

All I Need Is The Air That I Breathe – To Be Clean!

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I'm very pleased to have been asked to chair the [Northern Air Quality Conference on 25th May](#) being held at the Midland Hotel, Manchester. There's a great line up including Dr Maria Neira of the World Health Organisation, Polly Billington of UK100, Sarah Woolnough CEO at Asthma UK and the British Lung Foundation, Imogen Martineau of the Clean Air Fund and Professor Laurence Jones of the UK Centre for Ecology & Hydrology.

As a cyclist this is a subject which is close to my heart. You become very aware of vehicles' exhaust emissions. Even the newer ones can emit unpleasant fumes which seem to unreasonably sully the air around you.

These emissions are just one part of this toxic picture. Over a period of time these pollutants have a malign effect on our vital organs including lungs, heart and brain and are associated with asthma, lung cancer, heart disease, strokes, dementia, depression and anxiety. They even affect concentration levels in young children.

For me this is a problem we need to discuss more, partly as it leads to premature deaths – every year, up to [64,000 of all premature deaths](#) are associated with air pollution, with up to 40,000 premature deaths linked to exposure to particulates and nitrogen dioxide.

It's a costly problem too. The [Environment Food and Rural Affairs Committee](#) noted in February 2021 that health problems caused by air pollution are costing society around £20bn a year.

Internationally the World Health Organization (WHO) quotes air pollution as [the biggest environmental health risk in the world](#), with a study cited in [the BMJ](#) showing that fossil fuel air pollution is responsible for around one in five deaths – more than double the number previously thought. This estimated that 8.7 million people worldwide had died in 2018 as a result of breathing in air containing particles from burning fossil fuels.

Recently, the tragic death of nine year old, Ella Roberta Adoo Kissi-Debrah in 2013 raised the consequences for both children and adults with the Coroner concluding in December 2020 that Ella had “died of asthma contributed to by exposure to excessive air pollution”. Medical causes of death were listed as, “acute respiratory failure”, “severe asthma” and, for the first time, “air pollution exposure”. He stated that during the course of her illness this little girl had been exposed to levels of nitrogen dioxide and particulate matter well in excess of WHO guidelines, with the principal source of her exposure down to traffic emissions.

For me, I'm particularly concerned about air quality and emissions now for these principal reasons:

1. Failure to regulate Non-Exhaust Emissions (NEE) with too rigid a focus on tailpipe emissions
2. Failure to set clear air quality targets in the 2021 Environment Act
3. Concerns over the powers and remit of the new Office for Environmental Protection

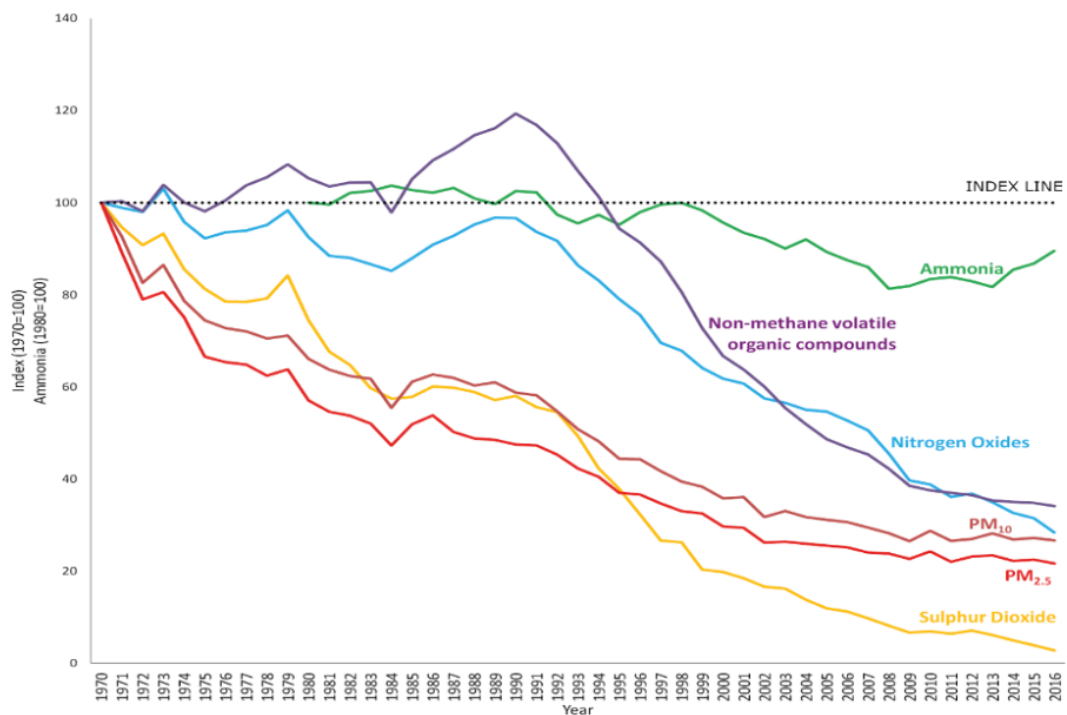
And of course I very much agree with the recommendations in a [report by MPs on the Environment, Food and Rural Affairs Committee published in February 2021](#) which also highlighted the need to

urgently address health inequalities with further research into the links between poor air quality and Covid-19, along with addressing poor air quality around schools.

In light of all this, it seems there's a pressing need to roll out more Clean Air Zone options to deliver better air quality in urban areas driving integrated transport solutions.

Whilst some air pollutant emissions have reduced (as can be seen from the chart below) nitrogen oxides and particulate emissions have not declined fast enough. Vehicle emissions previously regulated by Euro emissions standards, now incorporated into UK law, define acceptable limits for exhaust emissions, but, notably, these do not include tyre emissions, a growing source of PM emissions.

Trends in UK emissions 1970–2016

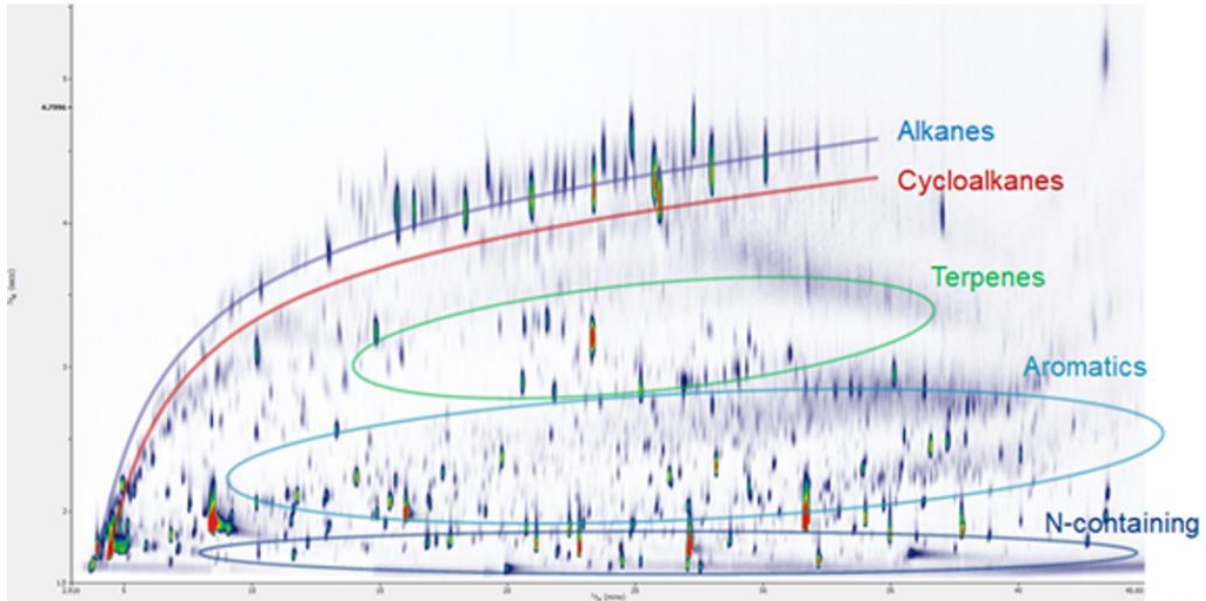


The index line is a comparator that shows the level of emissions if they had remained constant from the beginning of the time series.

Clean Air Zones, introduced to drive better air quality standards in urban environments, have certainly helped to raise the focus on air quality in our cities but these too are focussed purely on exhaust emissions. The Birmingham Clean Air Zone introduced in June 2021 has seen 20% falls in [nitrogen dioxide levels](#) when compared to the same period in both [2019 and 2020](#) but as a note by the Defra Air Quality Expert Group points out, there is [no legislation currently in place aimed at limiting or reducing Non-Exhaust Emissions \(NEE\)](#).

Data from the UK National Atmospheric Emissions Inventory indicates that particles from brake wear, tyre wear and road surface wear make up 60% and 73% (by mass) of PM_{2.5} and PM₁₀ emissions from road transport and that these will become more dominant in the future.

Some research by [Emissions Analytics](#) used a gas chromatograph to identify compound emissions resulting from tyre abrasion as shown in the illustration below.



These include alkanes affecting lungs, liver, kidney and the brain. Cycloalkanes lead to headaches and dizziness. Terpenes are generally less problematic whereas aromatics, such as benzo(a)pyrene, are often noted as carcinogens, as are nitrogen-containing compounds such as quinoline.

[As a party](#) to the Gothenburg Protocol, the UK is subject to national emissions ceilings for sulphur dioxide (SO₂), nitrogen dioxide, volatile organic compounds (VOCs), ammonia (NH₃) and PM_{2.5}. These are translated into UK law as annual emissions reductions targets via the National Emission Ceilings Regulations 2018.

The EU Air Quality Directive, along with other EU air quality legislation sets “limit values” on the levels of permissible outdoor air pollution which must not be exceeded. Whilst now incorporated into UK retained law, since Brexit, the European Commission is no longer able to enforce these limits through the European Court of Justice.

Prior to leaving the EU, Client Earth took the UK government to the Court of Justice of the European Union, winning their case over the government’s failure to protect the UK public from toxic air pollution. The Court [ruled](#) on the UK’s ‘systematic and persistent’ failure to stay within legal limits for dangerous nitrogen dioxide since 2010 and its failure to put plans in place to tackle the problem in the shortest possible time.

Client Earth, having already taken government to Court and won in the UK three times previously, commented on this failure stating that it was ‘passing the buck to local authorities’ whilst highlighting the role of Clean Air Zones in reducing nitrogen dioxide levels as ‘the most effective solution’

Since leaving the EU the Office for Environmental Protection, to be set up as part of the new Environment Act, is due to become the central institution holding the UK government to account for breaches of its environmental responsibilities.

Whilst campaigners (and the House of Lords) recently promoted WHO air quality guidelines as a minimum to be formalised in the Environment Act, this was resisted by government, with no firm targets included in the Act and questions remaining over whether the Office for Environmental

Protection will have sufficient independence, authority and resources to secure genuine improvements in environmental and public health standards.

Rather than setting the targets in the Act itself, the Act looks to [empower the Secretary of State to set long-term air quality \(and other environmental\) targets](#). There is also a specific requirement for the Secretary of State to set a shorter-term legally binding target to reduce PM2.5 in ambient air, together with draft regulations to be put before Parliament by 31 October 2022, on at least two air quality targets, one on PM2.5, with another long-term target.

This complex and time-consuming approach is rather reminiscent of the recent fiasco over raw sewage discharges into rivers and the government's last minute U-turn in creating a duty on water companies requiring them by law to 'show a reduction in sewage overflows over the next five years' rather than banning this practice outright.

In raising the profile of air pollution and the impact it has on all our lives we're talking about the health and well-being of our population as whole, our environment and the legacy we leave to our children and their children. Now is surely the time to monitor and target not only exhaust emissions but non-exhaust emissions, to ensure clear targets are set in monitoring air quality and to deliver an Office for Environment Protection that can properly control those involved. Using Clean Air Zone options are already delivering improvements providing case studies for the willing to follow.

To improve air quality local authorities have been setting up Clean Air Zones (CAZ). There are various types of CAZ – charging and non-charging – and four classes – [A, B, C and D](#), with each class covering a different variation of potentially polluting vehicles including buses, coaches, private hire vehicles, HGVs and LGVs. 'D' is the only class to include cars and each local authority is able to decide for itself what level of restrictions to apply.

A number of cities have recently introduced these – some as required by government. A useful article by [Motoring Research](#) covers current and anticipated zones, explaining the differences between the various Classes as well as between CAZ, Ultra Low Emission Zones and Zero Emission Zones.

In Worcester, the city closest to where I live, we have an [Air Quality Management Area](#) in place. Green City Councillors brought forward a Notice of Motion to deliver more investment in air quality monitors across the city but this was blocked. In one built up area of the city in a narrow street that gets congested at peak times, restrictions have been put in place banning cars between 3.30pm and 6.30pm. In a bid to trigger further action, Green Councillors are calling for real-time monitoring of air quality through the day so motorists and residents can see actual levels of pollution across the city. But crucially this approach does not deliver any revenue stream empowering cities to take further steps to ameliorate the impact of poor air quality – active mobility corridors, more Demand Responsive Transport, Community Transport, car shares, bikes, scooters and further greening of our urban environment.

[The Green Alliance report on the Case for Clean Air Zones](#) highlights the modelled and real impacts in our cities. For example, Birmingham's impact assessment found that the health and environmental benefits for 2020 alone equating to over £50 million. Modelling work by Bristol in 2019 demonstrated the financial benefits of a CAZ D as being five times greater than those of a CAZ C. London's ULEZ achieved the following in its first ten months:

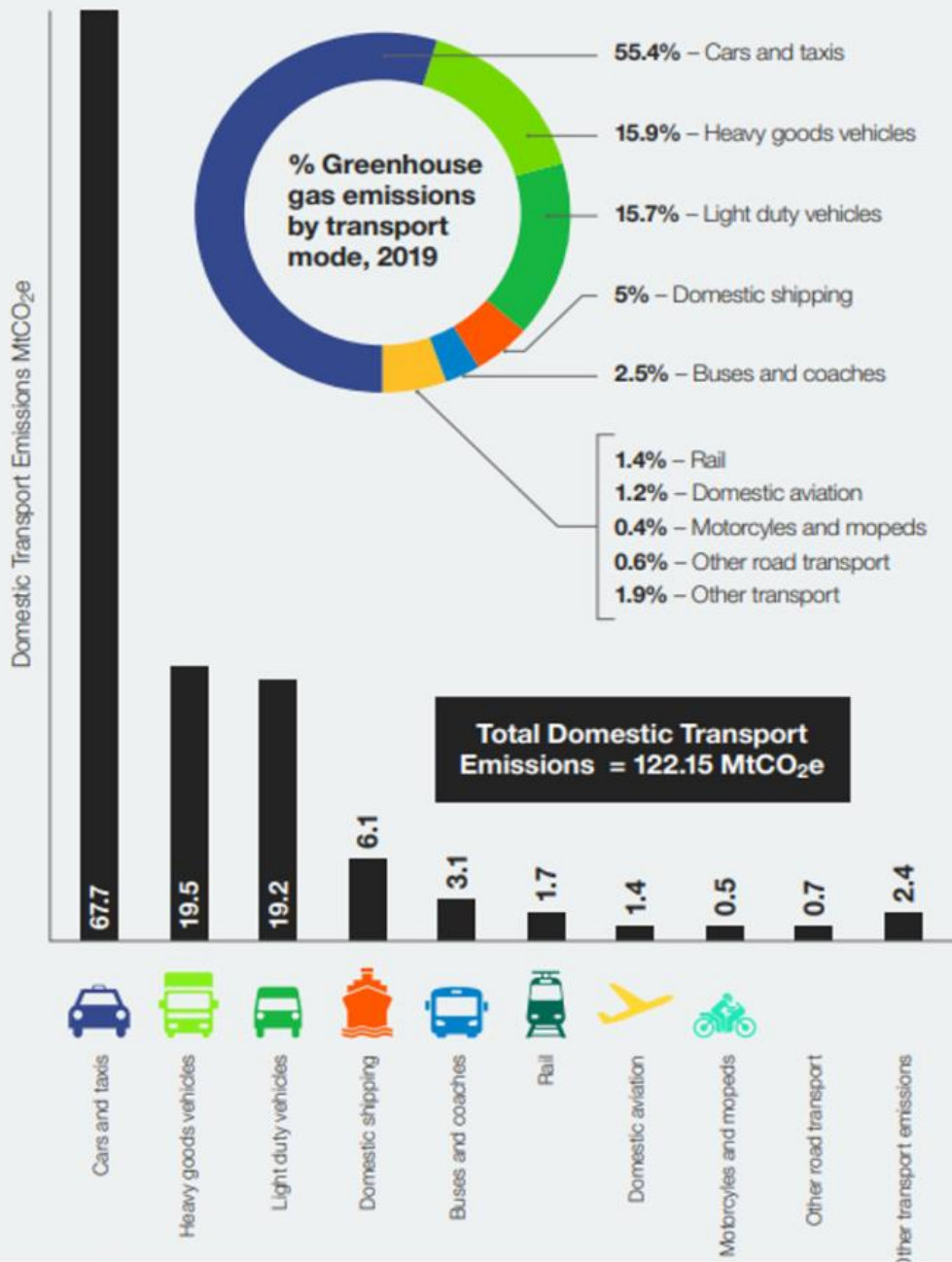
- * 37% per cent reduction in NO2 concentrations at central London roadsides
- * 35% reduction in NOx emissions from road transport in the central zone
- * 6% fall in CO2 emissions from road transport in the central zone

* 3 to 9% fall in traffic flows in central London

* 49% reduction in non-compliant, more polluting vehicles, equivalent to 17,400 vehicles, detected in the zone.

Given the pressure on government to improve air quality, other towns and cities are anticipated to introduce further variations on clean air zones to suit their circumstances. Clean Air Zones may well be a means to stimulate integrated transport hubs, such as those seen in European cities and providing greater choice in terms of mass transit options for residents, linking alternative modes together in providing ease of transport interchange and as a means of facilitating a real alternative to the car, responsible for almost 70% of total greenhouse emissions, as shown below.

UK domestic transport emissions 2019⁶



[Department for Transport: Decarbonising Transport, A Better, Greener Britain \(2021\)](#)