The British Heart Foundation is the nation’s leading heart charity. In the fight for every heartbeat we fund ground breaking medical research, provide support and care to people living with cardiovascular disease and advocate for change. Since 2010, The BHF has provided £3.2 million for medical research to better understand how air pollution impacts the heart and circulatory system.

We would like to take this opportunity to thank the Environment, Climate Change and Land Reform Committee of the Scottish Parliament for the opportunity to respond to this public consultation. The British Heart Foundation has been working across the United Kingdom to raise awareness of the negative impact that air pollution can have on cardiovascular health. We are pleased that the Scottish Government has shown their commitment to improving air quality throughout the country through the development of the Cleaner Air for Scotland Strategy and we are delighted to be part of the conversation about improving air quality policy further.

Air Pollution and Cardiovascular Disease

Globally, 80% of deaths related to outdoor air pollution are due to heart disease or stroke.¹

In Scotland, public exposure to air pollution is most likely to come from traffic sources. The majority of research regarding air pollution and health has focused on how fine particles can lead to cardiovascular disease, and there is now enough evidence to support a causal link.²,³,⁴ Studies suggest that traffic pollution is specifically associated with cardiovascular risk due to the high level of fine and ultrafine particulate matter emitted⁵. The association with cardiovascular disease and exposure to particulate matter (PM) is strongest for exposure to PM$_{2.5}$ and ultrafine particles derived from diesel vehicle exhausts.⁶,⁷ Long-term exposure to PM$_{2.5}$ is strongly linked to heart attacks and angina due to the fine and ultrafine particulate matter from vehicles that are able to penetrate deep into the lungs and into the bloodstream.⁸

BHF Scotland recommends that reducing vehicle emissions is the most effective way to improve air quality. The priority for the Scottish Government should be to reduce traffic in the most polluted areas. This this will have a beneficial impact on cardiovascular health in Scotland, ultimately saving lives.

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² Committee on the Medical Effects of Air Pollutants (2009) ‘The mortality effects of long-term exposure to particulate air pollution in the UK.’
⁷ ibid
Air Pollution: A Public Health Emergency

BHF Scotland recognises that the levels of air pollution have decreased over the years, however in many areas it is still breaching safe limits set by the WHO and the Scottish Government themselves. WHO describes air pollution as “a public health emergency” and “the biggest environmental risk to health, carrying responsibility for about one in every nine deaths annually [at a global level]”. All local authorities across Scotland should ensure they are taking appropriate measures to tackle poor air quality as soon as possible.

Does Scotland have the right polices (Clean Air for Scotland Strategy), support and incentives in place to adequately tackle air pollution?

BHF Scotland supports the following policies as outlined by the Cleaner Air for Scotland Strategy in order to reduce emissions from traffic pollution and recommend that implementation of any of the policies outlined below would improve cardiovascular health.

- The introduction of Clean Air Zones (CAZs) across the UK would provide a population level change in road use in the UK’s urban centres. CAZs have been proven to dramatically reduce NO₂ and particulate emissions, especially the finer particles which are known to damage heart health. These zones should discourage diesel motorists from driving their vehicles into highly polluted and highly populated urban areas.

- Investment in Ultra-Low Emissions Vehicles (ULEVs) and supporting the transition from combustion engines to ULEVs would have a positive impact on poor air quality. BHF supports the investment that Scottish Government have made available in public charging infrastructure and financial incentives to address the main issues that currently deter people from purchasing these vehicles.

- Active Travel is a way of encouraging the public to replace car journeys with cycling or walking. A reduction in the number of car journeys taken will have a positive impact on air quality. The potential health impacts of physical exercise are outweighed by the risks to health cause by air pollution.

Another initiative which has been launched following the Cleaner Air for Scotland Progress Report 2016 is an online air quality reporting tool (scottishairquality.com). This website provides a useful tool for monitoring air pollution and to assess periods of high pollution throughout the day. However, it compares current air quality data to the Scottish daily limit guidelines. Cardiovascular risk is associated with both long-term and short-term exposure to air pollution. Efforts should be made to ensure that at risk groups are aware if they reside in an area which air pollution is consistently high compared to longer-term limits.

In addition, we do not believe, however, that the advice of the Air Quality in Scotland website is currently reaching the population as widely as is needed. Current systems place the onus on individuals to understand the health impacts of pollution and rely heavily on online technology for this information. We would like to see this system improved to ensure advice reaches down to the community level and is easily accessible to the population as a whole.

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How does the Scottish policy fit with the UK and EU policy on air quality?

The Scottish Government have made Scotland the first country in the EU to enshrine World Health Organisation guideline values for PM$_{2.5}$ into law.

Scotland should retain the commitment to adhere to these stricter regulations in order to protect the health of members of our society - particularly the most vulnerable. Air pollution is a transboundary issue therefore Scotland should continue with their commitment to improving air quality and should encourage the rest of the UK and other EU countries to do the same.

Scotland, as with the rest of the UK, has fallen behind other EU countries with the introduction of Clean Air Zones (CAZs). Scotland currently has no Clean Air Zones whereas Germany has over 50. Evidence from Germany has shown that CAZs have the potential to tackle poor air quality in a given location\(^{11}\).

**Are the policies sufficiently ambitious?**

While Scotland are leading the way in adopting stricter guidelines than their UK and EU counterparts it is important that these limits are not only adhered to but improved on, given that there is no proven safe limit for particulate matter. The vast majority of deaths relating to PM$_{2.5}$ exposure are in areas within the legal limits.\(^{12}\) The BHF support the Scottish Government’s position to conform to WHO standards, but they should not become complacent and always strive to minimise PM levels, even if this falls well below the WHO guidelines.

NO$_2$ and PM$_{10}$ will be used as a proposed KPI for the success of the CAFS Strategy, PM$_{2.5}$ levels also do not feature as a KPI used to monitor progress of the CAFS. BHF Scotland are concerned that PM$_{2.5}$ is not being used as a KPI of the Cleaner Air for Scotland Strategy given how important it is for cardiovascular health that these levels are reduced.

BHF Scotland is also concerned that the Scottish Government has decided to increase the PM$_{10}$ guideline limit from 18 µg/m$^3$ to 20 µg/m$^3$.\(^{13}\) In a 2013 Review of Local Air Quality Management in Scotland, the Scottish Government addressed the issue of raising the PM$_{10}$ limit in line with WHO standards, but stated that increasing the PM$_{10}$ limit was a backwards step and “implies that the Scottish Government affords low priority to the issue”\(^{14}\).

At the same time the Scottish Government should be praised for decreasing the PM$_{2.5}$ limit by 2 µg/m$^3$ to comply with WHO guidelines. As previously stated, there is no safe level concerning PM and the risk of heart disease. The more stringent PM$_{10}$ level should be retained if the Scottish Government considers public health and reducing cardiovascular disease as a priority.

The CAFS strategy outlines many proposals for tackling air pollution; however the commitment to introducing only one Low Emission Zone by 2018 is insufficient to improve the cardiovascular health of the public. It is appreciated that the initiatives can be difficult or costly to implement, however the air quality in the worst affected areas are repeatedly

\(^{11}\) German Partnership for Sustainable Mobility (2014) Clean Air – Made in Germany p.26


\(^{14}\) Consultation On Review Of Local Air Quality Management In Scotland – Analysis Of Responses (2013)
breaching regulation levels. Given the immediate public health emergency that air pollution causes, the cost for implementation should not be considered a barrier due to the saved costs to healthcare and social care following cardiovascular events attributed to air pollution.

Are the powers and resources of Local Authorities and SEPA to address air pollution adequate?

It is currently not possible for many local authorities to commit to maintaining a WHO guideline level of PM$_{2.5}$. This is because there are comparatively few monitors to assess PM levels compared to those which assess NO$_2$ levels. Given that it is known how the presence of PM$_{2.5}$ can have both short-term and long-term impacts on cardiovascular health$^{15,16}$, it is extremely important to know where levels of particulate matter are high in order to take urgent action to reduce it.

While BHF Scotland recognises in the CAFS Strategy that there is a commitment to introduce more PM$_{2.5}$ monitors, the Scottish Government should make a commitment that all major urban areas monitor all forms of pollution, including particulate matter, as a public health priority.

Are the policies and delivery mechanisms (support and incentives) being effectively implemented and successful in addressing the issues?

It is unclear if policies and delivery mechanisms are being effectively implemented because the policies supported by BHF Scotland as outlined in the CAFS strategy have yet to be implemented.

Implementation of policies to improve air quality will be more successful if there is greater public awareness of the increased risk of cardiovascular problems related to air pollution. People are more likely to support new initiatives to improve air quality if they are aware that efforts to reduce air pollution will have beneficial impact to their own health.

How should the improvement of air quality be prioritised in areas where there have been persistent breaches of NO$_2$ limit values?

The areas where NO$_2$ emissions are at their highest are in urbanised areas. The urban population is particularly exposed to traffic emissions as these are relatively close to the ground and in the near vicinity of housing$^{17}$. Therefore efforts to improve air quality should be prioritised to these areas. According to Defra, in areas where the UK is exceeding air quality limits, around 80% of roadside NO$_2$ concentrations are due to road transport and only 3% from industry$^{18}$. Schemes such as Low Emission Zones, Promotion of Ultra Low Emission Vehicles, and the introduction of Active Travel, have been discussed previously and would reduce vehicle emissions in these areas. These schemes should be implemented as a priority in areas where there have been persistent breaches of NO$_2$ limit values.

In addition, areas where there are high levels of inequality must also be prioritised. This is because our most deprived communities are exposed to some of the worst outdoor and indoor air quality, contributing to the gap in life expectancy of nearly 10 years between the most and the least affluent communities.\(^{19}\)

Where there are persistent beaches in NO\(_2\) limit values, there must also be a commitment to begin measuring PM concentrations in these areas if this is not already being done.

BHF Scotland would like to thank the Environment, Climate Change and Land Reform Committee for the opportunity to input into this consultation. If the Committee would like to clarify or request more information please do get in touch via the contact details below.

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\(^{19}\) Royal College of Physicians (2016) Every breath we take: the lifelong impact of air pollution. London RCP, available at [https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution](https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution)