NZET/S6/25/27/2

Net Zero, Energy and Transport Committee
Tuesday 16 September 2025
27th Meeting, 2025 (Session 6)

Consideration of petition PE2123: Update air quality standards in Scotland to align with 2021 World Health Organisation guidelines

Public Petitions

1. Petitions are a way to ask the Parliament to do something. Under the Parliament's Standing Orders (rules 15.4 to 15.8) the Committee may take such action as it considers appropriate in relation to any petition. This may include—

   (a) referring the petition to the Scottish Ministers, any other committee of the Parliament or any other person or body for them to take such action as they consider appropriate;

   (b) reporting to the Parliamentary Bureau or to the Parliament;

   (c) taking any other action which the Committee considers appropriate; or

   (d) closing the petition. If a petition is closed, the petitioner must be notified of the reasons. It is good practice for the Committee to agree in its public discussion of any petition it intends to close, the reason(s) why it is being closed.

2. More information on the petition process is on the Scottish Parliament website.

Background

3. The petitioner (Gareth Brown on behalf of Asthma and Lung UK Scotland) is calling on the Scottish Parliament to urge the Scottish Government to amend the Air Quality Standards (Scotland) Regulations 2010 by setting new limit values for nitrogen dioxide (NO2) and fine particulate matter (PM2.5) so as to align with the 2021 World Health Organisation (WHO) air quality guidelines.

4. The full petition PE1750 can be viewed on the Scottish Parliament website here. The Petitioner also provided written evidence to accompany the petition on 25 November 2024.

5. The current legal limits for NO2 and PM2.5 (40 µg/m^3 and 10 µg/m^3 respectively) are set out in the Air Quality Standards (Scotland) Regulations 2010. These are based on the 2005 WHO air quality guidelines.

6. In 2021, WHO produced updated air quality guidelines, which halved the previously recommended limits. Using the 2023 local authority annual reports, Asthma and Lung UK Scotland found that 60 of the 85 automatic monitoring sites would meet the new 2021 guidelines for NO2 and 35 of the 82 monitoring sites would meet the guidelines for PM2.5.

7. A background paper from the Scottish Parliament Information Centre (SPICe) was published ahead of consideration by the Citizen Participation and Public Petitions Committee.

Prior consideration of the petition

8. In its initial consideration of the petition, the Citizen Participation and Public Petitions Committee agreed to write to the Scottish Government for its views. The Scottish Government provided a response on 11 December 2024. This says:

> "The Government's current air quality strategy, Cleaner Air for Scotland 2 ["CAFS2"], expires in July 2026. A planned review of the strategy will consider current air quality standards and objectives, and the World Health Organisation's updated guideline values will be a factor in our considerations. We will be engaging with stakeholders as the review progresses, and updates will be made publicly available in due course."

9. On 22 January 2025, the Citizen Participation and Public Petitions Committee considered the response and agreed to refer the petition to this Committee following a suggestion that the Scottish Government's progress towards its new air quality strategy is something this Committee would likely be scrutinising at some point.

Consideration of air quality by this Committee

10. On 11th May 2023, this Committee published its report on the Scottish Government's Air Quality Improvement Plan and wider air quality issues, following a short inquiry. The report stated that:

> "The Committee supports the aspiration of adopting the 2021 WHO guidelines on air pollutants as a statutory measures, but accepts that immediate adoption presents major practical challenges. We urge the Scottish Government to work with local authorities and others to map out pathways for achieving these ambitious targets. We also ask the Scottish Government to consider enshrining a continuous improvement approach into air quality policy, as part of its upcoming review of CAFS2"

11. The Scottish Government's response of 12 June 2023, stated that:

> "We are currently considering the ambitious targets referenced by the Committee [the new WHO guidelines] in the context of both CAFS2 delivery and development of the next air quality strategy which will be the outcome of the CAFS2 review. We will announce the outcomes of these considerations in due course. Continuous improvement is at the heart of our work on air quality and we will ensure that this is fully reflected in our review of CAFS2 and future strategies."

12. On 25 February, the Committee had an evidence session with SEPA about various matters within its remit including air quality. SEPA was asked whether it considered current air quality standards to be compatible with the best evidence in relation to delivering a healthy environment. SEPA said that if the Scottish Government were to review air quality standards then SEPA "would be supportive of a shift towards aligning with the new WHO guidelines from 2021".

13. On 1 February 2024, Environmental Standards Scotland (ESS) published a report based on its analytical work into particulate matter in air. This noted the WHO's revised 2021 air quality guidelines. The report recommends that the Scottish Government review its standards for particulate matter as part of its forthcoming review of CAFS2.

14. On 25 March, the Committee took evidence from ESS on various matters, including their February report. ESS told the Committee that the Scottish Government was considering this report in the context of its review and revision of its Clean Air for Scotland strategy. ESS said they would continue to monitor exactly what progress is being made and that they "would very much like to see a tightening of the air quality standards to meet or move towards what is recommended by the World Health Organisation".[1]

15. The Committee discussed its approach to the petition on 1 April and agreed to write to the Scottish Government to get an update on its review of the CAFS2 strategy. The Scottish Government responded on 22 April (see Annexe A).

16. The Committee discussed the petition again on 13 May and agreed to write to stakeholders who engaged with its short 2023 inquiry on air quality plus a small number of other relevant stakeholders, drawing their attention to the Scottish Government's response of 22 April and asking them a series of questions regarding the petition.

17. The Committee received 14 responses, which have been published on the Committee's website. A summary of the points raised is provided in Annexe B.

[1] Net Zero Energy and Transport Committee, Official Report, 25 March, col 44

Decision on the petition

18. Options for next steps include:

    a) writing to the Scottish Government urging them to align the Scottish targets with the WHO guidance, as the petitioner has requested. It would be up to the Committee how much detail to go into in the letter; for instance on a proposed date for achieving this alignment;

    b) writing to the Scottish Government setting out the key issues raised in the written evidence and asking how these are being considered in the review of the Cleaner Air for Scotland 2 (CAFS2) strategy and the long-term policy framework;

    c) holding an evidence session with relevant stakeholders (for example, Asthma + Lung UK Scotland, SEPA, ESS, health professional bodies and local authority representatives) and/or the Scottish Government, to explore in more depth how updated WHO guidelines and related concerns will be reflected in the strategy review and long-term policy framework;

    d) closing the petition, noting that ESS has committed to ongoing monitoring and that the Committee could return to the matter in future work, including future evidence sessions with SEPA, ESS or the Scottish Government. The Committee could also highlight the issue in its legacy report.

19. If the Committee chose option (a), it could either wait for the Scottish Government's response and continue the petition until then or close the petition now on the basis that it has not set out its settled position, which aligns with the petitioners'. As per option (d), this would not preclude the Committee revisiting the issue of air quality in future work.

Clerks to the Committee
September 2025

Annexe A – Response from the Cabinet Secretary for Net Zero and Energy to the NZET Committee letter of 10 April

Petition 2123 – Update air quality standards in Scotland to align with 2021 World Health Organisation guidelines

Thank you for your letter of 10 April 2025 requesting an update on the review of the Scottish Government's Cleaner Air for Scotland 2 (CAFS 2) strategy. I have provided responses to your questions below.

Review objectives and scope

The main objective of the review is to develop and implement a long term policy framework for air quality to succeed the CAFS 2 strategy when it expires in 2026. The review will cover existing air quality policies and objectives, air quality monitoring and the role of local authorities and other partners in delivering further air quality improvements.

Alignment with WHO guidelines

The Scottish Government is committed to continuous improvement in air quality, as there is increasing evidence that even very low concentrations of certain pollutants can have impacts on human health and the natural environment. The review of current objectives is a key part of this process.

The review of current Scottish statutory air quality objectives will take into account the 2021 WHO guidelines. It is important to bear in mind that the guidelines are set at the lowest level of exposure above which there is at least moderate certainty evidence for adverse health effects. They are not legally binding and do not take into account the economic, practical or technological feasibility of adoption as policy objectives or in legislation.

Timeline and implementation

The Scottish Government will work closely with partner organisations during the remainder of 2025 to develop the scope of the review in more detail. A formal public consultation on proposals will follow in 2026, with the new framework anticipated to be published before the end of next year.

Integration with other policies

Effective co-ordination of policies can deliver co-benefits for both greenhouse gas and air pollutant reduction. The CAFS 2 review and the new framework will be closely aligned with the draft Climate Change Plan and also with other Scottish Government plans and strategies that have implications for air quality, notably in policy areas such as transport, health, agriculture and energy.

EU alignment

As with the WHO guidelines, the review will take into account the updated EU Ambient Air Quality Directive.

Annexe B – Summary of Evidence Received

Fourteen submissions were received and published. Submissions were received from:

- Prof. Campbell Gemmell
- Environmental Rights Centre for Scotland (ERCS)
- Communities Against Woodsmoke
- Public Health Scotland
- Royal College of Physicians of Edinburgh (RCPE) Air Pollution Working group
- NASUWT, the Teachers' Union
- Sustrans Scotland
- Environmental Standards Scotland
- Asthma + Lung UK Scotland
- UKRI Clean Air Champions
- Invica Industries Group
- SEPA
- City of Edinburgh Council, Local Air Quality Management
- Fife Council

Below is an overview of the key issues raised, structured around the four questions posed to stakeholders.[2]

Question 1 — Do you support amending the 2010 Regulations to align with the 2021 WHO air-quality guidelines?

There is strong support for amending the Air Quality Regulations to align with the 2021 WHO guidelines. Public-health considerations were the primary driver, coupled with a desire for a clear, enforceable legal framework and coherence with evolving EU standards. Several respondents wanted these changes made soon, especially for NO_2, while others stressed achievability, phased implementation, improved monitoring capability, adequate funding, and measures to avoid unintended social or economic impacts.

Public-health rationale and urgency

Many respondents framed alignment as a public health imperative. Public Health Scotland supports "efforts to further reduce concentrations and emissions," noting the WHO guidelines are set from health evidence and "without reference to achievability," and emphasised attention to vulnerable and marginalised groups and health inequalities. ERCS highlighted air pollution's health burden in Scotland and called WHO guidance "the best available scientific evidence," arguing improved standards would reduce disease and deaths. Professor Campbell Gemmell warned that "further delay in reviewing and applying statutory standards is "potentially

[2] The Committee has also received written correspondence on the petition from Zircon Smart Buildings. The correspondence was received prior to the Committee writing to other stakeholders.

harmful" and compounds the 4-year delay in explicitly considering and potentially implementing the good practice guidelines from WHO." UKRI Clean Air Champions pointed to the Royal College of Physicians report "A breath of fresh air – Responding to the health challenges of modern air pollution". The report outlines the growing evidence of the health harms posed by breathing polluted air, even at low concentrations and sets out 19 recommendations aimed at those with a role to play in reducing exposure to air pollution in the UK. These recommendations are set out in their response. Sustrans echoed the health framing, citing UK guidance that poor air quality is "the largest environmental risk to public health in the UK."

Alignment with WHO air quality guidelines and the EU context

ESS stated that alignment with the WHO guidelines should result in a clear statutory obligation to achieve new limit values and ensure that the legal framework is robust, enforceable and capable of delivering the necessary improvements to air quality. Several stakeholders also noted the revised EU Ambient Air Quality Directive (in force since December 2024), which sets more stringent limits (by 2030) than Scotland's current ones. ERCS referred to the 'keeping pace' power under the Continuity Act, which enables Scottish Ministers to remain aligned with evolving EU environmental standards.

Current concentrations and approaches to management and measurement

Since the Committee last sought views on progress of reducing NO2 and PM2.5, Asthma + Lung UK Scotland has produced two reports focussing on these emissions and the sources of domestic burning and transport. In the report Clearing the Air: Transport + Lung Health, they analysed Local Authority Annual Reports from 2023 and found that all automatic monitoring stations, with data capture above 50%, recorded levels under the emissions limits for NO2 and PM2.5. However, they compared the levels to the WHO guidelines and found that 70.6% of monitoring sites would be under for NO2 and 42.7% for PM2.5. They have since compared the data from the 2024 Local Authority Annual Reports and there has been progress for NO2, with 79.5% of the automatic monitoring sites meeting the WHO guidelines. There has, however, been a reduction to 10% of monitoring sites under WHO PM2.5 levels.

ESS observed 12 breaches of statutory annual mean NO2 limits between 2018 and 2024 under the 2010 Regulations. Last year, they wrote to the First Minister asking for an immediate reduction of nitrogen dioxide (NO2) to 20 µg/m3 from 40 µg/m3, reaching the WHO recommended 10 µg/m3 by 2035. They note that the EU has revised its Ambient Air Quality Directive, introducing stricter limits for various pollutants, including NO2. In Scotland, the new annual limit for NO2 has been set at 20 µg/m³ by 2030, down from the previous 40 µg/m³, with the goal of achieving zero pollution by 2050.

Royal College of Physicians of Edinburgh (RCPE) states that the largest number of Air Quality Management Areas (AQMAs) have been declared in response to exceedances of NO2 and that NO2, unlike PM2.5 or PM10, fails to come close to the level advised by the WHO. Thus, they believe one initial priority is for legislation to reduce these regulatory levels of NO2 as quickly as possible, with an immediate drop to 20 µg/m3 and a timeline of 10 years to achieve 10 µg/m3. They consider it unlikely, looking at the current levels, that achieving 10 µg/m3 now can be done without societal and economic upheaval, which may have adverse effects on livelihoods and health without further measures of compensatory support. Smaller but significant falls in PM2.5 should also be planned to take Scotland close to the WHO levels, they propose a reduction to 8 µg/m³ immediately and to the WHO level of 5 µg/m³ by 2035, with a timeline for fully achieving them.

UKRI Clean Air Champions suggested exploring frameworks like Canada's Air Quality Management System (management levels triggering graduated action), and highlighted ultrafine particles, not routinely measured or specifically legislated for in Scotland.

Implementation

City of Edinburgh Council support the adoption of the WHO's guidelines "as a minimum," but flagged practical/technological challenges (e.g., monitoring low concentrations) and affordability concerns but they argued these should not outweigh public-health benefits. They argued that "targeted funding and national leadership" are essential for local authorities to deliver tighter standards and recommended learning from LEZ governance/delivery and providing means-tested support to those most impacted. Fife Council also supported a change to the limits but called for a phased approach, citing monitoring equipment limits for particulates and the need to consider wider policies where transboundary pollution dominates.

UKRI Clean Air Champions stated that standards should "reflect practicability, social acceptability, enforceability and economics and not lead to unintended negative impacts in other domains. Achievability is important – if failure to meet air quality standards is perceived as inevitable once all practicable actions are taken, this may lead to effective policy deprioritisation, because investment and change brings no likely compliance benefit."

Professor Gemmell noted that careful consideration is required, given the costs of incremental and, in some cases, marginal, improvements, especially where, for example, some pollutant guidelines may be close to background (the natural or existing baseline level of air pollution that is already present in the environment) and, further, imported pollution from North Sea basin countries, including England, is both likely under certain conditions and impossible to avoid.

NASUWT highlight that clean air strategies will have implications for jobs and employment and call for the application of Just Transition principles to ensure positive and fair outcomes for all workers.

2. What progress has been made in reducing nitrogen dioxide and fine particulate matter in Scotland since 2022/23, when we last sought views on this?

Most respondents recognise measurable progress, especially falling roadside NO_2, reductions in several AQMAs, and early benefits from LEZs. At the same time, several contributors stress that health risks persist at current concentrations ("there is no safe level of air pollution"), and they question whether $PM_{2.5}$ is improving uniformly. Concerns focus on domestic solid-fuel burning (particularly evening/weekend suburban hotspots), transport growth (including SUVs), uneven enforcement (notably engine-idling), and the need for broader action across sectors.

Overall trends and compliance

ESS reports continued improvement in particulate concentrations at many sites between 2022 and 2023: 98.7% of sites met the WHO PM_{10} guideline (15 µg/m³), up from 97.4% in 2022; 42.1% of sites met the WHO $PM_{2.5}$ guideline (5 µg/m³), up from 10.7% in 2022. One site (Perth Atholl Street) exceeded Scotland's PM_{10} annual objective in 2023, the first since 2018; there were no $PM_{2.5}$ annual objective exceedances. ESS cautions that sectoral emissions patterns are changing, with 2022 increases in PM from transport, industrial processes and waste.

SEPA states there have been no exceedances of annual mean air-quality objectives at automatic monitoring stations since 2022 and that all local authorities are currently complying with legal requirements; the number of AQMAs has fallen to 18, with further revocations/amendments expected in 2025. SEPA notes that meeting any updated objectives will require concerted, cross-sector action.

Fife Council reports "air quality is generally good with no exceedances" at monitoring locations and revoked two AQMAs (Dunfermline Appin Crescent and Cupar Bonnygate) in 2023, citing traffic management, ECO Stars (environmental fleet recognition scheme), behaviour and education initiatives, and integration with planning/transport policy. The City of Edinburgh Council reports a general decreasing trend in NO_2 below pre-pandemic levels, with four AQMAs remaining (one revoked, one reduced) and a risk of PM_{10} exceedance in its sole PM_{10} AQMA. The RCPE says "significant progress has been made," noting AQMAs had NO_2 below regulatory levels in 2023 and similar improvements for $PM_{2.5}$/PM_{10}, while emphasising that "more can be done."

In contrast, Prof. Campbell Gemmell characterises overall progress as “very little,” pointing to rising vehicle numbers, policy uncertainty around vehicle electrification, persistent behaviour patterns (e.g., school access/shopping trips), and “sketchy and inconvenient” public transport for many.

ESS notes 2022 increases in PM from industrial processes, transport and waste, while emissions from residential/other combustion, industrial combustion and energy industries fell versus 2021; agricultural PM_{10} emissions in 2022 were 2.3% higher than in 2005.

Communities Against Woodsmoke contends that $PM_{2.5}$ “may appear to be going down generally” because suburban neighbourhoods, where domestic solid-fuel burning is common, are under-monitored. They cite independent sensors showing prolonged autumn/winter $PM_{2.5}$ peaks “particularly in the evenings and at weekends,” concluding “the source can only be domestic burning.”

Enforcement gaps

ERCS highlights a “widespread lack of enforcement” of the statutory ban on engine idling despite public complaints, now under investigation by ESS. ERCS and partners have submitted recommendations to improve the regime; these have not yet been implemented. ERCS also points to a >20% rise in UK SUV sales and limited national-level measures to curb their use, noting proposals such as higher vehicle excise duty for the most polluting vehicles and advertising restrictions (the latter adopted locally by Edinburgh City Council).

3. To what extent has scientific and public health evidence about air quality evolved since the current standards were adopted? In your answer you could refer, for instance, to impacts on nitrogen dioxide or fine particulate matter on particular groups of people, the effect of Low Emission Zones (or other interventions of a similar nature) on air quality, or any new information or data about the effect of burning particular types of fuel.

Across respondents, there is strong consensus that the scientific and public-health evidence on air pollution has advanced markedly since Scotland’s current standards were set. New evidence shows health harms at lower concentrations than previously recognised (including effects on the heart, lungs, brain and mental health), greater vulnerability among specific population groups (children, pregnant people, and disadvantaged communities), and clearer links between sources, especially domestic solid-fuel/wood burning and fine particulate matter (PM2.5). Interventions such as Low/Ultra-Low Emission Zones (LEZ/ULEZ) and active-travel infrastructure are generally viewed as effective in reducing pollution and delivering wider benefits, though several respondents stress the need for robust, Scotland-specific evaluation of health outcomes. Many organisations call for adopting the WHO’s 2021 Air Quality

Guidelines in law, expanding monitoring (particularly around schools, health and care settings), strengthening public alerts and enforcement (e.g., anti-idling), and tightening controls on the most polluting fuels and appliances used in homes.

State public-health evidence

ESS highlights four major advances since the early 2000s: wider global coverage of studies; links to additional health conditions (e.g., diabetes, reproductive outcomes, neurocognitive endpoints); deeper understanding of particle characteristics and sources; and large multi-centre collaborations that quantify effects at low concentrations. The RCPE summarises recent work linking PM10, PM2.5 and NO_2 with cardio-respiratory and cancer mortality, and SO_2 with mental/behavioural-disorder mortality, noting increased admissions and reduced life satisfaction associated with pollution exposure. They also cite evidence associating small increases in PM2.5 with higher COVID-19 hospitalisations and deaths.

NASUWT state that over 40,000 people die each year in the UK where the outdoor air they breathe is a major contributory factor and that thousands of people will also die because of occupational diseases caused by air pollution at work.

Professor Campbell Gemmell points to extensive recent literature and WHO discussion materials, concluding that the evidence "reinforces everything we already know," making delay "unsupportable," while noting gaps in Scotland-specific LEZ/fuel evidence that Public Health Scotland, SEPA or health researchers might fill.

Asthma + Lung UK Scotland stresses "there is no safe level of air pollution," citing links with respiratory and cardiovascular disease, cancer, neurological and mental-health outcomes, and adverse pregnancy/child outcomes. They estimate 1,800–2,700 premature deaths annually in Scotland due to toxic air, and note an estimated £1.1bn annual cost to the economy/NHS. They cite evidence that "a single fireplace operating for one hour and burning 10lbs of wood, is estimated to emit 4,300 times more carcinogenic polyaromatic hydrocarbons than 30 cigarettes."

Asthma + Lung UK Scotland frames air pollution as a social-justice issue: lower-income groups, ethnic minorities, children and the elderly are disproportionately exposed and harmed; car access is lowest among those least responsible for transport emissions. They cite studies showing higher exposure and worse health effects for some ethnic-minority groups and greater vulnerability among children (including in-utero exposure).

In Asthma + Lung UK Scotland's 2024 survey of people with lung conditions, 49% were most concerned about road-transport pollution; many report avoiding outdoor exercise when pollution is worse (24%) and steering clear of known hotspots (34%).

Few receive air-quality alerts: “fewer than 1 in 10 (9%)” respondents reported using the Scottish “Know & Respond” alert system.

Indoor air and domestic solid-fuel/wood burning

UKRI Clean Air Champions note emerging evidence that everyday activities (cooking, cleaning) contribute substantially to poor indoor air quality; they urge considering regulation in indoor as well as outdoor spaces. ERCS also highlights growing evidence that indoor air pollution, especially from wood/coal stoves and gas boilers, can reach concentrations higher than outdoors and is linked to mental-health harms, dementia and cognitive decline. Communities Against Woodsmoke underscores that domestic combustion accounted for 20% of UK PM2.5 in 2023, with indoor wood burning alone at 11%, creating localised evening and winter hotspots. They argue even “Ecodesign” stoves can emit very high PM2.5 near neighbours and call for restrictions, citing studies on health costs and elevated lung-cancer risks among frequent users.

Asthma + Lung UK Scotland calls for banning the most polluting domestic fuels, a scrappage scheme for inefficient wood burners, and updated Smoke Control Areas legislation to strengthen local authority implementation and enforcement. Invica Industries Group proposes a ban on commercial sale of smoky coal and a switch to smokeless fuels, claiming this could reduce $PM_{2.5}$ from solid fuels by over 60%.

Effects of LEZs and other interventions

Several organisations credit LEZs with measurable NO_2 reductions and broader air-quality gains. ERCS states that LEZs, alongside Low-Traffic Neighbourhoods, active-travel infrastructure, EV charging and the removal of peak rail fares, are positive steps to shift away from polluting private vehicles. Communities Against Woodsmoke also notes “encouraging findings regarding a decrease in Nitrogen Dioxide levels in areas where LEZs have been introduced,” and highlights expanded cycling infrastructure and rail electrification (while urging habitat restoration where trees are felled). Prof. Campbell Gemmell agrees that access restrictions/LEZs “appear very likely to be beneficial,” but argues benefits must be seen against overall traffic growth and continued access by higher-polluting vehicles, with mixed public messaging on EV/hybrid policy.

The RCPE notes that LEZs are relatively new in the UK but, where more established, they show health benefits. Tokyo’s LEZ significantly decreased infant deaths, and children exposed to cleaner air in utero and during their first year needed less medication over five years studied. In Paris, pollution fell by almost 40% in a 2.5 km area around the LEZ as compliant commuters drove through these areas. UK evidence includes the London ULEZ, which showed substantial gains in labour productivity with sick leave reduced by 18.5% from pre-LEZ levels and

improvements in mental well-being. RCPE note that after the London LEZ was introduced, student test scores improved significantly, with positive effects on low-performing schools, children within the ULEZ were four times more likely to walk or cycle to school, and the Bradford LEZ was associated with lower GP attendances. They further note that Glasgow's LEZ has already delivered significant air-quality improvements in Phase 1, which focused on buses: some of the busiest city-centre bus corridors improved, and in the first year NO_2 levels in the city centre and LEZ fell by 20% compared with the previous year's diffusion-tube monitoring. City of Edinburgh Council also references recent Belgian LEZ evaluations showing effectiveness. Public Health Scotland notes Scotland has LEZs in Aberdeen, Dundee, Edinburgh and Glasgow but has not yet undertaken a systematic review of LEZ health impacts and is not aware of Scottish studies directly linking LEZs to pollutant/health outcomes; it flags the need for evaluation (e.g., its 2023 evaluability assessment using Glasgow as an example).

Sustrans' monitoring across five "Places for Everyone" schemes estimates ~10% average reductions in vehicle pollutant rates, with Glasgow's South City Way indicating a 53% reduction. They also report estimated pollutant reductions from active-travel infrastructure, aligning with the NTS hierarchy (walking, wheeling, cycling). Sustrans linked stronger standards with a need for investment in active-travel networks and reduced car use, consistent with WHO guidance and Scottish strategy statements about urban transport's role in poor air quality.

Asthma + Lung UK Scotland urges accelerating electrification of trains and buses, using Transport (Scotland) Act 2019 powers to support bus services (including council-run routes), implementing/enforcing an anti-idling ban with higher penalties, and annual audits of the EV charging network to identify gaps. Asthma + Lung UK Scotland noted LEZ implementation and investment in rail electrification and bus decarbonisation, while also pointing to policy reversals/delays on the New Build Heat Standard and on banning the most polluting fuels.

4. The Scottish Government is currently reviewing the CAFS2 strategy with the goal of establishing a long-term policy framework to replace the strategy once it expires. What practical steps can the Scottish Government set out in its new strategy to reduce nitrogen dioxide and fine particulate matter levels?

Responses to this question draw on many of the themes already discussed above. Across respondents there is strong support for tightening Scotland's air-quality ambition (including adoption of the 2021 WHO guidelines), strengthening monitoring and public alerting (with priority around schools, hospitals and care homes), and improving enforcement of existing rules, especially engine-idling and delivery of Air Quality Action Plans (AQAPs) and LEZs. Organisations emphasise transport measures that shift travel to public transport and active travel, accelerate bus and train electrification, expand and police LEZs, and improve EV charging, alongside

targeted protection for vulnerable groups. There are also calls to tackle non-transport sources, domestic solid-fuel burning, industrial processes and agriculture (ammonia/secondary PM), through tougher standards, better regulation and public awareness. Several contributors highlight governance, funding and cross-agency partnership, plus improved technical guidance and more transparent, granular data.

Monitoring, data and public alerts

Multiple respondents call for expanded, more responsive monitoring with better siting protocols and coverage where vulnerable groups are present. Asthma + Lung UK Scotland proposes “PM2.5 monitoring stations in every community” and enhanced alerting so people with lung conditions, and frontline services (GPs, hospitals, schools, care homes), can act during high-pollution episodes. ESS recommends making the particulate network “more responsive to the changing pattern of emissions sources” and commissioning independent assessments of emerging hotspots; it also urges scrutiny of NO_2/PM siting protocols, especially “in and around our major cities.” ERCS argues that limited, reliable data, exacerbated by loss of EU-wide comparators, weakens efforts to meet WHO guidelines and calls for increased transparency and public access to data. The RCPE points to portable sensors and school-based “citizen science” as promising tools. Fife Council describes piloting school-site monitoring with diffusion tubes and portable AQ monitors. City of Edinburgh Council asks for national guidance to ensure robust and consistent approaches to measuring LEZ/public-health impacts.

Enforcement, compliance and governance

ERCS prioritises effective enforcement of existing legislation, beginning with Scotland’s idling ban, recommending updated guidance to encourage fines as the first enforcement step, better publicity, extended enforcement powers for parking attendants, and reinstatement of local authority reporting duties. They also seek strengthened AQAPs with “specific and measurable timeframes” and expert scrutiny, with councils held to account if plans are outdated or unimplemented. Professor Gemmell similarly stresses a need for “real policing” of AQMAs, existing LEZs and idling requirements, alongside stronger regulatory efforts. The City of Edinburgh Council praises the minister-led LEZ governance structure and suggests deploying similar arrangements for other major interventions under a new CAFS strategy.

Transport: modal shift, LEZs, buses/trains, EVs and freight

Respondents emphasise cutting car use through affordable, reliable public transport and high-quality active travel. The RCPE notes that improving public transport is the “most successful” strategy for reducing car travel and underlines the safety and uptake benefits of protected cycle routes. NASUWT also highlight the need to expand clean and inexpensive public transport systems alongside investment in active transport.

ERCS urges a faster modal shift consistent with the 20% car-kilometre reduction commitment, expansion of LEZs to more cities (and larger zones), and parallel affordability measures (e.g., using charges on the most polluting vehicles to support low-income groups). Asthma + Lung UK Scotland also proposes implementing LEZs in further cities and expanding their boundaries, accelerating bus/train electrification, and using Transport (Scotland) Act 2019 powers to create affordable council-run bus services in underserved areas. The RCPE calls for schemes to electrify school buses and taxis, and for moving freight from road to rail to cut emissions.

RCPE and Asthma + Lung UK Scotland recommend stronger purchase incentives for EVs (including second-hand EVs) and better charging e.g. council-owned chargers with near-home-tariff pricing and mandated bay provision for flats. Asthma + Lung UK Scotland proposes annual audits to identify gaps in the EV-charging network.

Communities Against Woodsmoke asks to stop “train engine idling” at major indoor stations. ERCS wants stronger idling enforcement (first-offence fines, extended powers, reinstated reporting) and strengthened AQAP accountability.

Non-transport sources

ESS advises expanding focus beyond transport to industrial processes, residential/other combustion and agriculture, given their significant contributions to PM. The City of Edinburgh Council calls for stronger agricultural policies to cut ammonia (a precursor to secondary PM) and better alignment of Pollution Prevention and Control permit standards with tighter Scottish air quality objectives. Professor Campbell Gemmell highlights muirburn and the rising “frequency, scale and impact” of wildfires as important PM and toxics sources, urging planning, fuel management, warning/forecasting, and healthcare preparedness “especially for vulnerable groups.”

Several respondents want tighter controls on domestic burning. Fife Council seeks “stricter restrictions on the installation of wood burning stoves and biomass boilers” and more research on indoor air pollution and source apportionment. ERCS supports strengthened ventilation rules, especially in schools, hospitals and care homes, and strengthening the Heat in Buildings (Scotland) Bill to prohibit new polluting stoves while accelerating the switch from gas/oil boilers. Asthma + Lung UK Scotland calls for “a ban on the sale of the most polluting fuels,” a nationwide scrappage scheme for inefficient wood burners, and refreshed Smoke Control Area legislation. Communities Against Woodsmoke urges prohibiting garden-waste burning, restricting stove sales/use where not necessary for heat, and applying health warning labels to stoves/firepits/chimineas, arguing these products emit many of the same hazardous chemicals as cigarettes. It recommends a public-health campaign, citing local authority examples such as Brighton’s “Cosy Killer” and contends that, given existing scientific evidence, “it is clear… woodburning causes localised peaks of PM2.5,” so more street/village monitors are not needed in such areas.

Protecting vulnerable groups and place-based action

Professor Gemmell urges policy to reduce exposure (not only emissions) for babies and children, pregnant women, older people and those with chronic conditions, via planning, streetscape and green-barrier choices. The RCPE suggests “low traffic areas round hospitals, care homes and schools,” school-site “tredges” (trellised hedges with hairy-leaved plants), and avoiding busing to school where possible by planning for “30-minute schools.” ERCS and Asthma + Lung UK Scotland both seek prioritised monitoring and alerts around sites for vulnerable groups.

NASUWT note that air pollution due to traffic is also a major issue in some schools. They have been campaigning for HEPA filters to remove pathogens, allergens and contaminants and make a better learning experience with reduced absence. They said that “it is likely that a filter would pay for itself very quickly by reducing absence rates, as well as improving learning” and point to a causal link between air pollution and pupil test results. NASUWT highlight 6 asks they have of Governments including legal asks such as enshrining a right in legislation to breathe clean air and updating health and safety law to reflect current research. They also call for air pollution to be recognised as an occupational health issue and for employers to be required to raise awareness and support workforce training on risks and control measures.

Communications and public engagement

The RCPE stresses that, because pollution is “invisible,” effective engagement matters; providing facts can overcome vocal opposition to measures like LEZs. It cites signage showing real-time pollution levels (e.g., near schools) that reduced idling in Australia, and finds that making activities enjoyable improves understanding and “behaviour change intent.” ERCS proposes a national awareness campaign with clear health advice, online publicity for idling offences, and transparency/access to air-quality data. Communities Against Woodsmoke seeks a Scotland-wide health campaign on wood-smoke risks.

Policy integration, funding and governance

The City of Edinburgh Council supports embedding air-quality actions across Local Development Plans, climate and transport strategies, and exploring “Zero-Carbon City Centres” (potentially linked to LEZs and including power/heating). It also requests clarity on freeports’ emissions/regulation and calls for committed funding to help councils deliver interventions, decarbonising public transport, improving parking policy and encouraging active travel. SEPA underscores the need for cross-cutting partnership delivery and notes it is supporting the Scottish Government on WHO/EU updates and compliance analysis and that it will continue assisting with CAFS2 implementation and development of the long-term framework.