REPORT

Institute for European Environmental Policy UK

AIR QUALITY POLICY IN THE UK AND EU

STATE OF PLAY

Mapping UK-EU Policy Divergence

December 2025

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About us

The **Institute for European Environmental Policy UK (IEEP UK)** is a sustainability think tank with over 40 years of experience. As part of the broader IEEP family, we are committed to advancing evidence-based research, analysis and policy insights in the UK and its interaction with policy in the EU and globally.

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The places that we grow up, live and work impact how healthy we are. Urban areas, like inner-city London, have some of the most extreme health outcomes. Alongside their vibrancy and diversity sit stark health inequalities.

At Impact on Urban Health, we want to change this. We believe that we can remove obstacles to good health, by making urban areas healthier places for everyone to live.

The London Boroughs of Lambeth and Southwark are our home. They are some of the most diverse areas in the world. It is here that we invest, test, and build our understanding of how cities can be shaped to support better health. We're focused on a few complex health issues that disproportionately impact people living in cities, and we work with local, national and international organisations, groups and individuals to tackle these.

Our place is like so many others. So we share our insight, evidence and practical learning to improve health in cities around the world.

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EXECUTIVE SUMMARY

Progress has been made on air quality in the UK and across Europe in recent decades. However, data on the number of premature deaths linked to air pollution are a sobering reminder of the seriousness of poor air quality and the need to continue to demand stricter emission limits or tighter standards to reduce air pollution further.

Since the UK left the EU, policy on air quality has undergone divergence in some areas. This report presents an overview of major legislative and strategic developments in UK and EU policy across air quality, climate, transport, energy, industrial, and land, agricultural and nature domains. Post-Brexit, the UK and its devolved nations have the potential to match or exceed EU regulations on air quality, but overall this opportunity has not yet been realised.

The EU's revised **Ambient Air Quality Directive (AAQD)**[1] entered into force on 10 December 2024, merging the two former EU Ambient Air Quality Directives into a single directive. It sets an objective for zero pollution to air by 2050 and introduces a range of stricter air quality standards and limit values, bringing them more closely (but for several pollutants not fully) into line with World Health Organization (WHO) guidelines. It also puts in place new measures on access to justice, damage redress, penalties, better public information on air quality, and new monitoring rules, modelling and requirements for air quality plans.

The equivalent legislation in the UK is the **UK Air Quality Standards Regulations 2010**, which implement the former EU Air Quality Directives. The Regulations apply mainly in England, although the provisions on fine particulate matter ($PM_{2.5}$) and transboundary pollution also apply to the devolved administrations.

Both the UK and EU are world leading in their target-setting ambition to tackle climate change and have put in place various measures to help them reach these goals. Climate change regulations can bring co-benefits for air pollution.

Transport – More efficient engines and fewer cars using internal combustion engines on our roads are helping to reduce pollutants damaging for people's health. Tackling emissions at source by amending product standards (like removing lead from petrol) has had a large impact on air quality. Clean Air Zones and tiered Vehicle Excise Duty based on emissions proxies have helped to shift road use and influence vehicle purchase decisions to help reduce air pollution from road vehicles. However, non-exhaust emissions remain a growing problem. Regulations on marine and aviation transport also have a role to play in improving air quality as well as meeting climate change commitments.

Energy - UK demand for electricity is set to double by 2050. Alongside the growth in deployment of renewable technologies (wind, solar, hydroelectric etc.), the Government will

1 *European Union (2024). Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202402881*

be relying on gas- and biomass-fired power stations along with carbon capture storage (CCS) technology. The reliance on these non-renewable forms of energy is likely to have an impact on the quality of our air, as their combustion releases particulate matter, NO_2, SO_2, VOCs and CO. Greater energy efficiency and improving the energy performance of buildings therefore, as well as a shift towards more renewable technologies more generally, can have a large co-benefit towards air quality.

Industry – Emissions from large industrial facilities are a key source of NO_x, SO_2, VOCs and PM and though the UK and EU have been successful in tackling emissions from the most polluting industries, the role of offshoring of heavy industries to other parts of the world over several decades is a factor too. The EU has recently revised its main legislation in this area however and attempted to tackle the growing share of NH_3 emissions by capturing more intensive livestock farms within its scope. The UK has not followed suit but is currently consulting on changes to regulations linked to the previous Industrial Emissions Directive. Product standards legislation related to solid fuels and solvents have had positive implications for air quality, although domestic burning remains an issue due to particulate matter pollution..

Land, agriculture and nature – Changes in land use, for example through deforestation or afforestation, the draining or wetting of peatlands, or the growing of crops for biofuels, can all affect air quality. Emissions to air can also be affected by changes to levels and types of food production. UK policy including the Climate Change Act 2008, the Net Zero Growth Plan and the National Planning Policy Framework have helped shape air quality impacts through these sectors.

Indoor air - Air quality policy has historically focused on outdoor ambient air quality. However, more recently, attention has been drawn to indoor air quality. Currently, UK legislation pertaining to indoor air quality is largely restricted to workplaces.

The UK had a role in driving the EU's air quality laws when it was an EU Member State. Each of the four nations of the UK now have to decide whether they wish to build on that legacy and reduce further the damage caused by poor air quality. Aligning with the new standards in the EU provides an initial benchmark for this ambition towards those targets set by the WHO. However, the UK has the opportunity to go even further with its ambitions than the EU, becoming a world leader in policy for cleaner air.

INTRODUCTION

Overall air quality in Europe has been improving over the last several decades. In part, this is down to an ever-tightening series of policies put in place by governments that have been designed to limit the risk from air pollution to people and the environment more generally. The risk of harm from acid rain or leaded petrol is perhaps a distant memory now, but these examples underline how air quality policies can make a positive difference to people's lives and the place they live.

Yet, despite the improvements, our understanding of the dangers of air pollution have evolved, and so too perhaps have our expectations of acceptable risk to people and the environment.

There are now numerous studies linking air pollution to chronic disease as well as other cardiovascular and respiratory illnesses.[2, 3] The statistics on the number of premature deaths linked to air pollution are a sobering reminder of the seriousness of poor air quality and the need to continue to demand stricter emission limits or tighter standards to reduce air pollution further. We are also learning more about the disproportionate impact of air pollution on different sections of our society and on the environment.[4] And though citizens in urban areas are affected the most, the sources of air pollution can emanate from semi-urban and rural activities too, with pollutants travelling significant distances to affect urban and rural residents alike.

In Europe, the European Union has helped to drive the process towards ever tighter air quality policies. For example, it has set new and challenging process, product and procedural standards, emission limits and emission 'ceilings'. For several decades, the United Kingdom actively helped to design and pass those rules and standards into law, laws which the UK was obligated to implement and enforce. Having left the European Union, the UK has the opportunity to go further and faster, to seek further reductions in air pollution that is harmful to the health of our citizens and to the environment. However, while EU has already taken several steps to do just that in the time since Brexit, the UK as a whole has not.

It is now up to lawmakers in each of the four nations of the UK to decide which policy levers they wish to pull in order to make further progress in reducing air pollution.

This report is designed to provide a 'state of play' comparative assessment of EU/UK (England) air quality policy, to identify those areas where alignment with the EU would mean better UK standards and provide a useful milestone towards achieving WHO limits. Building upon some of IEEP UK's recent work in this area,[5] it examines developments around air quality legislation

2 *Abed Al Ahad M, Demšar U, Sullivan F, et al. (2024). Long term exposure to ambient air pollution and hospital admission burden in Scotland: 16-year prospective population cohort study. BMJ Open 2024;14:e084032.* https://bmjopen.bmj.com/content/14/12/e084032

3 *Franklin, B.A., Brook, R., Pope, C.A. (2015) Air Pollution and Cardiovascular Disease. Current Problems in Cardiology, 40:5, pp205-238. ISSN 0146-2806.* https://doi.org/10.1016/j.cpcardiol.2015.01.003

4 *Impact on Urban Health (N.D.) Health Effects of Air Pollution.* https://urbanhealth.org.uk/our-work/health-effects-of-air-pollution

5 *Hamilton, C., Nicholson, M. (2024) Briefing: Air Quality Policy in the UK Post-Brexit. IEEP UK.* https://ieep.uk/publications/briefing-air-quality-policy-in-the-uk-post-brexit/

as well as those areas of policy which interact and intersect with it, such as climate, transport, energy, industrial pollution control and land, agriculture and nature protection legislation. A follow-up report will examine a number of individual case studies from around Europe where developments have demonstrated a positive impact on air quality, particularly in urban areas, and where the UK might draw inspiration for more ambitious policies. This report focuses mainly on England, and not on the policies and development in legislation across each of the nations of the UK.

RECENT DEVELOPMENTS IN UK AND EU POLICY

This chapter outlines a range of EU policy and legislative developments since the UK left the EU, together with the nearest equivalent policy or legislation in England. Since there are many measures with relevance to air quality, it is not possible to go into depth on all of them. The chapter therefore focuses first on two of the main measures specific to air quality – the new Ambient Air Quality Directive (AAQD), and the National Emissions Ceiling (NEC) Directive – outlining the key changes from the previous iterations of these directives. It then moves on to give an overview of other developments in several areas of policy with an impact on air quality – climate, transport, energy, and land, agriculture and nature – with a focus on the key objectives and targets (where they exist) to give a fuller picture of the landscape of EU policy and legislation of relevance to air quality.

Implementing air quality legislation

Putting in place laws designed to reduce air pollution and setting ambitious air quality standards is a fine principle, but actually achieving the targets set out in those laws and meeting those standards presents challenges. It requires robust leadership and governance, effective monitoring and enforcement, and adequate funding to make the necessary changes too.

The high number of open infringement cases brought by the European Commission against the EU's Member States related to air quality indicate that implementing existing law is already challenging for the Member States. It would also appear to suggest that meeting new requirements set out in revised laws such as the 2024 Ambient Air Quality Directive will be just as challenging too.

In the UK, the death of a nine-year-old girl directly attributed to air pollution[6] and a long-running case brought by the European Commission against the UK that was only recently closed[7] also indicate challenges with implementing the law. In Scotland, Environmental Standards Scotland (ESS) decided to follow up on the latter case by instigating an investigation into the Scottish Government's role in this judgement and nudging the Government towards making further changes.[8]

Local authorities and mayoral authorities are a key component of monitoring and enforcing rules 'on the ground' (such as managing clean air zones, smoke control areas, issuing permits for small industrial sites). With many competing demands on their resources, local authorities and mayoral authorities are under pressure to make the necessary changes which will contribute to national targets and objectives.[9]

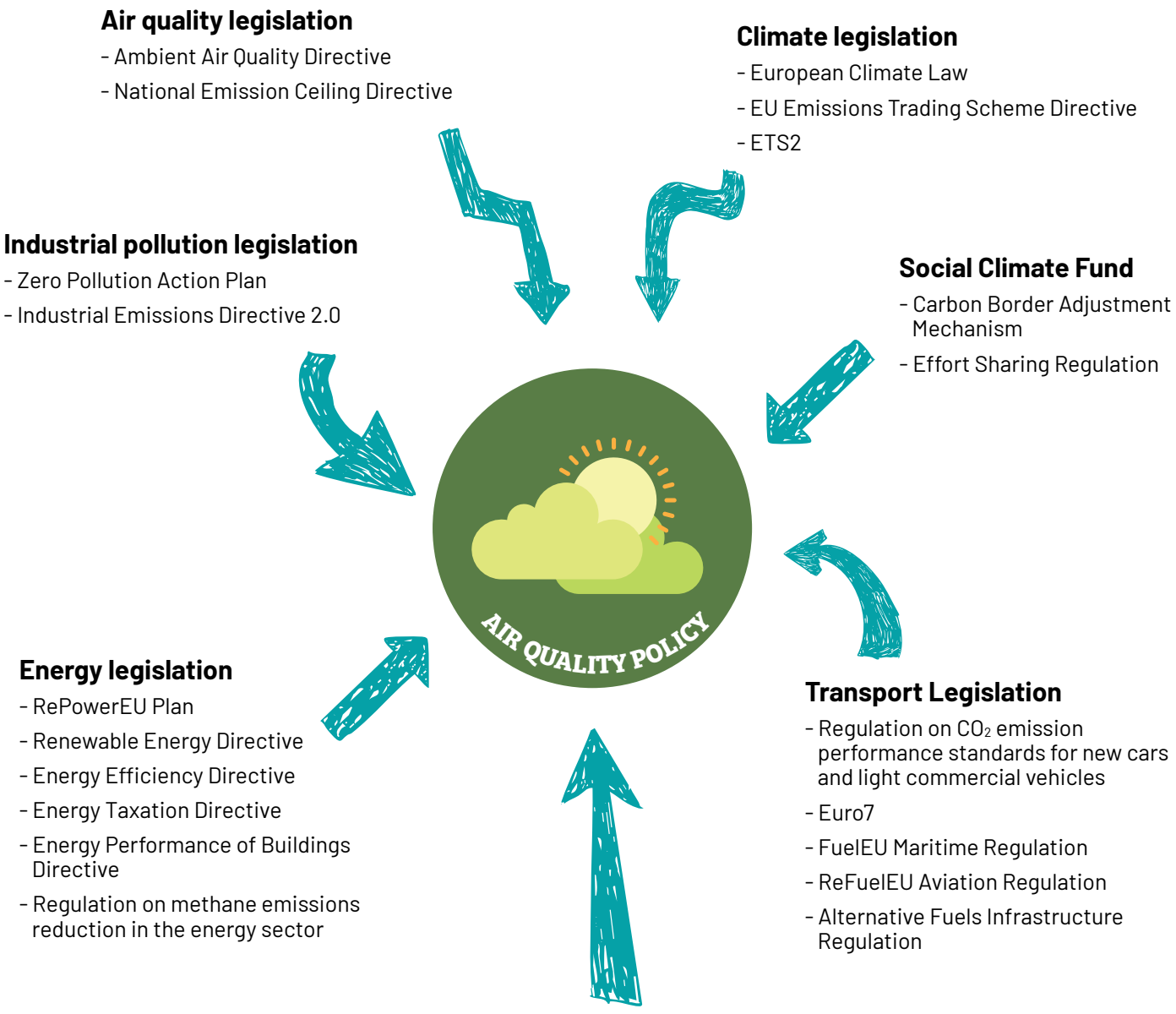
6 *BBC News (16th December 2020) Ella Alloo-Kissi-Debrah – Air Pollution a Factor in Girl's Death, Inquest Finds.* https://www.bbc.co.uk/news/uk-england-london-55330945

7 *In 2024, the Court of Justice of the European Union closed a long running case against the UK, opened in 2014 and confirmed in a judgement from 2021, for breaching nitrogen dioxide limits set by the (2008) Ambient Air Quality Directive when it was a member of the bloc. The case related to the fact that the UK had not sufficiently complied with the law in reducing pollution in 16 towns and cities across the UK from (mostly) road traffic. It is important to note though the EU dropped the case, not likely as a result of the UK complying with the law but for political expediency, resource pressures at the European Commission and the fact that the UK is no longer a member of the EU.*

8 *Environmental Standards Scotland (2022). Air Quality Investigation – Summary Report.* https://environmentalstandards.scot/our-work/our-investigation-reports/air-quality-summary-report/

9 *National Audit Office (2022) Tackling Local Breaches of Air Quality.* https://www.nao.org.uk/wp-content/uploads/2022/01/Tackling-local-breaches-of-air-quality-Summary.pdf

There are currently 72 open infringement cases relating to air quality out of a total of 318 environmental cases in total (air, chemicals, nature, waste, water etc), and 1,521 cases overall. Air quality cases (72) are second only to waste-related (79) infringements in the total number of environmental cases. This highlights that enforcement of air quality regulations is a salient issue.



AIR QUALITY LEGISLATION

Ambient air quality legislation

The EU's revised **Ambient Air Quality Directive (AAQD)**[10] entered into force on 10 December 2024, merging the two former EU Ambient Air Quality Directives into a single directive. It sets an objective for zero pollution to air by 2050 and introduces a range of stricter air quality standards and limit values, bringing them more closely (but for several pollutants not fully) into line with World Health Organization (WHO) guidelines. It also puts in place new measures on access to justice, damage redress, penalties, better public information on air quality, and new monitoring rules, modelling and requirements for air quality plans.

Access to Justice

The AAQD includes explicit provision for access to justice, giving citizens and civil society a clear right to go to court to demand better from authorities who fail to protect them from illegal levels of air pollution. Further, the Directive seeks to enforce accountability by creating financial implications if Member States fail to comply with air quality standards on time. This includes compensation for people whose health has been damaged by breaches of the new rules.

The equivalent legislation in the UK is the UK Air Quality Standards Regulations 2010, which implement the former EU Air Quality Directives. The Regulations apply mainly in England, although the provisions on fine particulate matter ($PM_{2.5}$) and transboundary pollution also apply to the devolved administrations.

10 *European Union (2024) Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast).* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202402881

Table 1 provides a summary of key measures/elements in the former directives and the new AAQD, together with the UK Air Quality Standards Regulations 2010.

Table 1 Key Measures of the AAQD, Compared with Former Directives and the UK Air Quality Standards Regulations 2010

Measure/ element	Former Air Quality Directives (2004/107/EC[11] and 2008/50/EC[12])	New Ambient Air Quality Directive ((EU) 2024/2881[13])	UK Air Quality Standards Regulations 2010[14]
Air quality standards *(see also Table 2 for specific values/targets)*	Set binding limit values for pollutants ($PM_{2.5}$, PM_{10}, NO_2, SO_2, O_3, CO, benzene, BaP, heavy metals) with certain exemptions and time extensions	Halves the $PM_{2.5}$ annual limit, reduces limit values for 12 pollutants, brings limits (broadly) closer to WHO guidelines, and introduces mandatory 5-year reviews beginning by 2030. MS must monitor progress to 2030 standards and take measures to ensure compliance	Sets limit values and target values for pollutants
Access to justice	No explicit mention of citizens' access to courts for air-quality breaches	Introduces explicit legal standing for individuals and NGOs to challenge non-compliance	No standalone legal right to judicial review or legal remedy for breaches of air quality limits
Right to compensation	No provisions on damages or compensation for health impacts	Grants the right to compensation for individuals suffering health damage due to violation of air quality rules, and supports NGO representation	No provision for compensation
Damage redress	No mechanism for redress or remedial action where damages arise	Explicitly requires Member States to ensure redress for environmental and health harms from air pollution violations	No mechanism for redress

11 *European Union (2004). Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.* https://eur-lex.europa.eu/eli/dir/2004/107/oj/eng

12 *European Union (2008). Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.* https://eur-lex.europa.eu/eli/dir/2008/50/oj/eng

13 *European Union (2024). Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast).* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202402881

14 *DEFRA (2024). National Air Quality Objectives* https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update_20230403.pdf

Table 1 Key Measures of the AAQD, Compared with Former Directives and the UK Air Quality Standards Regulations 2010 - cont.

Measure/ element	Former Air Quality Directives (2004/107/EC[11] and 2008/50/EC[12])	New Ambient Air Quality Directive ((EU) 2024/2881[13])	UK Air Quality Standards Regulations 2010[14]
Penalties	Enforcement varied; violations led to referrals to the European Court via infringement procedures	Mandates effective, proportionate domestic penalties for infringements, with clear statutory frameworks	No specific provision for penalties for non-compliance with limit values or target values
Public access to information	Required Member States to publish monitoring data, limit exceedances, health advice, and short-term plans	Strengthens transparency with real-time AQ indices, hourly data, health impact guidance, and targeted information for vulnerable groups. Also sets thresholds to trigger alerts and information	Requires at least daily info on some pollutant levels, info on health impacts in the case of exceedance of some target values
Monitoring and modelling	Defined spatial representativeness and modelling guidance; allowed time extension flexibility	Expands monitoring obligations to include ultrafine particles, mandates use of advanced modelling, and strengthens spatial coverage requirements	Requires monitoring for SO_2, NO_2, NO_x, PM, lead, benzene and CO. Allows for modelling/estimation in some cases
Air quality plans	Required air quality plans where zones exceed limits, including short-term action plans	Requires robust, outcome-oriented air quality plans incorporating sensitive population measures, feasibility studies, and transparent implementation processes. MS must consult the public on plans	Requires air quality plans for zones/agglomerations that exceed limit values, including short-term action plans. Must consult the public on plans
Transboundary considerations	Provided guidance under UN/ECE CLRTAP but lacked mandatory cooperation provisions	Emphasises transboundary collaboration – MS must coordinate monitoring, modelling, assessment and measures	Devolved administrations and Secretaries of State must communicate in case of transboundary pollution issues

Table 2 details the comparable limit values from the WHO air quality guidelines, the new EU AAQD (targets for both 2026 and 2030), and the UK Air Quality Standards Regulations.[15]

Table 2 Comparison of Limit Values of WHO Air Quality Guidelines, EU AAQD Targets, UK Air Quality Standards Regulations, and Devolved Nation Divergence

	Limit value				
		New EU Ambient Air Quality Directive			
Pollutants	WHO air quality guidelines (2021)[16]	Dec 2026 (carried over from former directives)	Jan 2030	UK Air Quality Standards Regulations 2010[17,18]	Current Devolved Targets (where different to AQSR 2010)
$PM_{2.5}$ (24-hour)	15 µg/m³	-	25 µg/m³ (18/year)	-	-
$PM_{2.5}$ (annual)	5 µg/m³	25 µg/m³	10 µg/m³	20 µg/m³ (2020); 15% reduction in urban areas 2010-2020	10 µg/m³ in Scotland; 10 µg/m³ in England and Wales by 2040[19] (Environmental Targets (Fine Particulate Matter) Regulations 2023)
PM_{10} (24-hour)	45 µg/m³	50 µg/m³ (35/year)	45 µg/m³ (18/year)	50 µg/m³ (2004; 2010 in Scotland) (35/year; 7/year in Scotland)	-
PM_{10} (annual)	15 µg/m³	40 µg/m³	20 µg/m³	40 µg/m³ (2004);	18 µg/m³ in Scotland
NO_2 (1 hour)	200 µg/m³	200 µg/m³ (18/year)	200 µg/m³ (3/year)	200 µg/m³ (2005) (18/year)	-
NO_2 (24-hour)	25 µg/m³	-	50 µg/m³ (18/year)	-	-
NO_2 (annual)	10 µg/m³	40 µg/m³	20 µg/m³	40 µg/m³ (2005)	-

15 *Permitted exceedances per year are included in brackets, where applicable. Years from which the UK limit values apply are included in brackets. Where there is a difference between UK devolved nations, these are also specified. Figures in green represent the strictest limit values per pollutant, and those in red the least strict.*

16 *WHO (2021). What Are the Air Quality Guidelines? https://www.who.int/news-room/feature-stories/detail/what-are-the-who-air-quality-guidelines*

17 *DEFRA (2024). National Air Quality Objectives https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update_20230403.pdf*

18 *UK Government (2010). The Air Quality Standard Regulations 2010. https://www.legislation.gov.uk/uksi/2010/1001/schedule/3/made*

19 *UK Government (2021). Environmental Targets (Fine Particulate Matter) Regulations 2023. https://www.legislation.gov.uk/uksi/2023/96/contents/made*

Table 2 Comparison of Limit Values of WHO Air Quality Guidelines, EU AAQD Targets, UK Air Quality Standards Regulations, and Devolved Nation Divergence - cont.

	Limit value				
		New EU Ambient Air Quality Directive			
Pollutants	WHO air quality guidelines (2021)[16]	Dec 2026 (carried over from former directives)	Jan 2030	UK Air Quality Standards Regulations 2010[17,18]	Current Devolved Targets (where different to AQSR 2010)
SO_2 (10-minute)	500 µg/m³	-	-	266 µg/m³ (15-minute)(2005) (35/year)	-
SO_2 (1 hour)	-	350 µg/m³ (24/year)	350 µg/m³ (3/year)	350 µg/m³ (2004) (24/year)	-
SO_2 (24-hour)	40 µg/m³	125 µg/m³ (3/year)	50 µg/m³ (18/year)	125 µg/m³ (2004) (3/year)	-
SO_2 (annual)	-	-	20 µg/m³	-	-
Benzene (annual)	-	5 µg/m³	3.4 µg/m³	5 µg/m³ in England/Wales (2010); 3.25 µg/m³ in Scotland/NI (2010)	-
CO (15-minute)	100 mg/m³	-	-	-	-
CO (1 hour)	35 mg/m³	-	-	-	-
CO (daily 8-hour mean)	10 mg/m³	10 mg/m³	10 mg/m³	10 mg/m³ (2023)	-
CO (24-hour)	4 mg/m³	-	4 mg/m³ (18/year)	-	-
O_3 (peak season)	60 µg/m³	-		-	-
O_3 (daily 8-hour mean)	100 µg/m³	120 µg/m³ (18/year)	100 µg/m³ (3/year, Jan 2050)	100 µg/m³ (2005) (10/year)	-

See Appendix for other pollutants.

National Emission Reduction Commitments

The EU **National Emission Ceiling Directive (2016/2284)**[20] entered into force on 31 December 2016 and was amended in 2023 to update the methodology for reporting projected emissions of some pollutants. It sets reduction targets for the EU-28 and for each Member State (including the UK) for emissions of five air pollutants with significant negative human health and environmental impacts. Member States are required to draw up national air pollution control programmes (with public consultation), the first by 1 April 2019, including the emission reduction measures necessary to meet the reduction targets. They must also prepare annual national emission inventories, plus emissions projections every two years. In addition, they must provide public information on the programmes and any updates to them, and on the national emission inventories and projections.

The Directive is due to be reviewed by the end of 2025,[21] to assess the extent to which it has met the objective of protecting human health and the environment, to take into account the clean air targets of the 2021 Zero Pollution Action Plan, and to assess coherence with broader EU air quality and other policies. This review may set new emission reduction targets beyond 2030.

The UK targets included in the NEC Directive were transposed in the **National Emission Ceilings Regulations 2018**.[22] The reduction targets remain unchanged since then. The Retained EU Law (Revocation and Reform) Act 2023 revoked the requirement to prepare and implement a national air pollution control programme. An inventory of UK emissions of the pollutants in scope must still be prepared annually, along with projections every two years.

Table 3 Comparison of EU28 and UK Reduction Targets

	EU28 reduction target (compared with 2005)		*UK reduction target (compared with 2005)*	
Pollutant	Any year 2020-2029	Any year from 2030	Any year 2020-2029	Any year from 2030
Sulphur dioxide (SO_2)	59%	79%	59%	88%
Nitrogen oxides (NO_x)	42%	63%	55%	73%
Non-methane volatile organic compounds (NMVOC)	28%	40%	32%	39%
Ammonia (NH_3)	6%	19%	8%	16%
Fine particulate matter ($PM_{2.5}$)	22%	49%	30%	46%

20 *European Union (2016). Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX-%3A02016L2284-20240206*

21 *European Commission (2025). Evaluation of the National Emission Reduction Commitments Directive. https://environment.ec.europa.eu/topics/air/reducing-emissions-air-pollutants/national-emission-reduction-commitments-directive-evaluation_en*

22 *UK Government (2018). The National Emission Ceilings Regulations 2018. https://www.legislation.gov.uk/uksi/2018/129/contents*

It is important to note that the UK's reduction targets for SO_2 and NO_x are higher than the EU28 reduction targets because in 2005 the UK emitted higher volumes of these key pollutants than the EU28 average. The UK therefore had to achieve greater emission reductions to reach a comparable emissions level.

The Clean Air Bill

The UK parliament is currently in the process of considering a backbench bill that would establish clean air as a human right under UK law. The Clean Air (Human Rights) Bill[23] outlines the requirement to achieve clean air within five years of the act's proposed passing. The definition of 'clean air' would involve the UK Health Security Agency in setting and reviewing pollutant limits, but the Bill proposes consulting WHO guidelines along with those from the United Nations Economic Commission for Europe (UNECE). Pollutant concentration limits initially scheduled in the Bill represent a significant tightening versus both current UK limits and EU limits. The Act, if passed, would also establish a Citizens' Commission for Clean Air, with powers to institute or intervene in legal proceedings should the government fall short of its responsibilities.

23 *House of Parliament (2025). Clean Air (Human Rights) Bill. https://publications.parliament.uk/pa/bills/cbill/58-03/0210/220210.pdf*

CLIMATE LEGISLATION

Changes to our climate are strongly likely to influence emissions and the movement of pollutants affecting our air as well as seasonal and geographical locations of the air we breathe. For example, hotter summers including heatwaves will likely lead to build up of ozone (O_3) and PM, and emissions of nitrogen compounds (NH_x) and methane (CH_4) are expected to increase with higher temperatures, leading to greater deposition of reactive nitrogen on sensitive ecosystems.[24]

Both the EU and UK are world leading in their target-setting ambition to tackle climate change and have put in place various measures to help them reach these goals.

The establishment of emissions trading schemes (ETS) are perhaps the best-known instruments, and though they are primarily designed at curbing emissions of gases such as carbon dioxide to tackle global warming, it is widely understood that there may be co-benefits in tackling air pollution too. Several sources of greenhouse gases (GHG) are also responsible for some of the most damaging health-related air pollution impacts such as from agriculture, electricity generation, indoor cooking and heating, industry, transport, and the waste sector.

In short, climate change has a twin role, in that the major causes of climate change have similar roots to the leading sources of air pollution, and an impact of climate change is to further exacerbate air pollution.

Core climate laws

The **European Climate Law (Regulation (EU) 2021/1119)**[25] wrote into legislation the European Green Deal goal for the EU as a whole to become climate-neutral by 2050. It also sets an intermediate target to reduce net greenhouse gas (GHG) emissions by at least 55% by 2030 (compared to 1990 and after

24 *The Royal Society (2021). Effects of Net Zero Policies and Climate Change on Air Quality. https://royalsociety.org/-/media/policy/projects/air-quality/air-quality-and-climate-change-report.pdf*

25 *European Union (2021). Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119*

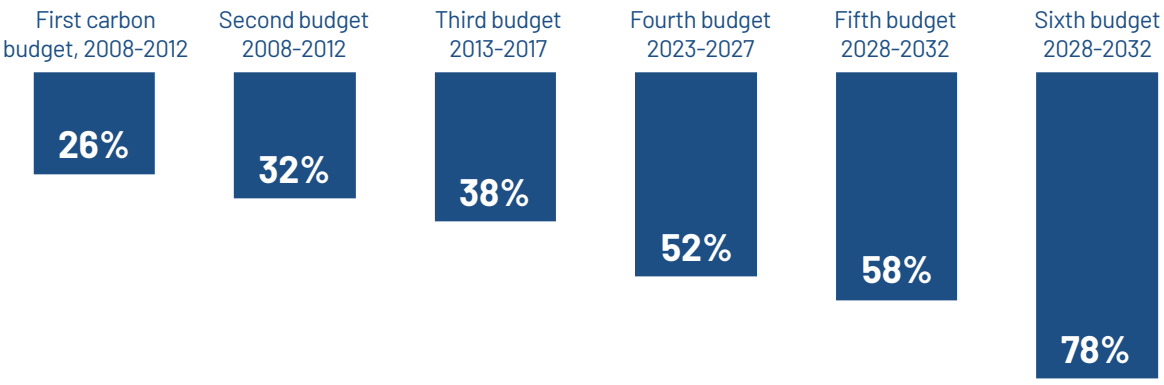
deduction of removals). The Law also set out a process to create a 2040 climate target; in July 2025, the European Commission proposed a 90% GHG reduction target, again compared to 1990 levels. This proposal is currently being discussed by the European Parliament and the Council.

In addition to the targets, the European Climate Law aims to ensure all EU policies, economies, and societies contribute to the goal through sector-specific roadmaps including emissions reductions, green technology investments and measures to protect the natural environment. The Law states that climate neutrality should be achieved in a socially fair and cost-efficient way and should be irreversible. The Law also includes measures to monitor progress (which will be reviewed every five years) and adjust action if needed to ensure the climate neutrality target is achieved.

The **UK Climate Change Act 2008**[26] was the first national climate law of its kind, initially requiring an 80% reduction in GHG emissions by 2050. In June 2019, the Act was amended to set a legally binding target to reach net zero by 2050, matching the climate neutrality target of the European Climate Law. The devolved nations also have their own legislation and targets.[27] The **Climate Change Act (Northern Ireland) 2022** sets a legally binding net zero target for 2050, plus an interim 2030 reduction target of 48%, and a requirement to establish carbon budgets. The **Climate Change (Scotland) Act 2009** sets a net zero target for 2045, with interim reduction targets of 75% by 2030 and 90% by 2040, and a requirement to produce a Scottish Climate Change Adaptation Programme. The **Environment (Wales) Act 2016** aims for net zero by 2050, with interim targets of a 63% reduction by 2030 and 89% by 2040 and also mandates the Welsh Government to set carbon budgets.

Although the UK is not bound by the European Climate Law, the UK's Climate Change Act contains a specific provision allowing target percentages for the UK carbon account (carbon budget) to be amended in light of significant developments in European or international law or policy, or in scientific knowledge about climate change. The progressive carbon budget targets so far are as follows: a 26% reduction below 1990 levels (First carbon budget, 2008-2012), 32% (Second, 2013–2017), 38% (Third, 2018–2022), 52% (Fourth, 2023–2027), 58% (Fifth, 2028–2032) and 78% (Sixth, 2033–2037). The Seventh carbon budget (2038–2042) will be set in 2025. All UK carbon budget targets to date have been met.

Progressive carbon budget targets (below 1990 levels)



26 *UK Government (2008). Climate Change Act 2008. https://www.legislation.gov.uk/ukpga/2008/27/contents*
27 *Climate Change Committee (N.D.) https://www.theccc.org.uk/climate-action/ Accessed 04/08/2025*

Emissions trading schemes

The EU Emissions Trading System (ETS) is a market-based system requiring polluters to pay for their greenhouse gas (GHG emissions). It operates on a 'cap-and-trade' principle, whereby there is a cap set on the total allowable emissions, and polluters can trade credits. This allows polluters with lower emissions than their allowances to sell their excess credits, while those exceeding their allowances can buy more. The cap is reduced over time to lower overall GHG emissions.

The 2023 revision of the **EU Emissions Trading Scheme Directive**[28] tightened the cap, to bring emissions down by 62% by 2030 (compared to 2005 levels). Free allocation of allowances to companies will be scaled down and made conditional on their decarbonisation efforts; free allocation in the aviation sector will be removed as of 2026. Maritime transport emissions are included in the EU ETS from 2024. In addition, Member States committed to use all ETS revenues (or the financial equivalent) to support climate action and a just, green transition, leading to increases in the budgets for the Innovation Fund and Modernisation Fund.

ETS2[29] was adopted in May 2023, to cover CO2 emissions from fuel combustion in buildings, road transport and some other sectors (mainly small industry not previously covered by the EU ETS). It set a cap to reduce emissions by 42% by 2030 (compared to 2005 levels). Unlike the original ETS, there will be no free credits; all credits must be purchased at auction. Monitoring and reporting of emissions by fuel suppliers will begin in 2025, with ETS2 planned to become fully operational in 2027.

The UK left the EU ETS at the end of 2020, launching its own **UK ETS** on 1 January 2021, in accordance with the provisions of the Climate Change Act 2008 to establish trading schemes. The UK ETS was formally created by the **Greenhouse Gas Emissions Trading Scheme Order 2020 (S.I. 2020/1265)**. It currently covers energy-intensive industries (e.g. oil refineries, iron, steel, cement, glass and paper production), electricity generation and aviation. Maritime emissions will be brought into scope in 2026; discussions are underway on the inclusion of waste incineration/energy-from-waste; and non-CO_2 agriculture emissions may be considered in future. For Phase 1 of the UK ETS (2021–2030), a multi-year cap was set of 1,366 $MtCO_{2e}$, which was 5% lower than the UK's share under the EU ETS. The 2021 annual cap was set at just under 156 million allowances (equivalent to around 156 $MtCO_{2e}$), with annual caps gradually reducing to reach 86.7 MtCO2e by 2025. The cumulative cap for Phase 2 (2026–2030) has initially been set at 303 $MtCO_{2e}$, with the annual cap for 2030 set at 49.3 $MtCO_{2e}$. The number of available ETS allowances will reduce by 45% between 2023 and 2027, with the number of free allowances also decreasing.[30]

The EU ETS is aiming for a 62% reduction in emissions by 2030 compared to 2005 levels. Although the ETS directly targets CO_2, these emissions reductions will have notable co-benefits for air quality, as reduced reliance on fossil fuels and increased energy efficiency have impacts on key air

28 *European Commission (N.D.) About the EU ETS. https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/about-eu-ets_en#eu-ets-legislative-framework Accessed 22/09/2025*

29 *European Commission (N.D.) ETS2: Buildings, Road and Additional Sectors. https://climate.ec.europa.eu/eu-action/carbon-markets/ets2-buildings-road-transport-and-additional-sectors_en Accessed 22/09/2025*

30 *HM Treasury (2025). Factsheet: Carbon Border Adjustment Mechanism. https://www.gov.uk/government/publications/factsheet-carbon-border-adjustment-mechanism-cbam/factsheet-carbon-border-adjustment-mechanism*

quality pollutants such as particulate matter and SO_2. A 2024 study[31] estimated that by 2021, the EU ETS and EU emission standards were together responsible for the following pollutant reductions relative to 2005 levels:

- 15.2 million tons of SO_2 (18.3% reduction)
- 0.9 million tons of $PM_{2.5}$ (3.3% reduction)
- 4.8 million tons of NO_x (2.4% reduction)

In May 2025, the UK committed formally to working towards linking the UK ETS with the EU equivalent. This co-operation is intended to create a larger, more liquid carbon market, which would reduce barriers to trade and promote international investment in decarbonisation. While the UK is not currently considering direct convergence on the EU ETS2 system, it does plan to extend the scope of the national ETS from 2026 to cover domestic maritime emissions and is considering other inclusions.[32] Alignment agreements with the EU may ultimately prompt the UK to expand to the scope of ETS2, including road transport and fuel combustion in buildings.

Carbon border adjustments

The EU's **Carbon Border Adjustment Mechanism (CBAM)**[33] was adopted in May 2023 and entered into a transitional application phase from 1 October 2023 to the end of 2025. The definitive regime, with associated financial consequences, will run from 2026. The aim of CBAM is to put a fair carbon price on specific imported goods (initially cement, iron and steel, aluminium, fertilisers, electricity and hydrogen) based on their embedded GHG emissions. This is intended to have two core effects. First, it levels the playing field for businesses operating within the EU who may be undermined by cheaper imports with a higher carbon footprint than domestic goods. Second, and it encourages non-EU countries towards cleaner industrial production. EU importers buy CBAM certificates, at a price based on the weekly average auction price of ETS allowances. The Commission proposed a simplification to CBAM[34] in February 2025, primarily to exempt companies that do not exceed a threshold of 50 tonnes of imported goods per importer per year, but also to simplify authorisations, data collection and emissions calculations and verifications.

The UK is developing its own carbon border adjustment mechanism, the **UK CBAM**. The primary legislation was published for consultation[35] in April 2025, with the UK CBAM expected to be operational at the start of 2027. It will have the same goals as the EU CBAM, to place a carbon price on certain imported goods (including iron, steel, aluminium, cement, hydrogen, fertiliser and ceramics) to prevent companies offshoring damaging activities to jurisdictions with less stringent regulations (carbon leakage), to protect domestic industry and to maintain climate ambition.

31 *P. Basaglia, J. Grunau, & M.A. Drupp, The European Union Emissions Trading System might yield large co-benefits from pollution reduction, Proc. Natl. Acad. Sci. U.S.A. 121 (28) e2319908121. https://doi.org/10.1073/pnas.2319908121 (2024).*

32 *UK Government (2025). UK Emissions Trading Scheme Scope Expansion: Maritime. https://www.gov.uk/government/consultations/uk-ets-scope-expansion-maritime-sector/uk-emissions-trading-scheme-scope-expansion-maritime-html*

33 *European Commission (N.D.). Carbon Border Adjustment Mechanism. https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en Accessed 10/10/2025*

34 *European Commission (2025) Omnibus I. https://commission.europa.eu/publications/omnibus-i_en*

35 *UK Government (2025) Draft Legislation: Carbon Border Adjustment Mechanism. https://www.gov.uk/government/consultations/draft-legislation-carbon-border-adjustment-mechanism*

Importers will pay a levy that reflects the carbon price in the UK ETS.

Although CBAM is primarily targeted at GHG emissions, its creates a strong economic incentive for overseas producers to invest in cleaner technologies, which creates the co-benefit of reduced air pollution.

EU Effort Sharing Regulation 2021-2030[36]

The **EU Effort Sharing Regulation (ESR)**, initially adopted in 2018 and amended in April 2023, sets national 2030 GHG reduction targets for Member States in sectors not covered by the EU ETS (domestic transport (not aviation), buildings, non-CO_2 agriculture emissions, small industry and waste). Together these sectors account for almost 60% of total domestic EU emissions. The current EU-wide target is to reduce emissions by 40% compared to 2005 levels; national Member State reduction targets were increased by the 2023 amendment, previously ranging from 0–40% and now ranging from 10–50%. The ESR also sets annual emission allocations (AEAs), which are effectively total emission limits for each Member State, decreasing annually between 2021 and 2030.[37]

The UK does not have a direct equivalent to the EU ESR, instead including non-ETS sectors in its carbon budgets and sector-specific strategies under the Climate Change Act 2008. The 78% emissions reduction target of the Sixth carbon budget is stricter than the reduction target of 37% set for the UK in the 2018 ESR,[38] although this is an economy-wide target also including emissions from both ETS and non-ETS sectors.

EU Social Climate Fund[39]

The Regulation creating the EU Social Climate Fund (SCF) was adopted in May 2023 and entered into force on 5 June 2023. The Fund will begin operating in 2026, pooling revenues from the auctioning of ETS2 allowances and 50 million allowances from the existing EU ETS. Member States must also make a mandatory 25% contribution to their Social Climate Plans, meaning that the Fund should mobilise over EUR 86.7 billion for 2026–2032. The Fund will provide Member States with dedicated financing to directly support vulnerable groups, notably households in energy or transport poverty, and micro-enterprises, for example through investments in energy efficiency, buildings renovation, clean heating and cooling, integration of renewable energy, and zero- and low-emission mobility. Member States may also choose to provide some temporary direct income support.

Some of the projects that may be funded by the SCF could support improved air quality. For example, investment in low-emission vehicles and public transport can lead directly to air

36 *European Commission (N.D.) Effort Sharing – Member States' Emission Targets and Flexibilities.* https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en

37 *European Union (2020) : Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02020D2126-20240731

38 *European Union (2018) Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030.* https://eur-lex.europa.eu/eli/reg/2018/842/oj/eng

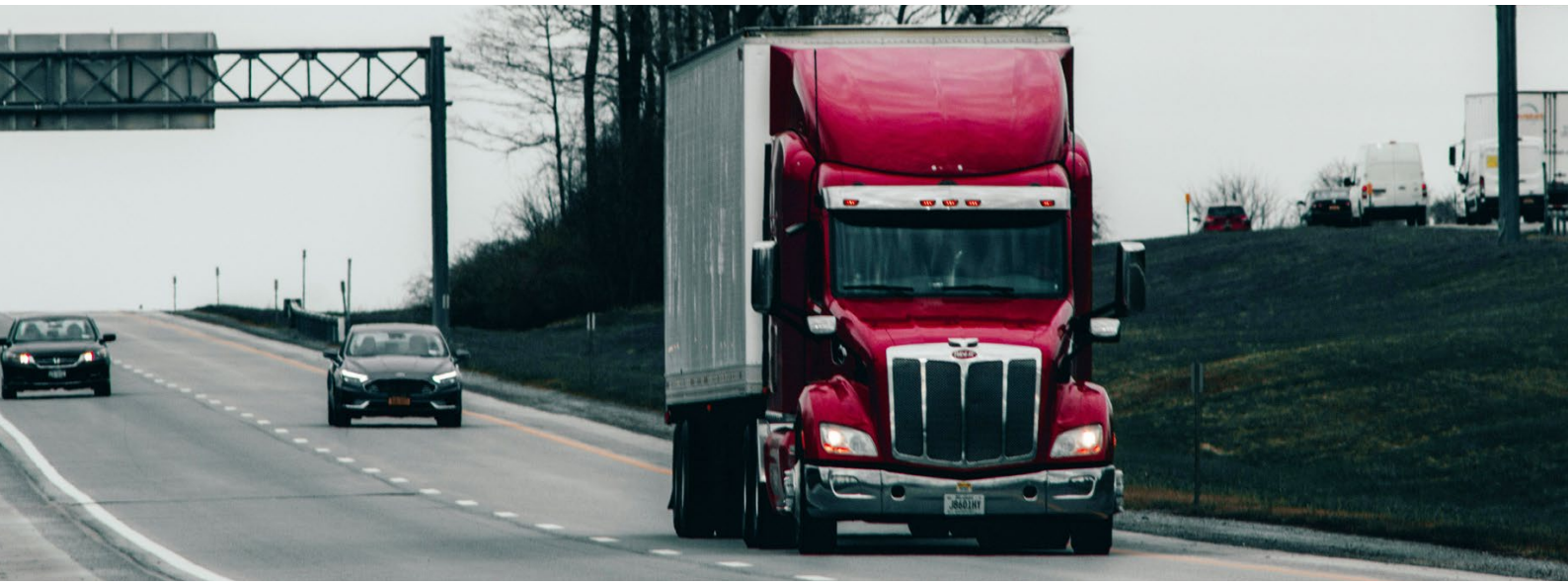
39 *European Commission (N.D.) Social Climate Fund.* https://climate.ec.europa.eu/eu-action/carbon-markets/social-climate-fund_en *Accessed 12/11/2025*

quality improvements. Meanwhile, broader investment in energy efficiency in buildings and cleaner heating systems can reduce the need for fossil fuels. Member States have a high degree of flexibility to make funding bids according to national priorities, but must partially co-fund all projects.

Member States were expected to draft national Social Climate Plans by June 2025, based on broad stakeholder consultation, and listing and explaining their planned measures and investments. Payments will only be disbursed by the Commission to Member States if they meet the milestones and targets set in the plans.

There is currently no single UK equivalent to the EU Social Climate Fund. However, it perhaps presents a model that could be emulated to earmark some revenues from other environmental levies in the UK.

TRANSPORT LEGISLATION



Many citizens will be able to readily make the link between forms of transport (particularly cars with an internal combustion engine – ICE) with poor air quality and many will recognise that more efficient engines and/or fewer ICE cars on our roads will help to reduce pollutants damaging for people's health. Indeed, tackling emissions at source by amending product standards (like removing lead from petrol) has had a large impact on the quality of the air we breathe. However, addressing the performance standards of cars and light commercial vehicles, has been continuing as described below. The spectre of a complete ban on the sale of new ICE vehicles slated for 2030 in the UK and 2035 in the EU looms large too.

What is less well known though are regulatory changes being made to requirements of fuels for the aviation and maritime sectors and these are described below too.

Emissions standards for cars and vans

The EU **Regulation on CO2 emission performance standards for new cars and light commercial vehicles**[40] was amended in April 2023 to strengthen the standards and align them better with the EU's 2050 climate neutrality ambition. The progressively tougher standards (applied to manufacturers' EU-wide fleets) will effectively phase out new internal combustion engine (ICE) vehicles by 2035, eliminating tailpipe emissions of $PM_{2.5}$, NO_2, and hydrocarbons. The Regulation also allows for emission credits if 25% of manufacturers' cars and/or 17% of their vans are zero and low emission vehicles (ZLEVs), or if eco-innovations can be demonstrated (these credits essentially slightly raise the manufacturers' g CO_2/km target). An excess premium of EUR 95 per g/km applies for exceedance of a manufacturer's fleet emissions target. Manufacturers can create pools to jointly meet targets, and there are exemptions for small-volume manufacturers.

40 *European Commission (N.D.) Light Duty Vehicles. https://climate.ec.europa.eu/eu-action/transport-decarbonisation/road-transport/cars-and-vans_en*

The progressive EU targets from 2020–2035 are outlined in Table 4.

Table 4 EU CO_2 Targets - Car Emissions

	EU fleet-wide CO_2 emission targets			
Vehicle type	2020-2024	2025-2029	2030-2034	2035 onwards
Passenger cars	95g CO_2/km	93.6g CO_2/km	49.5g CO_2/km	0g CO_2/km
Light commercial vehicles (vans)	147g CO_2/km	153.9 g CO_2/km	90.6g CO_2/km	0g CO_2/km

Until 2021, the UK followed the EU CO_2 targets, which were retained under the European Union (Withdrawal) Act 2018. In 2024, the Vehicle Emissions Trading Schemes Order 2023[41] enacted a **Zero Emission Vehicle (ZEV) Mandate**, which places progressively tighter restrictions on the number of non-zero emission vehicles manufacturers may sell each year. The ZEV mandate currently means that 80% of new cars and 70% of new vans sold in Great Britain must be zero emission by 2030, increasing to 100% by 2035.[42] This timeline therefore aligns with the EU goal for 100% zero-emission vehicles by 2035, albeit by using targets based on the quantity of ZEVs sold rather than on fleet-wide CO_2 emissions.

The **Euro 7 regulation**[43] was adopted in April 2024. It sets limits (to apply from 2026/27) for exhaust emissions from road vehicles. Changes to the limits from Euro 6 include: 60 mg/km for NO_x (the same as Euro 6 for petrol vehicles, but a reduction of 20 mg/km for diesel vehicles, to align the two fuel types); 4.5 mg/km for PM (applied only to diesel in Euro 6, but Euro 7 applies it also to petrol); and 10 mg/km for ammonia (not regulated in Euro 6). For the first time, Euro 7 also introduces limits for particle emissions from brakes (3 mg/km for battery EVs, 7 mg/km for combustion/hybrid/fuel cell cars, and 11 mg/km for vans) and tyres (which will be set in delegated acts by mid-2026, based on tyre class). This reflects the estimate that non-exhaust emissions are one of the biggest sources of microplastics released into the environment and will represent up to 90% of all road transport particle emissions by 2050.[44]

In the UK, a provisional type approval scheme was put in place post-Brexit, with a full **GB type approval scheme** entering into force in January 2023, to apply to new models put on the market from February 2024. For cars and vans, the current GB type approval aligns with Euro 6 standards. As of June 2025, there has not yet been a definitive decision on whether Euro 7 equivalent requirements will be adopted in the GB type approval scheme.[45]

41 *UK Government (2023). The Vehicle Emissions Trading Scheme Order 2023. https://www.legislation.gov.uk/uksi/2023/1394/contents*

42 *UK Government (2024). Pathway for Zero Emission Vehicle Transition by 2035 Becomes Law. https://www.gov.uk/government/news/pathway-for-zero-emission-vehicle-transition-by-2035-becomes-law*

43 *European Union (2024). Regulation (EU) 2024/1257 of the European Parliament and of the Council of 24 April 2024 on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7). https://eur-lex.europa.eu/eli/reg/2024/1257/oj/eng*

44 *Ibid.*

45 *Vehicle Certification Agency (2025). GB Type Approval Scheme. https://www.vehicle-certification-agency.gov.uk/vehicle-type-approval/gb-type-approval-scheme/gb-type-approval-scheme-faqs/#Legislation*

Regulation of transport fuels

The **FuelEU Maritime Regulation**[46] was adopted in September 2023 and fully entered into force at the start of 2025. It sets progressively tougher GHG intensity limits for fuels used in all ships over 5,000 gross tonnage calling at EU ports (accounting for 55% of ships and 90% of maritime CO2 emissions). A 2% decrease is required by 2025, 6% by 2030, 14.5% by 2035, 31% by 2040, 62% by 2045 and 80% by 2050. The targets cover emissions of CO2, methane and NO_x. From 2030 or 2035, ships moored in port must use either onshore power supply (OPS) or alternative zero-emission technologies (with the 2030 date applying to ports covered by the AFIR, and the 2035 date to all EU ports with OPS capacity). The UK does not yet have equivalent legislation and continues to rely on the International Maritime Organisation for shipping fuel standards.

The **ReFuelEU Aviation Regulation**[47] was adopted in October 2023 and entered fully into force from the start of 2025. It aims (but does not set a mandatory target) to reduce CO_2 emissions from aviation by at least 60% by 2050 (compared to 1990 levels), by requiring aviation fuel suppliers to gradually increase the share of sustainable aviation fuels (SAF) blended into fuel supplied at EU airports, and the share of SAF comprised of synthetic aviation fuels.

The UK has equivalent legislation in the form of a SAF Mandate, via the **Renewable Transport Fuel Obligations (Sustainable Aviation Fuel) Order 2024**.[48] This also obligates the use of an increasing amount of SAF in the overall UK aviation fuel mix. It requires SAF to achieve a minimum of 40% GHG emissions reductions compared to fossil fuels.

Table 5 summarises the required minimum shares of the ReFuelEU Aviation Regulation and the UK SAF Mandate. Whilst the UK minimum share for 2030 is more ambitious than that of the EU, minimum shares for subsequent years are higher in the EU, with the UK choosing to maintain the 22% share until there is more certainty on the long-term development of SAF.

However, it is important to note that the potential impact of so-called "sustainable aviation fuels" has come under scrutiny, mostly due to limitations in the scalability of SAF production.

46 *European Commission (N.D.). Decarbonising Maritime Transport. https://transport.ec.europa.eu/transport-modes/maritime/decarbonising-maritime-transport-fueleu-maritime_en Accessed 25/10/2025*

47 *European Commission (N.D.). ReFuelEU. https://transport.ec.europa.eu/transport-modes/air/environment/refueleu-aviation_en Accessed 25/10/2025*

48 *UK Government (2024). The Renewable Transport Fuels Obligations Order 2024. https://www.legislation.gov.uk/uksi/2024/1187/contents/made*

Table 5 ReFuelEU Aviation Regulation and UK SAF Mandate: Required Minimum Shares

	EU ReFuelEU Aviation Regulation		*UK SAF Mandate*
Year(s)	Share of SAF (minimum)	Share of synthetic aviation fuels within SAF (average)	Share of SAF (main obligation)
From 2025	2%	n/a	2%
From 2030	6%	1.2% (2030-2031) 2% (2023-2034)	10%
From 2035	20%	5%	~16%
From 2040	34%	10%	22%
From 2045	42%	15%	22%
From 2050	70%	35%	22%

The UK participates in the **Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)** and has implemented it into national law. CORSIA is an international scheme to control and offset the growth of CO_2 emissions from international flights by requiring airlines to buy carbon credits to compensate for emissions above a 2019 baseline.[49]

The EU **Alternative Fuels Infrastructure Regulation (AFIR)**[50] was adopted in September 2023 and entered into force in April 2024. It sets mandatory national targets for minimum alternative fuels infrastructure for road vehicles, maritime vessels and stationary aircraft, e.g. total power output to be provided to cars/vans through publicly accessible recharging stations; maximum distance between, and power output of, publicly accessible recharging pools for road vehicles; and targets for deployment of shore-side electricity supply for vessels in ports and electricity supply to stationary aircraft at specified TEN-T airports. There is no equivalent legislation in the UK, although rollout of alternative fuel infrastructure is guided and supported by policy, funding, and initiatives by local authorities.

Transport taxes and charges

The concept of designating urban areas for specific pollution controls is not new. Following the Great Smog of London of 1952, the Clean Air Act 1956 established "smokeless zones" in some cities. More recently, with a focus on vehicle emissions, **Clean Air Zones** have been created to target emissions in cities. The **Transport Act 2000** created the legislative basis for local authorities to

49 *Institute for Policy Studies (IPS)(2024). Greenwashing the Skies. https://ips-dc.org/report-greenwashing-the-skies/*

50 *European Commission (N.D.). Alternative Fuels Infrastructure. https://transport.ec.europa.eu/transport-themes/clean-transport/alternative-fuels-sustainable-mobility-europe/alternative-fuels-infrastructure_en*

employ "road user charging". London launched its first "low-emission zone" in 2008 to reduce heavy-polluting diesel vehicles. This expanded to the "ultra-low-emission zone" **(ULEZ)** in 2019, which introduced charges for a broader range of polluting road vehicles. The ULEZ charging zone was expanded in 2023, creating the world's largest pollution charging zone. The Mayor of London has attributed the city's success in meeting NO_2 limit values to the ULEZ scheme.[51]

Seven cities in England currently have Clean Air Zones: Bath, Birmingham, Bradford, Bristol, Portsmouth, Sheffield, and Tyneside (Newcastle and Gateshead). The **Transport Scotland Act 2019** also introduced low-emission zones in Scotland; the country operates CAZs in Glasgow, Edinburgh, Aberdeen and Dundee. Wales currently has no Clean Air Zones.

A new **Vehicle Excise Duty (VED)** structure based on CO_{2e} bands was introduced in 2001. At present, VED rates for cars registered between 1 March 2001 and 31 March 2017 are graduated according to CO_2 emissions, whereas cars first registered on or after 1 April 2017 pay a first year rate that is graduated according to CO_2 emissions. This means that older, more polluting vehicles pay higher VED than newer, less polluting vehicles.

51 *The Independent (30/09/2025). Khan hails Ulez success as London under limit for toxic pollutant for first time. https://www.independent.co.uk/climate-change/news/london-sadiq-khan-ulez-no2-kings-college-london-b2836787.html*

ENERGY LEGISLATION

In the UK demand for electricity is set to double by 2050.[52] Alongside the growth in deployment of renewable technologies (wind, solar, hydroelectric etc), the Government will be relying on gas and biomass-fired power stations along with carbon capture storage (CCS) technology.[53] The reliance on these non-renewable forms of energy is likely to have an impact on the quality of our air, as their combustion releases particulate matter, NO_2, SO_2, VOCs and CO. Greater energy efficiency and improving the energy performance of buildings therefore, as well as a shift towards more renewable technologies more generally, will have a large co-benefit towards air quality. Further, tackling particularly potent greenhouse gases like methane (which contributes 13% of total UK GHG emissions), will also improve air quality. Methane is a contributor to ground level ozone and is heavily linked with respiratory diseases and damage to agriculture production including reduced growth rates and crop yields.

Energy

The **Renewable Energy Directive (RED III) ((EU) 2023/2413)**[54] builds upon earlier iterations of the Directive (2009/28/EC & (EU) 2018/2001) which the UK implemented when still a member of the EU.

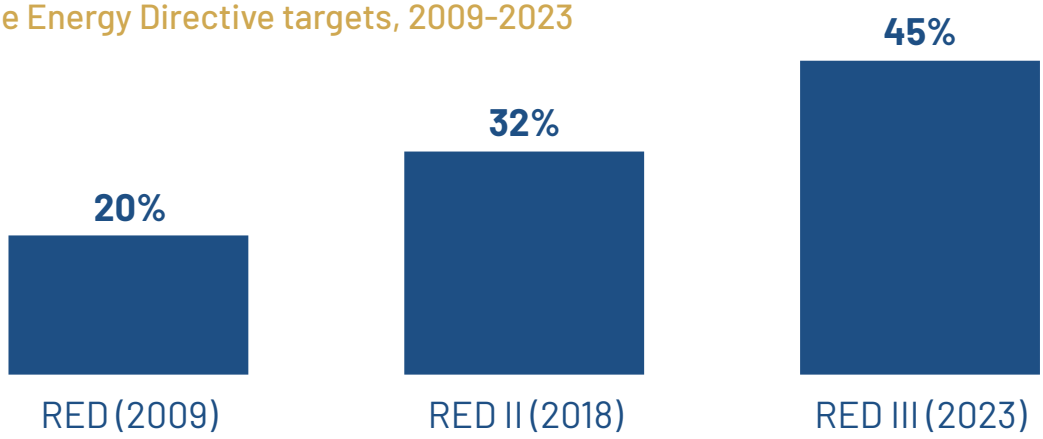
RED III was adopted on the 31 October 2023 and entered into force 20 November 2023 and increases the binding overall EU target for renewable energy to 42.5% by 2030 but sets an 'aspirational' goal of 45%.

52 *Department for Energy Security and Net Zero (2025). Government Response to the National Infrastructure Commission's Study 'Electricity Distribution Networks: Creating Capacity for the Future'. https://assets.publishing.service.gov.uk/media/68679354d520affe4e581cc7/nic-study-electricity-distribution-networks-government-response.pdf*

53 *Nuclear power will also play a role.*

54 *European Commission (N.D.). The Revised Renewable Energy Directive. https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en#the-revised-directive Accessed 12/10/2025*

Renewable Energy Directive targets, 2009-2023



The RED provides a policy framework to facilitate electrification, with new, higher, sector-specific targets for renewables in heating and cooling, transport, industry, buildings and district heating/cooling, and puts in place a framework to promote electric vehicles and smart recharging. To do this, RED III sets out requirements to simplify and speed up permitting procedures for renewable energy projects whilst acknowledging legitimate local concerns about development.

The transition from fossil fuels to renewables in the power and heating sectors could help to deliver co-benefits by reducing emissions of air pollutants from their combustion, especially SO_2 and NO_x.

The share of renewable energy sources in the EU's energy consumption has increased steadily from 12.5% in 2010 to 24.5% in 2023[55] with several countries across the EU already meeting this headline target.

The UK also already exceeds the headline target of the RED III even though it is not obligated to meet this (UK renewables stood at 51.8% in 2024)[56] though sector specific targets for example around the installation of heating and cooling systems has been more difficult to achieve in the UK. The Climate Change Committee state that, "Electrification of heating is central to eliminating emissions from homes... The UK is behind many other similar countries in rolling out heat pumps".[57] Recent academic studies[58] point to gas boilers for example as a leading source of air pollution in central London, particularly NO_x and possibly exceeding transport as the primary contributor.

The Labour Government, since entering office in 2024, has initiated a **Clean Power Action Plan**[59] which aims to meet 100% of electricity demand by 2030 (this has subsequently been revised downwards to 95%) from 'clean' power (renewables such as wind, solar and bioenergy; nuclear, gas with carbon capture and storage, and hydrogen).

55 *Ibid.*

56 *Ember (2025). The United Kingdom. https://ember-energy.org/countries-and-regions/united-kingdom/*

57 *Climate Change Committee, 7th Carbon Budget report, February 2025. https://www.theccc.org.uk/publication/the-seventh-carbon-budget/#post-49721-_Toc187753760*

58 *Evidence of Heating-Dominated Urban NOx Emissions. Samuel J. Cliff, Will Drysdale, Alastair C. Lewis, Sarah J. Møller, Carole Helfter, Stefan Metzger, Rob Liddard, Eiko Nemitz, Janet F. Barlow, and James D. Lee. Environmental Science & Technology 2025 59 (9), 4399-4408. DOI: 10.1021/acs.est.4c13276. https://pubs.acs.org/doi/10.1021/acs.est.4c13276*

59 *UK Government (2024). Clean Power 2030 Action Plan. https://www.gov.uk/government/publications/clean-power-2030-action-plan*

To reduce methane emissions from the energy sector, the UK Government aims to end routine venting and flaring from oil and gas operations by 2030, in line with regulations from the **North Sea Transition Authority (NSTA)**.[60]

The revised **Energy Efficiency Directive (EU/2023/1791)**[61] sets a binding, EU-wide energy efficiency target to ensure an additional 11.7% reduction in energy consumption by 2030, compared to projections from 2020, and establishes 'energy efficiency first' as a fundamental principle of EU energy policy that must be considered by Member States in relevant policy and major investment decisions in energy and non-energy sectors.

The **RePowerEU Plan**[62] aims to decrease EU dependency on Russian fossil fuel imports by saving energy, diversifying energy supplies and producing clean energy. It was launched in part as a reaction to the war in Ukraine and as a result the EU have banned all imports of Russian coal. To date, the EU has dropped its share of Russian gas imports from 45% to 19%. However, following early reductions, Russian gas imports to the EU rebounded in 2024, leading to the publication of a new Roadmap in 2025 with the objective to fully end EU dependency on Russian energy,[63] including Member State national plans by end of 2025, with all gas imports to stop at the end of 2027

The RePowerEU plan also aims to speed up the green transition and promote renewable energy. Since 2022, it has seen almost 338 GW of new solar energy capacity installed, and wind capacity increased by 234 GW. As of 2025, just over 47% of EU electricity now comes from renewables.

The revision of the **Energy Taxation Directive**[64] (currently still under negotiation) proposes a simplified tax categorisation for energy products. Fuels with the greatest negative environmental impact would be subject to higher minimum rates, i.e., the highest minimum rate would apply to conventional fossil fuels like gas, oil and petrol. Further, exemptions for home heating and for intra-EU air and maritime transport will no longer be able to be fully exempt from energy taxation. This directive is designed to better align taxation policies with climate and energy laws. The co-benefit to air quality will be that it will likely make cleaner energy products more attractive and competitive, thus gradually helping to reduce combustion of fossil fuels. The UK implemented the previous/current EU directive on energy taxation (2003/96/EC)[65] and has also introduced specific taxes such as the Climate Change Levy (CCL) and Energy (Oil and Gas) Profits Levy (though the latter was not designed specifically to align energy products with the UK's climate policy). The CCL however is designed to encourage businesses to be more energy efficient and play a role in reducing the UK's greenhouse gas emissions[66] – again the co-benefit to this being a reduction in fossil fuel consumption and thus air emissions.

60 *Environment and Climate Change Committee (2024). Methane: Keep Up the Momentum. https://publications.parliament.uk/pa/ld5901/ldselect/ldenvcl/45/4509.htm*

61 *European Commission (N.D.) Energy Efficiency Directive. https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en Accessed 28/10/2025*

62 *European Commission (N.D.) RePowerEU. https://commission.europa.eu/topics/energy/repowereu_en Accessed 13/10/2025*

63 *European Commission (2025). Roadmap to Fully End EU Dependency on Russian Energy. https://commission.europa.eu/news-and-media/news/roadmap-fully-end-eu-dependency-russian-energy-2025-05-06_en*

64 *European Commission (N.D.). Revision of the Energy Taxation Directive. https://taxation-customs.ec.europa.eu/taxation/excise-duties/revision-energy-taxation-directive_en Accessed 24/09/2025.*

65 *European Union (2003) Council Directive 2003/96/EC. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:283:0051:0070:EN:PDF*

66 *House of Commons Library (2009). Climate Change Levy. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:283:0051:0070:EN:PDF*

Buildings

The **Energy Performance of Buildings Directive**[67] is a revision to an earlier directive which the UK implemented when it was a member of the EU. Adopted in May 2024, it aims to help the EU achieve its goal to reduce energy consumption by 11.7% by 2030, stimulate roll-out of renewables in buildings, and contribute to more sustainable and affordable housing. Member States are required to develop national building renovation plans to decarbonise the building stock and gradually introduce minimum energy performance standards for non-residential buildings. The 16% worst-performing buildings should be renovated by 2030, and the 26% worst-performing buildings by 2033. For residential buildings, each Member State will set a national trajectory to reduce average primary energy use by 16% by 2030 and 20–22% by 2035. At least 55% of the reduction should be achieved through renovation of the worst-performing buildings. To achieve decarbonisation goals, zero-emission buildings will be the new standard for new buildings and Member States must also ensure new buildings are solar-ready (i.e. for photo-voltaic or solar thermal installations). Fossil fuel boilers will be gradually phased out; financial incentives for stand-alone fossil fuel boilers will end from 1 January 2025.

A proposed amendment to the **UK Building Regulations** known as **Part Z** would mandate comprehensive life-cycle assessments (LCAs) of carbon emissions from buildings, including manufacture and transport of materials. If introduced, Part Z would require developers to assess and report LCA carbon emissions of new building projects exceeding 1,000m^2 or comprising more than ten dwellings. By encouraging the use of materials with lower embodied carbon, Part Z would promote alternatives that require less energy-intensive manufacturing processes and transport, with likely positive implications for air quality.

Government plans to ban domestic gas boilers by 2035 have since been withdrawn.

Methane in the energy sector

A new **Regulation on methane emissions reduction in the energy sector**[68] entered into force 4 August 2024, aiming to stop avoidable release of methane into the atmosphere and minimise leaks by fossil energy companies operating in the EU. Key measures include improved measurement, reporting and verification of methane emissions, mandatory leak detection and repair, a ban on venting and flaring practices, and a methane transparency requirement on imports (including information on how exporters are measuring, reporting and abating methane emissions). In the UK, the Government has opted to support a non-legislative, industry led approach to tackling methane emissions from the energy sector, in particular by committing to ending routine flaring and venting from oil and gas installations.

67 *European Commission (N.D.) Energy Performance Buildings Directive. https://energy.ec.europa.eu/topics/energy-efficiency/energy-performance-buildings/energy-performance-buildings-directive_en Accessed 09/10/2015*

68 *European Commission (N.D.) Methane Emissions. https://energy.ec.europa.eu/topics/carbon-management-and-fossil-fuels/methane-emissions_en Accessed 10/10/25*

INDUSTRIAL POLLUTION LEGISLATION

Tackling emissions of air pollutants by setting operational and process standards for large industrial facilities has been a focus of the Industrial Emissions Directive and its precursor legislation for several decades. Emissions from such large industrial facilities are a key source of NO_x, SO_2, VOCs and PM and though the UK and EU have been successful in tackling emissions from the most polluting industries, the role of offshoring of heavy industries to other parts of the world over several decades is a factor too.

The EU has recently revised its main legislation in this area however and attempted to tackle the growing share of NH_3 emissions by capturing more intensive livestock farms within its scope. The UK has not followed suit but is currently consulting on changes to regulations linked to the previous Industrial Emissions Directive.

The **Zero Pollution Action Plan**[69] set out in 2021 is an overarching EU strategy and establishes a 'zero pollution' vision for air, water and soil pollution to be achieved by 2050. The plan sets specific air quality targets:

- Reduce the health impacts (number of premature deaths) caused by air pollution by 55% by 2030.
- Reduce by 25% the EU ecosystems where air pollution threatens biodiversity.

69 *European Union (2021) Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0400&qid=1623311742827*

According to the European Environment Agency (EEA)[70] and the European Commission[71] there has been a 45% reduction of the health impacts (premature deaths) of air pollution between 2005-2020, with a stable reduction trend. The outlook[72] for 2030 is that progress is on track, with a likely 62–69% reduction by the target date, based on proposed measures and thus exceeding the 2030 target.

The EEA[73] also report that there has been a 13% reduction in impacted areas where air pollution threatens biodiversity from 2005–2022. The 4th Clean Air Outlook[74] however finds that progress is unlikely to remain on track, with only a 20% likely reduction by 2030, based on proposed measures.

Emissions from industry

The **Industrial Emissions Directive 2.0 (2024/1785 Industrial and Livestock Rearing Emissions Directive)**[75] is the main EU instrument to reduce industrial emissions to air, water and land, and to prevent waste generation from large industrial installations and intensive livestock farms (pig and poultry). It is also a revision of an earlier directive (2010/75/EU) that the UK implemented into domestic law. The IED covers large-scale pig and poultry farms but not small scale farms, extensive farms, or cattle farms.

The revision captures a larger number of installations and industries within its scope. It applies to 37,000 industrial installations, 38,500 pig and poultry farms, landfills, metal extraction and battery gigafactories, sets stricter emissions limit values and more stringent conditions for derogations and extends IED to more activities (including mining of metal, manufacturing of batteries, waste landfills, and more intensive pig and poultry farms) to reduce unregulated emissions. The new directive has a greater focus too than its predecessor on strengthening and broadening public information, participation and access to justice and provides for a legal right for people to seek compensation for damages to their health caused by illegal pollution.

Air pollution from two major sources is specifically addressed by the new directive. First, there are specific rules for large combustion plants (LCPs), including minimum requirements for emission limit values for certain pollutant emissions. Then, with regard to emissions from intensive agriculture, the largest and most polluting pig and poultry farms (30% of such farms), are addressed too, to help reduce nitrogen pollution. The European Commission will also publish a specific report on addressing livestock (cattle) emissions in 2026 (this sector represents about 50% of the EU's methane emissions and 25% of the EU's ammonia emissions) and will consider how to address pollution linked to imported livestock.

70 *EEA (N.D.) State of Europe's environment not good: threats to nature and impacts of climate change top challenges. https://eea.europa.eu/en/european-zero-pollution-dashboards/zero-pollution*

71 *European Commission (N.D.). Clean Air Outlook. https://environment.ec.europa.eu/topics/air/clean-air-outlook_en Accessed 13/11/2025*

72 *Joint Research Centre (2022). Zero Pollution Outlook. https://joint-research-centre.ec.europa.eu/zero-pollution-outlook-2022_en* and *https://environment.ec.europa.eu/topics/air/clean-air-outlook_en*

73 *EEA (N.D.) State of Europe's environment not good: threats to nature and impacts of climate change top challenges. https://eea.europa.eu/en/european-zero-pollution-dashboards/zero-pollution*

74 *European Commission (N.D.) Clean Air Outlook. https://environment.ec.europa.eu/topics/air/clean-air-outlook_en Accessed 21/10/25*

75 *European Commission (N.D.) Industrial and Livestock Rearing Emissions Directive. https://environment.ec.europa.eu/topics/industrial-emissions-and-safety/industrial-and-livestock-rearing-emissions-directive-ied-20_en Accessed 21/10/2025*

New laws in England have been put in place to try and reduce emissions from industry too. The **Environment Act 2021** established a legal duty for the Government to set new, legally-binding long-term air quality targets via secondary legislation. These new targets were subsequently set through the **Environmental Targets (Fine Particulate Matter) (England) Regulations 2023**. To meet such a target, reductions in industrial emissions are likely to be required. There has also been changes to **Extended Producer Responsibility (EPR)** rules which mandate that businesses account for the disposal costs of their products. Industries must reduce emissions from factories and incinerators and ensure products are designed for durability and recyclability to meet these new regulations.

In August 2025, Defra published a consultation to review environmental permitting for industry. This could potentially affect many of the industries within scope of the existing industrial emissions legislation. However, the consultation has excluded from its scope any issues related to agriculture, unlike the IED.

To address industrial emissions from agriculture, Defra has produced The Code of Good Agricultural Practice (COGAP) as a guidance document to encourage the farming industry to reduce ammonia emissions. In particular, it contains guidance on the storage and application of organic manures, the application of inorganic fertiliser, and modifications to livestock diet and housing.[76]

Product standards

The most important product standards in the UK relating to air quality concern the use of domestic fuels. Modelling emissions from domestic burning is an uncertain task relative to modelling other emission sources, so effects on air quality can be hard to quantify precisely. However, in 2019, the UK Clean Air Strategy stated that domestic burning is the main contributor to the UK's primary PM emissions. While UK domestic burning is lower than across much of the EU,[77] its relatively high contribution to $PM_{2.5}$ emissions makes it an area of concern.

The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020 require manufacturers to certify that their solid fuels have below 20% moisture content and a sulphur content below 2% (or less for manufactured fuels). These limits are intended to reduce PM and SO_2 emissions from domestic burning.

While other product standards have a much smaller role to play in air quality in the UK, there is some further relevant legislation.

The Volatile Organic Compounds in Paints, Varnishes and Vehicle Refinishing Products Regulations 2012 implement EU Directive 2004/42/EC and set limit values for volatile organic compounds (VOCs) in certain products.

The Sulphur Content in Certain Liquid Fuels Directive (Directive 2016/802) sets limits on the sulphur content in gas oils and heavy fuel oils to reduce SO_2 emissions and air pollution.

76 *UK Government (2024). Code of Good Agricultural Practice for Reducing Ammonia Emissions. https://www.gov.uk/government/publications/code-of-good-agricultural-practice-for-reducing-ammonia-emissions/code-of-good-agricultural-practice-cogap-for-reducing-ammonia-emissions*

77 *Mitchell, E.J.S, Cottom, J.W., Phillips, D., Dooley, B. (2019). A review of the impact of domestic combustion on UK air quality. Independent report commissioned for HETAS. Leeds, UK. https://www.gov.scot/binaries/content/documents/govscot/publications/foi-eir-release/2021/03/foi-202000124475/documents/foi202000124475---information-released-2/foi202000124475---information-released-2/govscot%3Adocument/FOI202000124475%2B-%2BInformation%2Breleased%2B2.pdf*

LAND, AGRICULTURE AND NATURE LEGISLATION

Changes in land use, for example through deforestation or afforestation, the draining or wetting of peatlands, or the growing of crops for biofuels, can all affect air quality. Emissions to air can also be affected by changes to levels and types of food production.

The Climate Change Committee reported that tree planting rates will need to double from the current average, approximately 15,000 to over 30,000 hectares per year by 2030 to help the UK meet its legally binding net-zero emissions target by 2050.[78] Trees not only help support efforts to manage water quantity (e.g. floods and drainage) and quality challenges, provide shade in urban areas and enhance biodiversity, but are also a valuable tool in capturing particulate emissions from various sources (through the process known as 'deposition'). However, there is evidence that some tree planting can have negative effects too, by increasing volatile organic compound (VOC) emissions .

Land use change as a result of growing crops for bioenergy can also affect air quality, specifically the combustion process is likely to increase particulate matter and NO_x emissions.[79]

The EU's **Common Agricultural Policy**[80] (2023-27) has several objectives, including contributing to climate change mitigation and adaptation – by reducing GHG emissions, enhancing carbon sequestration and promoting sustainable energy as well as encouraging sustainable and efficient management of natural resources, including by reducing chemical dependency. It aims to protect air quality by encouraging reductions in ammonia emissions, placing restrictions on the burning of residues and preventing the spraying of pesticides in windy conditions. Member States must

78 *Climate Change Committee (2025). Progress in Reducing Emissions: 2025 Report to Parliament. https://www.theccc.org.uk/publication/progress-in-reducing-emissions-2025-report-to-parliament/#post-52125-_Toc200096323*

79 *DEFRA (2018) Impacts of Vegetation on Urban Air Pollution. https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1807251306_180509_Effects_of_vegetation_on_urban_air_pollution_v12_final.pdf*

80 *European Commission (N.D.). The Common Agricultural Policy at a Glance. https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27_en Accessed 02/10/2025*

display a higher ambition on environment and climate action compared to the previous multi-year period and design interventions that tackle local and regional causes of air pollution.

At least 25% of the direct payments budget is allocated to eco-schemes, providing stronger incentives for climate-and environment-friendly farming practices and approaches, and at least 35% of rural development funds are allocated to measures to support climate, biodiversity, environment and animal welfare.

The EU's common monitoring and evaluation framework (CEMF) indicates that ammonia emissions from agriculture declined by 32.8% from 1990-2021 and GHG emissions from agriculture (including cropland and grassland) fell by 31.7% from 1990–2022.[81]

Linked to the CAP, the **'Farm to Fork'**[82] Strategy aimed to make food systems fair, healthy and environmentally friendly (with a neutral or positive environmental impact, including helping to mitigate and adapt to climate change, and protecting air). Measures with potential air quality impacts included:

- An aim to reduce nutrient losses (like ammonia) by 50% by 2030, including by reducing the use of fertilisers by at least 20% by 2030
- An aim to reduce the overall use and risk of chemical pesticides by 50% and the use of more hazardous pesticides by 50% by 2030
- An objective for at least 25% of agricultural land to be under organic farming by 2030
- An aim to promote more sustainable and carbon-efficient methods for livestock production, which can contribute to reducing enteric methane from ruminants and ammonia from manure.

However, the Farm to Fork Strategy was dropped in February 2025. Following consultation with stakeholders, the EU unveiled the **Vision for Agriculture and Food 2025–2040**, which is intended to simplify regulations, prioritise essential food production, and introduce a generational renewal strategy for farmers.

The EU's **Nature Restoration Regulation**[83] was highly controversial when it passed into law in 2024, with many Member States and parliamentarians attempting to weaken and prevent the law's passing.[84] It requires Member States to put into place area-based restoration measures covering at least 20% of land and 20% of sea areas by 2030 and covering all ecosystems in need of restoration by 2050. The new law acknowledges the benefit high-diversity landscape features on

81 *European Commission (N.D.). Climate Change and Air Quality. https://agridata.ec.europa.eu/extensions/DashboardIndicators/Climate.html?select=EU27_FLAG,1 Accessed 09/10/2025*

82 *European Commission (N.D.). Farm to Fork Strategy. https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en Accessed 09/10/2025*

83 *European Commission (N.D.). Nature Restoration Regulation. https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-regulation_en Accessed 09/10/2025*

84 *Politico (2023) How repairing nature became the EU's most contentious green project. https://www.politico.eu/article/how-repairing-nature-became-the-eus-most-contentious-green-project/*

agricultural land have for air filtration, the role of forests in regulation of air and climate and the role of urban green spaces in air filtration. It also requires Member States to take into account national air pollution control programmes when preparing their national restoration plans.

The **Regulation on Land Use, Forestry and Agriculture (LULUCF)**[85] revises an earlier Regulation and sets binding net carbon removal targets for Member States, who must align their national plans with these targets and promote sustainable land management practices and carbon farming schemes. It also requires the application of data from advanced monitoring technologies (e.g. satellites) to improve monitoring, reporting, and verification of emissions and removals across land use, land-use change, and forestry (LULUCF).

The **Climate Change Act 2008** requires the UK to report annually on all greenhouse gas (GHG) emissions, including LULUCF, under its framework of carbon budgets and long-term emissions reduction targets. LULUCF emissions are factored into the "net UK carbon account", which is used to compare emissions against the carbon budgets, ensuring that the UK's progress in reducing overall emissions is accurately tracked. LULUCF emissions of particular relevance to air quality include ammonia (NH_3), nitrogen oxides (NO_x), and VOCs.

The **Net Zero Growth Plan** is a government strategy to support the decarbonisation goals set out in the Climate Change Act. It is intended to support agriculture's transition to net zero emissions by 2050 through initiatives including promoting better land management to increase carbon sequestration in soils and vegetation, boosting productivity to reduce inputs, and decarbonising agricultural machinery. Of particular relevance to air quality are moves to reduce methane and nitrogen oxide emissions from livestock, manure stores, and soils.

The **National Planning Policy Framework (NPPF)** makes air quality a crucial component of planning decisions by requiring development to contribute to improving or mitigating air pollution, especially in Air Quality Management Areas (AQMAs) and Clean Air Zones (CAZs).

AQMAs can be designated by a local authority where national air quality objectives are not met. The local authority then creates an Air Quality Action Plan (AQAP) to improve air quality through monitoring, identifying sources, and implementing strategies such as improved public transport, cleaner vehicles, or greener land-use planning. Once an AQMA is declared, the council must monitor the air, create a draft plan within 18 months, and finalise it within two years to address specific pollutants and protect public health

Clean Air Zones are designed to reduce air pollution in designated urban areas by restricting or charging high-polluting traffic. London's CAZ, named the "Ultra-Low Emissions Zone" (ULEZ) charges a broader range of vehicles and has higher emissions standards than other CAZs, but apparent benefits have been notable. For example, NO_2 pollution in London fell below the national legal limit values in 2024, where other major cities including Birmingham, Manchester and Liverpool still exceeded the limits.[86] The Mayor of London attributed the success to the introduction of ULEZ.[87]

85 *European Commission (N.D.) Land Use Sector. https://climate.ec.europa.eu/eu-action/land-use-sector_en Accessed 03/11/2025*
86 *UK Government (2025). Air Pollution in the UK 2024. https://www.gov.uk/government/publications/air-pollution-in-the-uk-2024*
87 *BBC (01/10/2025) London Nitrogen Dioxide Levels Fall to Legal Limit. https://www.bbc.co.uk/news/articles/c75q9d2pqyeo*

INDOOR AIR QUALITY LEGISLATION

Air quality policy has historically focused on outdoor ambient air quality. However, more recently, attention has been drawn to indoor air quality. Currently, legislation pertaining to indoor air quality is largely restricted to workplaces. The Health and Safety at Work Act 1974 and the Workplace (Health, Safety and Welfare) Regulations 1992 require employers to maintain acceptable air quality standards. Building regulations also include requirements for ventilation (Approved Document F), while the Control of Substances Hazardous to Health (COSHH) Regulations 2002 included provision for hazardous substances that can be inhaled.

CONCLUSION

From transport policy to energy policy, to agriculture and land use policy, to climate and industrial pollution policy, changes are being made to a wide array of legislation in the EU that have a bearing on and provide co-benefits to air quality.

In some cases, this is entirely new legislation (such as the FuelEU Maritime Regulation, Social Climate Fund) that has been created after the UK left the EU and had little or no involvement in shaping. In other areas, the EU is amending legislation that the UK had a strong role in crafting and passing into law while it was a member. These laws have, by and large, remained on the UK statute book after Brexit and are the basis of laws which impact air quality in the UK today. The EU, for example, is building upon existing tailpipe emissions standard for ICE vehicles by mandating the Euro7 standard, a key source of NO_x. It is making changes to industrial emissions legislation by capturing a greater share of intensive livestock farms, a key source of ammonia emissions; and it is requiring Member States put in place tighter energy requirements in buildings (less fossil fuel combustion and thus less NO_x, SO_2 and PM). All of these will have distinct co-benefits for air quality.

Yet, it is the EU's core air quality legislation where progress towards a 'zero pollution' future is clearest.

The 2024 Ambient Air Quality Directive is a significant 'upgrade' on the previous 2008 directive upon which UK air quality regulations are based . The new directive amends various emission limit values, tightening up and steering those towards WHO guideline targets. As such, the UK has 'fallen behind' the EU and it is now up to lawmakers in the four nations of the UK to catch up. Though neither EU nor UK legislation meets WHO guideline recommendations for air quality standards, EU law is now broadly closer towards those standards than is the UK. It remains to be seen of course whether these will be achieved in practice, as implementation remains key.

Aside from the 'hard' quantifiable standards that the new directive puts in place, it also has a greater emphasis on a citizen's right to compensation where there are human-health-related impacts due to air pollution violations. This is a key difference. A court's verdict in 2020 that nine-year-old girl, Ella Adoo-Kissi-Debrah, who had been living in London, died due to poor air quality, underlines the significance of including such a measure in core air quality legislation.

The trends in air pollution levels across Europe – both in the EU and the UK – indicate that overall levels of air pollution are reducing. As, for example, older coal fired power stations close in favour of cleaner, greener alternatives like wind and solar, so the impact of NO_x and SO_2 lessens. Similarly, as more people switch to electric vehicles a concomitant reduction in NO_x and PM follows. Relative levels are likely to vary as seen by the 'growing' impact of agriculture, and changes in land use and food supply (NH_3, PM, VOCs and O_3) are considered.

Our expectations and understanding of the impacts of air pollution on our health and our ecosystems have changed too.

What is clear though is that reductions in air pollutants in Europe have not been by accident. Successive policy changes, tighter emission standards and more demanding air quality laws have set Europe on a path towards cleaner air. The UK had a role in driving the EU's air quality laws when it was a member of the club. Each of the four nations now have to decide whether they wish to build on that legacy and reduce further the damage caused by poor air quality. Aligning with the new standards in the EU provides an initial benchmark for this ambition towards those targets set by the WHO. However, the UK has the opportunity to go even further with its ambitions than the EU, becoming a world leader in policy for cleaner air.

APPENDIX

Table 2 Comparison of Limit Values of WHO Air Quality Guidelines, EU AAQD Targets, UK Air Quality Standards Regulations, and Devolved Nation Divergence - cont.

	Limit value				
		New EU Ambient Air Quality Directive			
Pollutants	WHO air quality guidelines (2021)	Dec 2026 (carried over from former directives)	Jan 2030	UK Air Quality Standards Regulations 2010	Current Devolved Targets (where different to AQSR 2010)
Lead (annual)	–	0.5 µg/m³	0.5 µg/m³	0.25 µg/m³ (2008)	–
Arsenic (annual)	–	6 ng/m³	6 ng/m³	6 ng/m³ (2012)	–
Cadmium (annual)	–	5 ng/m³	5 ng/m³	5 ng/m³ (2012)	
Nickel (annual)	–	20 ng/m³	20 ng/m³	20 ng/m³ (2012)	–
Benzo(a) pyrene (annual)	–	1 ng/m³	1 ng/m³	1 ng/m³ (2012)	–
1,3-butadiene	–	–	–	2.25 µg/m³ (2003)	–

LIST OF ABBREVIATIONS

CO_{2e}
Carbon dioxide equivalent, a unit used to express the global warming impact of greenhouses gases as a single, comparable number.
CO_2
Carbon dioxide
ETS (2)
Emissions Trading System (2), the EU system for tradable carbon credits.
NO_2
Nitrogen dioxide
NH_3
Ammonia

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