrations in Scotland, Wales and Northern Ireland, with the UK Department for Environment, Food and Rural Affairs (Defra) retaining responsibility for coordinating assessment and air quality plans for the UK as a whole.

Concentrations of key air pollutants in outdoor air are regulated by:

- The Air Quality Standards Regulations 2010[16] (England)

[14] SI 2018/129
[15] Defra, February 2023. See: https://assets.publishing.service.gov.uk/media/63e508428fa8f50509bdd926/Revised_National_Air_Pollution_Control_Programme__NAPCP_.pdf
[16] SI 2010/1001, as amended.

- The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[17]
- The Air Quality Standards Regulations (Northern Ireland) 2010[18]
- The Air Quality Standards (Scotland) Regulations 2010[19] and
- The Air Quality Standards (Wales) Regulations 2010[20]

These regulations set legally binding limits for concentrations in outdoor air of major air pollutants that particularly impact human health, namely sulphur dioxide, nitrogen oxides, particulate matter (PM_{10} and $PM_{2.5}$), lead, benzene, carbon monoxide and ozone. The regulations also include targets for levels in outdoor air for cadmium, arsenic, nickel and mercury as well as for polycyclic aromatic hydrocarbons (PAH).

The regulations refer to 'limit values', which are legally binding, 'target values' and 'long-term objectives', which the government must take all measures to meet whilst not entailing disproportionate costs.

The UK Government's Compliance Assessment Summary of Air Pollution in the UK 2022[21] (the latest year for which data is available) showed that:

- Hourly limit values were met across the UK for NO_2, with nine zones (all in England) exceeding annual mean limit values,[22]
- Daily mean concentrations for and annual mean concentrations of PM_{10} were met across the UK,
- All limit values for $PM_{2.5}$ were met across the UK,
- All areas across the UK met the target values for ozone but nowhere met the long-term objective for ozone,
- All limit values for SO_2, CO, benzene and lead were met across the UK, as were the target values for arsenic and cadmium,
- Three areas exceeded the target value for nickel (two in England and one in Wales); and
- Two areas exceeded the target value for benzo[a]pyrene (both in Wales).

[17] SI 2023/96. This regulation was introduced under the Environment Act 2021, which required the UK to set a legally mandatory target for $PM_{2.5}$ for England. Interim targets are set out in the 2023 Environmental Improvement Plan.
[18] SR 2010/188, as amended.
[19] SSI 2010/204, as amended.
[20] SI 2010/1433 (W. 126)
[21] Defra, September 2023. See: https://uk-air.defra.gov.uk/library/annualreport/assets/documents/annualreport/air_pollution_uk_2022_Compliance_Assessment_Summary_Issue1.pdf
[22] The UK is divided into 43 zones for air quality assessment. There are 28 agglomeration zones (large urban areas) and 15 non-agglomeration zones.

3. Standards for Key Pollution Sources

Industrial emissions

Legislation is also in place across the UK to regulate emissions from specific sources. This includes:

- The Environmental Permitting Regulations (England and Wales) 2016[23]
- The Pollution Prevention and Control (Scotland) Regulations 2012, as amended 2017[24]
- The Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013, as amended 2018[25]

These regulations set standards and provisions to reduce emissions of pollutants from a range of industrial sources – from intensive pig and poultry farms through to chemical manufacturing sites and power stations. The main mechanism for controlling emissions is through compliance with an industrial installations permit. Industrial installations must use best available techniques (BAT) to reduce their emissions.

Domestic use of solid and fossil fuels

In addition, the UK Government has introduced the Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020,[26] which restrict the sale of wet wood and emissions from solid fuels, including a phase-out of traditional house coal. Similar controls on the sale of wood and phase-out of coal are yet to be introduced in the devolved administrations.

Provisions included in the Environment Act 2021 should help to streamline the enforcement of offences relating to solid fuels in smoke control areas by introducing a civil penalty regime to replace the previous criminal offences, through amendments to the Clean Air Act 1993. A similar civil penalty regime for smoke control areas was introduced in Wales via the Environment (Air Quality and Soundscapes) (Wales) Act 2024.

NO_2 and transport emissions

Road vehicles are sources of air pollutants such as particulate matter and nitrogen dioxide (NO_2). The UK Government has issued several plans to reduce NO_2 levels due to zones not meeting EU limits. The most recent, and still current, plan is the "*UK plan for tackling roadside nitrogen dioxide concentrations: Detailed plan", July 2017*.[27] Mechanisms to reduce transport emissions include the introduction of road user charging zones have been put in place in some parts of the UK, such as London's low emission zone

[23] SI 2016/1154
[24] SSI 2012/360
[25] SR 2013/160
[26] SI 2020/1095
[27] https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017

(LEZ) and ultra-low emission zone (ULEZ), England's clean air zones (CAZ) and Scotland's low emission zones (LEZ).

These zones are intended to reduce air pollution in cities by charging drivers of older, more polluting vehicles to enter them, with rules set on the basis of the Euro emission engine classification standards. Since 2017, the Government has used its powers under the Environment Act 1995 to 'direct' many local authorities to produce clean air plans. Local authorities can then charge drivers using powers granted by the Transport Act 2000. A key difference between the zones in England and Scotland is that in England, road users can pay to enter, with failure to do so attracting financial penalties; whereas in Scotland vehicles that do not meet the standard are prohibited from entry within the zone, again with financial penalties for failure to comply.

Box 2: The role of local authorities in England in tackling air pollution

Local authorities in England play a huge role in reviewing, measuring and assessing air quality, understanding the impacts and changes over time and ultimately putting in place actions to improve the quality of air that we breathe. Local Authority responsibilities across Wales, Scotland and Northern Ireland are broadly similar to those in England.

Where local authorities find that objectives are not met or are likely to be met an AQMA must be declared, following which an LAQM is established to tackle and improve air quality in that area within a specified time frame. In London, responsibility for air quality has been devolved to the Mayor of London and follows separate LAQM guidance. All local authorities, however, have a responsibility to proactively improve air quality whether or not there is an AQMA in place. This is undertaken through the local authority's Air Quality Strategy (AQS), which details matters including how monitoring, assessment and enforcement are carried out.

Local authorities have a responsibility to tackle pollution from a variety of sources, including traffic and transport, domestic fuel burning, industrial emissions and agriculture. Local authorities also have a significant role to play in making planning decisions and can use this power to influence the siting of installations and mitigation measures needed to protect local people from air pollution.

Compliance and Enforcement

Infraction proceedings

In February 2014 the European Commission began infraction proceedings against the UK for its failure to meet Air Quality Directive targets for NO_2 in 16 of its air quality zones.[28] This action was followed in February 2017 by final warnings to Germany, France, Spain, Italy and the United Kingdom for failing to address repeated breaches of NO_2 limits.[29]

In 2018 an Air Quality Ministerial Summit was convened by Commissioner Vella, as a final effort to find solutions to address the serious problem of air pollution in these countries. The Commission concluded the Member States in question, *"did not present credible, effective and timely measures to reduce pollution, within the agreed limits and as soon as possible, as required under EU law"*.[30] The Commission therefore decided to proceed with legal action. On 17 May 2018 the Commission referred the UK (along with France, Germany, Hungary, Italy and Romania) to the Court of Justice of the EU (CJEU) for *"for failure to respect limit values for nitrogen dioxide (NO_2), and for failing to take appropriate measures to keep exceedance periods as short as possible"*.[31]

In 2021, the CJEU ruled that the UK had 'systematically and persistently' exceeded legal limits for NO_2 since 2010 and had failed in its legal duties to put plans in place to tackle the problem in the shortest possible time.[32]

Post-Brexit enforcement of air quality legislation

Recent enforcement proceedings against the UK Government regarding air quality non-compliance have arisen from both European Commission infringement proceedings and judicial review in UK courts. With the UK's departure from the EU, the enforcement role previously undertaken by the European Commission will fall to the Office for Environmental Protection (OEP) in England and Northern Ireland and to Environmental Standards Scotland (ESS).[33]

To date, the OEP has published a 2023 Air Quality Stocktake,[34] along with monitoring reports, such as the 2023 report on the Government's delivery of its 25-year plan to improve the environment.[35] The OEP holds

[28] European Commission, Press release, Environment: Commission takes action against UK for persistent air pollution problems, Brussels, 20 February 2014
[29] European Commission - Press release, Air Quality: Commission warns Germany, France, Spain, Italy and the United Kingdom of continued air pollution breaches, Brussels, 15 February 2017
[30] European Commission press release, Air quality: Commission takes action to protect citizens from air pollution, Brussels 17 May 2018
[31] Ibid
[32] Case C-664/18 Commission v. UK: See https://curia.europa.eu/juris/document/document.jsf?text=&docid=238474&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=3502431
[33] Interim arrangements have been put in place in Wales pending the establishment of a permanent environmental governance body for Wales.
[34] https://www.theoep.org.uk/sites/default/files/reports-files/Air%20Quality%20Stocktake%20technical%20report.pdf
[35] Progress in improving the natural environment in England, 2021/2022. See: https://www.theoep.org.uk/report/progress-improving-natural-environment-england-20212022

enforcement powers, issuing information notices and decision notices, and can initiate legal proceedings in the High Court through environmental review procedures. Although damages are not available as a remedy, failure to comply with court orders may result in contempt charges. Concerns have been raised about whether the OEP's powers are comparable to the infraction and infringement related powers of the European Commission.

ESS Investigations into air quality

In 2022, Environmental Standards Scotland (ESS) conducted an investigation on the Scottish Government's plans for compliance with legal limits on NO_2 and identified areas for improvement, particularly in relation to management of local air quality. Specific areas for improvement included the timeframes of which local air quality objectives should be met and the rules around these objectives. ESS also considered that the existing oversight and governance arrangements were overly complex and opaque.

ESS recommended measures to strengthen air quality systems, including setting target dates for publishing and achieving air quality action plans by local authorities. In addition, ESS recommended that the Scottish Government should identify or introduce an appropriate monitoring body; make improvements to monitoring systems; and revise its air quality strategy to include specific and measurable timescales for achieving compliance. The Scottish Government responded in March 2023, accepting all recommendations and committing to action.

In February 2024, ESS released additional findings on air quality in its report, *Particulate matter in Scotland, an assessment of the evidence, ambition and prospects*.[36] The report was prepared following the publication of the WHOs revised guidance in 2021 and its advice that more stringent limits should be introduced for $PM_{2.5}$. The report found that progress in addressing air pollution in Scotland has stalled with scope for significant improvement in relation to emissions from industrial processes, industrial combustion, residential and other combustion and from agriculture. The report also found that the revocation of parts of the National Emissions Ceilings Regulations 2018 by the UK Government through the EU Law Revocation and Reform Act 2023 has left a gap in accountability.

[36] See: https://environmentalstandards.scot/publications/particulate-matter-in-scotland-an-assessment-of-the-evidence-ambition-and-prospects/

Judicial Review

Environmental advocacy charity, ClientEarth, brought judicial review proceedings against the UK government in 2015 in relation to the government's admitted and continuing failure to meet nitrogen dioxide (NO_2) limits set by the EU Air Quality Directive 2008.[37] In its ruling on 29 April 2015, the Supreme Court unanimously ordered the government to submit new air quality plans to the European Commission no later than 31 December 2015.

The new plan was successfully judicially reviewed by ClientEarth in 2016[38] on the basis that the government had breached its legal duty to produce new air quality plans to bring air pollution down to legal levels in the 'shortest possible time'.

The Government published a revised plan in July 2017, which was again successfully judicially reviewed. The plan was deemed not to be sufficient as it did not *"contain measures sufficient to ensure substantive compliance with the 2008 Directive and the English regulations"*.[39] In response, the UK Government has directed more than 60 local authorities to produce local plans to tackle NO_2 levels within their areas. This process was further delayed by the Covid-19 pandemic, with plans still outstanding in a number of areas and implementation of clean air zones still to fully take place.

[37] R (on the application of ClientEarth) (Appellant) v Secretary of State for the Environment, Food and Rural Affairs (Respondent) [2015]
[38] ClientEarth No.2 v Secretary of State of Environment, Food and Rural Affairs, [2016]
[39] ClientEarth No.3, R (on the application of) v Secretary of State for Environment, Food and Rural Affairs & Ors [2018]

Glossary

- **AAQD** – Ambient Air Quality Directives (2204/107/EC & 2008/50/EC)
- **AQMA** – Air Quality Management Area
- **AQS** – Air Quality Strategy
- **BaP** – Benzo[a]pyrene
- **BAT** – Best Available Technique
- **CAZ** – Clean Air Zone
- **CJEU** – Court of Justice of the EU
- **CLRTAP** – Convention on Long-Range Transboundary Air Pollution
- **CO** – Carbon Monoxide
- **CO_2** – Carbon Dioxide
- **DEFRA** – Department for Environment, Food and Rural Affairs
- **EMEP** – Emissions of Air Pollutants in Europe
- **ESS** – Environmental Standards Scotland
- **LA** – Local Authority
- **LAQM** – Local Air Quality Management
- **LEZ** – Low Emission Zone
- **NAPCP** – National Air Pollution Control Programme
- **NH_3** – Ammonia
- **NMVOCs** – Non-methane volatile organic compounds
- **NO_x** – Nitrogen Oxide
- **NO_2** – Nitrogen Dioxide
- **O_3** – Ozone
- **OEP** – Office for Environmental Protection
- **PAHs** – Polycyclic Aromatic Hydrocarbons
- **Pb** – Lead
- **PM** – Fine solid and liquid particulate matter of various chemicals
- **$PM_{2.5}$** – Fine solid and liquid particulate matter with aerodynamic diameters of less than or equal to 2.5µm
- **PM_{10}** – Fine particulate matter with aerodynamic diameters of less than or equal to 10µm
- **PRTR** – Pollutant Release and Transfer Register
- **SO_2** – Sulphur Dioxide
- **ULEZ** – Ultra-Low Emission Zone
- **UNECE** – United Nations Economic Commission for Europe
- **VOCs** – Volatile Organic Compounds
- **WHO** – World Health Organisation

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