

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

The petitioner 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 and fine particulate matter which align with the 2021 World Health Organisation air quality guidelines.

### Air quality and health

Poor air quality is a major threat to human health. The [World Health Organisation \(WHO\) state](#) that by reducing air pollution, countries can reduce the burden of disease from stroke, heart disease, lung cancer, and chronic and acute respiratory diseases including asthma.

Elevated pollution levels, often located in urban areas with high volumes of road traffic [are associated with a number of health issues](#), in particular respiratory and cardiovascular diseases. [Health Protection Scotland estimate](#) that approximately 1,700 premature deaths in Scotland annually are attributable to air quality issues ([studies have put the range of estimated annual deaths as high as 2,700 per year](#)). [Research has also shown](#) an association between prenatal exposure to air pollution and developmental delay, as well as psychological and behavioural problems later on, including attention deficit hyperactivity disorder (ADHD), anxiety and depression.

The Scottish Government published a '[Review and Assessment of the Evidence on Health Impacts of Low-Level Pollution in Countries with Levels of Ambient Air Pollution Comparable to Scotland](#)' in 2023. The review states that overall, the evidence shows "the broad range of impacts from air pollution and the necessity to mitigate the harmful health effects of air pollution", and that "As these harmful effects have been extensively evidenced at concentrations below national and international air quality standards, effective policies and interventions are necessary to reduce air pollution levels".

### World Health Organisation Air Quality Guidelines

[WHO Air Quality Guidelines](#) (AQG) offer global guidance on thresholds and limits for key air pollutants that pose health risks. They are recommendations (not legally binding standards) of limit values for specific pollutants based on literature reviews, evaluation and consultation on the most up to date evidence on air quality and associated health impacts. The guidelines were first released in 1987 and there have been several updates, the most recent in 2021. The Guidelines provide global

limit values for Particulate matter (PM)- particles of solids or liquids including dust, dirt, soot, smoke etc, nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>) and carbon monoxide (CO). The following table shows the recommended 2021 AQG levels compared to the previous 2005 guidelines.

Pollutant	Averaging Time	2005 AQGs	2021 AQGs
PM <sub>2.5</sub> , µg/m <sup>3</sup>	Annual	10	5
	24-hour <sup>a</sup>	25	15
PM <sub>10</sub> , µg/m <sup>3</sup>	Annual	20	15
	24-hour <sup>a</sup>	50	45
O <sub>3</sub> , µg/m <sup>3</sup>	Peak season <sup>b</sup>	-	60
	8-hour <sup>a</sup>	100	100
NO <sub>2</sub> , µg/m <sup>3</sup>	Annual	40	10
	24-hour <sup>a</sup>	-	25
SO <sub>2</sub> , µg/m <sup>3</sup>	24-hour <sup>a</sup>	20	40
CO, mg/m <sup>3</sup>	24-hour <sup>a</sup>	-	4

µg = microgram <sup>a</sup> 99th percentile (i.e. 3–4 exceedance days per year). <sup>b</sup> Average of daily maximum 8-hour mean O<sub>3</sub> concentration in the six consecutive months with the highest six-month running- average O<sub>3</sub> concentration. Note: Annual and peak season is long-term exposure, while 24 hour and 8 hour is short-term exposure. [Source: WHO](#)

The [WHO states that Governments can use the guidelines](#) “in different ways depending on their technical capabilities, economic capacity, air quality management policies and other political and social factors. Before adopting the WHO guideline values as legally based standards, governments should consider their unique, local conditions”.

## Air quality in Scotland and the Clean Air for Scotland Strategy

Sources of air pollution in Scotland are distributed across many sectors, including transport, agriculture, energy industries and domestic (household) sources. The petitioner focuses on air pollution from road transport. The two air pollutants in the petition, nitrogen dioxide (NO<sub>2</sub>) and fine particulate matter (PM<sub>2.5</sub>), are [two key pollutants when considering the impact of road transport on health](#). NO<sub>2</sub> is produced in an internal combustion engine and PM<sub>2.5</sub> can include particles from combustion, engine abrasion, brake pads and tyres e.g. soot, heavy metals, silica and rubber.

Key legislation setting air quality limit values is [the Air Quality \(Scotland\) Regulations 2000](#) (as amended) and [the Air Quality Standards \(Scotland\) Regulations 2010](#). Current standards in Scotland for NO<sub>2</sub> and PM<sub>2.5</sub> are based on 2005 AQGs - 40 µg/m<sup>3</sup> for NO<sub>2</sub> and 10 µg/m<sup>3</sup> for PM<sub>2.5</sub> (as annual averages – there are additional standards for peak levels). [The 2021 AQGs halved the annual average limit value for PM<sub>2.5</sub> to 5 µg/m<sup>3</sup> and quartered the NO<sub>2</sub> limit value to 10 µg/m<sup>3</sup>](#) (with suggested reductions to 30 µg/m<sup>3</sup> as ‘interim target 2’, and 20 µg/m<sup>3</sup> as ‘interim target 3’, to provide a pathway from 40 µg/m<sup>3</sup>).

In 2016 Scotland was the first country in Europe to adopt the (WHO guideline value for PM<sub>2.5</sub> of 10 µg m<sup>3</sup> as an annual mean into domestic law.

The Scottish Government published [Cleaner Air For Scotland 2 Towards a Better Place for Everyone](#) (CAFS2) in 2021. It is the second national air quality strategy, following a consultation in 2020 and [an independent review of the first strategy in 2019](#).

CAFS2 sets out that although no figure has been calculated for the combined impact of PM<sub>2.5</sub> and NO<sub>2</sub> attributable deaths, evidence suggests that around 2,000 attributable deaths annually may be a reasonable number.

CAFS2 sets out policy commitments across 10 themes, which include adopting a **precautionary public health approach** to air pollution reduction, and as such efforts should be made to go beyond legal compliance.

Under the Environment Act 1995 and associated regulations, all Scottish local authorities are required to regularly review and assess air quality in their areas against objectives for several air pollutants of concern for human health. Data on local air quality, supplied by local authorities, can be found on the [Air quality in Scotland website](#). More information on how air quality is regulated including roles of public bodies, [is set out in a SPICe briefing](#).

## **Environmental Standards Scotland air quality investigation (and Scottish Government Improvement Plan)**

In [September 2022, Environmental Standards Scotland \(ESS - Scotland's environmental standards watchdog\) published an Air Quality Investigation Improvement Report](#) which investigated arrangements in place in Scotland to meet statutory limits for NO<sub>2</sub>. Whilst it did not make an explicit recommendation regarding WHO guidelines, it concluded that there were significant weaknesses in systems to improve air quality with respect to NO<sub>2</sub> and made a number of recommendations for improvements. Those included that the Scottish Government should revise CAFS2 “to include specific and measurable timescales (consistent with the overarching duty to achieve compliance within the shortest time possible) for when compliance with NO<sub>2</sub> limit values should be achieved”.

The [Scottish Government set out in its Air Quality Improvement Plan, published March 2023](#) (required by law in response to an Improvement Report by ESS), that it accepted that recommendation, but did not reference any plans to update limit values to align with WHO 2021 guidelines.

## **Asthma and Lung UK Scotland 2024 report**

In [September 2024, Asthma and Lung UK Scotland \(the petitioner\) published a report, Clearing the Air: Transport + Lung Health](#), which set out information on how air pollution impacts people's health and health inequalities in Scotland; air pollution levels and how those are monitored; and a series of recommendations. Its key findings included that all automatic air quality monitoring stations were within the current legal limits for NO<sub>2</sub> and PM<sub>2.5</sub> in 2023, but less than half of those sites would meet the WHO 2021 guidelines for PM<sub>2.5</sub> and just over two-thirds would meet the 2021 guidelines for NO<sub>2</sub>. The report includes ten recommendations – the first is that

the Scottish Government should introduce legislation to adopt the 2021 WHO guidelines.

In [response to a Parliamentary Question on 24 October 2024](#) asking the Scottish Government what its response was to the recommendations in this report, the acting Cabinet Secretary for Net Zero and Energy, Gillian Martin MSP said regarding WHO guidelines that “the review of Cleaner Air for Scotland 2 will consider the current air quality objectives. The 2021 WHO guideline values will be a factor in our considerations.”

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