Clean Air – are we in the zone?

Associate Professor Cllr Beverley Nielsen works for the Institute for Design, Economic Acceleration & Sustainability (IDEAS) at Birmingham City University and is a Senior Fellow at the Centre for Brexit Studies. She is co-editing a book on the *Green Economy* ***with Dr Steve McCabe, due to be published this summer, and is an Expert Commissioner for the All Party Parliamentary Group on Green Manufacturing.***

As Birmingham 'soft launched' its Clean Air Zone (CAZ) at the start of June 2021, aiming to restrict high-emission vehicles' (HEV) movements and charge non-conforming private cars and commercial vehicles from 14 June, it's worth considering the evidence of harm caused by poor air quality and just how effective clean air zones around Europe have been.

Birmingham is the second city in the country to implement a 'full' clean air zone with London introducing its Ultra Low Emission Zone (ULEZ) following its initial Clean Air Zone and associated congestion charges launched in 2008. Bath introduced a less restrictive CAZ on commercial vehicles on 15 March 2021, with York launching the country's only voluntary CAZ in January 2020, applying to buses alone.

Whilst CAZ introductions have been relatively slow across the UK, the pace is gathering and industry body, BVRLA amongst others, has produced guidance on where further cities are planning launches along with start dates. However, there are many cities across Europe which have introduced Clean Air and Low Emission zones as they look to clean up inner city air quality, reduce particulate material (PM) emissions and noxious gases, with evidence of the impact of these considered below.

The issue of air quality has become particularly pressing in the UK since the tragic death in 2013 of nine year old, Ella Adoo-Kissi-Debrah, who lived near the South Circular Road in Lewisham, south-east London and was the first person in the UK to have air pollution listed as the cause of her death.

An initial inquest into Ella's death took place in 2014. The coroner ruled that Ella had died of 'acute respiratory failure caused by severe asthma', with no reference to air pollution. This verdict was overturned five years later, following expert evidence compiled by Professor Stephen Holgate, demonstrating 'big spikes' in air pollution around Ella's home at the time leading up to her death. Human rights lawyer, Jocelyn Cockburn took on the family's case, asserting breaches of Article 2 of the European Human Rights Convention by the government in denying Ella her right to life.

A subsequent inquest took place in December 2020. This time, Coroner Phillip Barlow emphasised there was "no safe level of particulate matter" in the air and called for reductions to national pollution limits. Government needed to reduce the existing legally binding targets for particulate matter pollution and bring them in line with World Health Organisation (WHO) guidelines, he stated.

Professor Holgate, in giving evidence at this inquest, called on government to "start to treat this with the seriousness that it deserves". Having previously stated that there was "a real prospect that without unlawful levels of air pollution Ella would not have died," he added, "if this was happening to water and 40,000 deaths were being brought forward due to poisoning in water, we'd be outside Parliament shouting."

Whilst the Fifth Report on Air Quality produced by the Environmental Audit Committee highlighted research by the European Environment Agency indicating that there could be as many as 50,000 premature deaths in the UK due to poor air quality, further research published in the BMJ highlighted that fossil fuel air pollution was responsible for around one in five deaths, more than double previous estimates. Researchers calculated that 8.7 million people worldwide died in

2018 from breathing in air containing particles from burning fuels including coal, petrol, and diesel, aggravating respiratory conditions like asthma and leading to lung cancer, coronary heart disease, strokes, and early death.

With the evidence of harm resulting from poor air quality, the government currently faces further legal challenges seeking a review of air quality targets, in particular, following evidence linking severe Covid-19 cases to air pollution.

The latest challenge, being brought by the Good Law Project, Mums for Lungs, the UK Climate Coalition, and Students for Global Health, draws on evidence from studies including analysis by Harvard University, suggesting high levels of air pollution can raise the risk of dying from Covid-19 and is the latest in a long line of legal battles by campaigners intended to force the Government to take action to improve air quality.

With WHO guidelines targeting PM2.5 emissions at under 10 micrograms per cubic metre of air (µg/m3) while the UK limit, based on European Union (EU) recommendations, allows a yearly average of 25 µg/m3, or more than twice recommended WHO limits, campaigners are concerned at breaches in even these standards.

So what is the evidence of the impact on air quality made by Low Emission Zones? Cllr Waseem Zaffar, Cabinet Member for Transport and Environment at Birmingham City Council, in launching the Birmingham CAZ, was keen to emphasise the health benefits, stating, "I'm confident that this initiative will save lives, and provide a cleaner, greener, safer space for our communities in a part of our city that has a problem with poor air quality." Does the evidence back up his claims? It seems it does.

Research, published in Science Direct and conducted in London in 2013, found that in the first five years of the Clean Air Zone, particulate matter had fallen by between 2.5% and 3.1%, compared with 1% outside the zone.

A study in 2015 looking at the impact of Low Emissions Zones introduced across 25 cities in Germany with 3.96 million inhabitants and published in Science Direct, indicated significant reductions in $PM_{10,}$ with significant health benefits for affected populations, indicating in one instance a 9% reduction in PM10 in a LEZ area.

In Holland, a 2012 study found that Low Emission Zones restricting heavy goods vehicles in five Dutch cities had not made a substantial difference compared with areas outside of LEZ. However, this study concluded that this was very likely as a result of the rules being too limited to make enough difference to the amount of traffic flow. Nonetheless, this study did in fact also demonstrate that in the case of $PM_{2.5}$, reductions were considerably higher on urban streets (30%) and urban background locations (27%) than at matching suburban control locations (20%) outside the LEZ. In one urban street where traffic intensity was reduced by 50%, NO_x and NO_2 concentrations were reduced substantially more (41, 36 and 25%) than at the corresponding suburban control location (22, 14 and 7%).

To mark the launch of Birmingham's Clean Air Zone a harmless black smoke was released from the viewing platform and roof of the Library of Birmingham, to represent average NOx savings anticipated following the introduction of the Clean Air Zone.

From June 14 owners of non-compliant vehicles without a valid exemption entering the Birmingham Clean Air Zone will be required to pay a daily fee of £8 for cars, taxis, and large goods vehicles (LGVs), and £50 a day for coaches, buses and HGVs. Failure to pay will lead to an additional fine of

up to £120, on top of any unpaid charges and is reduced to £60 if paid within 14 days. This is in contrast with Bath where taxis, trucks and vans (including pick-up trucks), pay £9 to enter the city centre if they're non complaint, whilst trucks and buses pay £100 to enter the zone if they do not meet emissions standards.

The AA has has highlighted that an estimated 100,000 vehicles – 23% of those licensed within Birmingham – will be affected and has lobbied for expansion of park and ride schemes, removal of VAT from electric vehicles, amongst other measures supporting those with polluting vehicles.

But Birmingham has already built in considerable exemptions, such as for those living within the Clean Air Zone with a vehicle registered to their address enabling applicants to trigger up to two years exemption from payment after the CAZ launches. These exemptions can apply to people's private or company cars as well as to lease vehicles.

The AA, however, proposes that Clean Air Zones should also offer first-time warnings for drivers of non-compliant vehicles rather than charging them, especially for those visiting destinations including the Birmingham Children's Hospital, located inside the Birmingham CAZ.

With further zones planned for Bristol, Bradford, Portsmouth, Greater Manchester, Newcastle, Gateshead and North Tyneside, and London's Ultra-Low Emission Zone (ULEZ) due to be extended again in October 2021, residents, commuters and businesses, will need to adapt as we all get into the zone.