

Working draft as at 20 April 2008

An introduction to Air Quality issues in London

‘Unlimited and free access to clean air of an acceptable quality is a fundamental human necessity and right’ and ‘an unequal distribution of health risks over the population raises concerns of environmental justice and equity’ “Health aspects of Air Pollution”

Published by WHO Europe, June 2004. See <http://www.euro.who.int/document/E83080.pdf>

What is the Campaign for Clean Air in London?

The purpose of the cross-party Campaign for Clean Air in London (CCAL) is to achieve urgently and sustainably at least World Health Organisation (WHO) recommended standards of air quality throughout London. See: www.cleanairinlondon.org.

CCAL is supported by leading politicians of all the four main political parties in London, including Sian Berry and Ken Livingstone, as well as all the amenity societies in Central London and leading business groups including the Central London Partnership, London First and The Knightsbridge Business Group. It has also received a pledge of support from Environmental Protection UK (formerly the National Society for Clean Air). CCAL operates under the auspices of The Knightsbridge Association (www.knightsbridgeassociation.org.uk).

With such broad support, we do not always all agree on everything but we do all agree that we must achieve urgently ‘Clean Air in London’.

Air pollution in London is much worse than most of us have realised

Air pollution in London is much worse than most of us have realised with consequences for air quality and climate change (primarily CO₂).

There are three main types of hazardous air pollution: particulate matter (for example very fine particles from dust, tyre and brake wear and black smoke from vehicles), nitrogen dioxide (NO₂) and street level or tropospheric ozone (O₃). NO₂ is broadly correlated with PM₁₀ although the latter is increased by high levels of diesel powered vehicle use (predominantly trucks and commercial vehicles). Particulate matter is classified by size as ultrafine (PM_{1.0}), fine (PM_{2.5}) and coarse (PM₁₀). The finest is thought to be the most deadly since it travels furthest into the bloodstream and the body.

Air pollution near many of London’s busiest roads (such as Marylebone Road, Kings Road and Brompton Road) averages annually well over twice (even three times for NO₂ in Marylebone Road so far in 2008) the WHO’s maximum recommended levels. This compares with China, say, where air pollution can be over three times the WHO’s maximum recommended levels across large parts of the biggest cities.

Click on the **Statistics** tab of the excellent London Air Quality Network where each red dot indicates an actual or expected breach of the United Kingdom (UK) Government’s Air Quality Strategy Objectives:

<http://www.londonair.org.uk/london/asp/publicstats.asp?statyear=2011>

Bear in mind that the monitoring sites shown rarely measure the full range of air pollutants and they may be sited several hundred metres from the worst local “hotspots”. One “Roadside” monitoring station sits in a bush in the Wildlife Garden of the Natural History Museum.

The WHO recommends a maximum number of peak average hourly (for NO₂) and daily (for PM₁₀) exposure levels to protect human health from short term peaks of air pollution e.g. shoppers, those sitting in roadside restaurants and others. Already, in the first 15 weeks of 2008 [to 18 April], Marylebone Road, Kings Road and Brompton Road have experienced 209, 42 and 147 hours respectively of NO₂ over 200 micrograms per cubic metre (µg/m³) compared to the maximum recommended number of 18 hours only for a whole year i.e. breaches are taking place ‘daily’ instead of ‘monthly’.

Transport for London’s consultation document on the Low Emission Zone (LEZ) stated that some 1.37 million people would be exposed to more than the WHO’s maximum recommended annual mean for NO₂ in 2008 and still 625,000 people by 2012 unless further action was taken (such as the LEZ).

A recent European Environment Agency (EEA) report called “Air pollution in Europe 1990-2004” stated in its overall Executive Summary that “Ambient concentrations of particulate matter and ozone in the air [in Europe] have not shown any improvement since 1997 despite the decrease in emissions. This might be due to meteorological variability and growing long- distance transport of pollutants”.

The evidence from the summer smogs of 2003 and 2006 is that air quality will deteriorate as climate change causes warming unless additional mitigation action are taken that anticipate this rising trend.

Does it matter that air pollution in London is this bad?

Absolutely, yes, it does.

Some 1,031 people are estimated to have died from one form of air pollution alone, called particulate matter, in London in 2005. This grim statistic is more than four times the number of people (i.e. 230) who died in London in the same period from road traffic accidents. It compares also with the 617 people annually who are estimated to have died prematurely from workplace related passive smoking nationally before the recent legislation came into force.

<http://www.bmj.com/cgi/content/full/330/7495/812>

According to a recent WHO report, the UK has the second highest death rate in Western Europe from particulate matter after The Netherlands. London has the worst air pollution in the UK.

http://www.who.int/quantifying_ehimpacts/countryprofilesebd.xls

The European Commission estimates that some 370,000 people per annum die prematurely across Europe from air pollution of which around 350,000 are due to particulate matter. This equates to an average loss of life of some nine months. In some Member States, the average for a whole country is one to two years.

<http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/108&format=HTML&a>

[ged=0&language=EN&guiLanguage=en](#)

Bear in mind that the average includes all those who live in clean air and those who live where air pollution is below WHO maximum recommended levels. One report suggested that pollution in London could reduce [some] lifespans by up to 10 years.

http://www.dailytimes.com.pk/default.asp?page=story_14-6-2004_pg6_13

Medical research published in The Lancet on 17 February 2007 found that children in southern California who lived within 500 metres of a freeway (motorway) had substantial deficits in 8-year growth of lung function compared with children who lived more than 1,500 metres from a freeway.

<http://www.thelancet.com/journals/lancet/article/PIIS0140673607600373/abstract>

Bear in mind that many Londoners live within 500 metres of busy main roads.

During London's summer smog episode in August 2003 there were a total of between 46 and 212 premature deaths from O₃ and 85 from particulate matter.

http://www.airquality.co.uk/archive/reports/cat09/0401130931_heatwave2003.pdf

London's summer smog episode in July 2006 was likely to have resulted in a similar or greater number of premature deaths from O₃ and a slightly lower number for particulate matter. These numbers should be of great concern to those planning for the Olympic Games and Paralympic Games in 2012.

The deadly dangers of PM₁₀ and O₃ are well known but NO₂ is the other most dangerous air pollutant facing Londoners. Furthermore, one of the main reasons that strict legal standards are set for NO₂ air pollution is that, apart from its own toxic properties, it is a proxy for many other dangerous air pollutants that occur with it – i.e. the so-called nitrogen oxides (NO_x) that are generated by traffic fumes. NO₂ is particularly dangerous for the old and the young.

The United States' Environmental Protection Agency website lists the Health and Environmental Impacts of NO_x as including:

- (i) Ground Level Ozone (Smog)
- (ii) Acid Rain
- (iii) Particles (i.e. particulate matter)
- (iv) Water Quality Deterioration
- (v) Climate Change
- (vi) Toxic Chemicals
- (vii) Visibility Impairment

Of these, Ground Level Ozone (Smog) is formed when NO_x and volatile organic compounds react in the presence of sunlight. Children, people with lung diseases such as asthma and people who work or exercise outside are susceptible to adverse effects such as damage to lung tissue and reduction in lung function. Particles are created when NO_x reacts with ammonia, moisture and other compounds to form nitric acid and related particles. Human health concerns include effects on breathing and the respiratory system, damage to lung tissue and premature death. Toxic Chemicals are created in

the air when NO_x reacts readily with common organic chemicals and even ozone to form a wide variety of toxic products, some of which may cause biological mutations (examples include the nitrate radical, nitroarenes and nitrosamines).

In summary, air pollution is linked to: a thickening of the blood which leads to strokes and heart attacks; respiratory problems such as asthma; cancers; and other health effects.

What causes bad air pollution?

The Government says that all UK breaches of the European Union's (EU's) legally binding standards for air quality (EU Limit Values) are due to road traffic.

Road transport was responsible for 67% of PM₁₀ emissions and 41% of NO_x emissions in London overall in 2003. It is likely that this will rise significantly near busy roads. In broad terms, road traffic causes around 50% of air pollution and over 75% of it in so called "street canyons" where high buildings close the road in (and EU Limit Values are most often breached). It is not about vehicle size in itself. Rather it is about the amount and type of fuel burnt. A small vehicle driven a lot can be as bad as a big vehicle driven a little.

The London Atmospheric Emissions Inventory (2003) has the latest data on the sources of emissions for London. It includes forecasts to 2010. An updated report is much needed:

http://static.london.gov.uk/mayor/environment/air_quality/research/emissions-inventory.jsp

Emissions from diesel engines are a particular problem. Like for like, EU emission standards allow diesel engines to emit some three times as much of the hazardous particulate matter and nitrogen oxides (NO_x) as petrol engines. The Air Quality Expert Group (AQEG) has predicted that diesel engines may produce up to 17% less CO₂, which is good for climate change, but over 65% more each of the hazardous NO_x and particulate matter than petrol engines. Empirical evidence suggests however that, like for like, diesel engines for passenger cars may produce as little as 4% less CO₂ but 17 times as much particulate matter and 83% more NO_x than petrol vehicles. The Government has subsequently confirmed this picture, saying that the diesel NO_x figures are probably too low and the HGV CO₂ figures too high on the basis of recent test data.

Details were given in a Ministerial answer on 25 June 2007:

<http://www.theyworkforyou.com/wrans/?id=2007-06-25e.145736.h>.

Diesel vehicles with Pre-Euro 1 engines may produce more than five times as much particulate matter as diesel vehicles with Euro 4 engines.

The other main sources of emissions include power stations, domestic natural gas, quarrying, construction and (outside London) agriculture. The proliferation of festival bonfires has also recently been recognised as a cause of more frequent air quality problems. Tables showing a detailed analysis of air pollution sources can be found in the AQEG's report "Air Quality and Climate Change": A UK Perspective":

<http://www.defra.gov.uk/publications/2011/04/13/pb13378-air-pollution/>

What are the likely solutions?

Lord Stern, the Intergovernmental Panel on Climate Change and the Air Quality Expert Group, sponsored by the Department for Environment, Food and Rural Affairs, have all made clear that Climate Change and Air Quality measures must be looked at together as two sides of the air pollution coin, not least to achieve cost savings.

Essentially, solutions split into two main categories:

- Non-traffic measures – such as complying with the Best Practice Guidance on Demolition and Construction published jointly by the London Boroughs and the Mayor of London. Other measures needed include action to control the impact of biomass burning and micro-generation and the proliferation of festival bonfires; and
- Traffic related measures – which can be split further into: Fewer and Smaller vehicles; and Cleaner vehicles. It is simplest to consider two overlapping circles: one for congestion measures and one for reducing emissions.

Measures to reduce congestion are important because vehicles typically emit half as much carbon dioxide and hazardous air pollutants at 20 miles per hour as they do at very low speeds. Road pricing is needed to reduce traffic volumes and increase speeds. CCAL considers that the Congestion Charge Zone (CCZ) is the bluntest form of road pricing (though it is clearly better than no road pricing in Central London). It would be wrong to compare just current and pre-CCZ congestion and traffic volumes for the CCZ without making allowance also for the considerable growth in vehicle kilometres in wider Greater London and the wider south east of England in the same period i.e. congestion in the CCZ would be much worse now, without it. CCAL considers though that “tag and beacon” road pricing must be offered in parallel with the CCZ so that drivers wishing to drive short distances outside busy times could do so at little or no cost. CCAL understands that such a scheme could be introduced quickly.

Measures to reduce emissions include the LEZ. The LEZ is intended to operate as a ban with escalating fines rather than as a charging mechanism. The LEZ requires vehicles to comply with Euro 3 and eventually Euro 4 emissions standards in respect of particulate matter only i.e. an older vehicle can meet the standard by fitting an appropriate particulate trap. The LEZ has no plan currently to require Euro 3 or Euro 4 standards for the emissions of nitrogen oxides. The latter point is important because CCAL considers that such a failure is evidence that the Government is not making the efforts required to satisfy the pre-conditions for a time extension from the EU Limit Values for NO₂ in January 2010. Euro 4 engines produce about half as much of the hazardous air pollution as Euro 3 engines. Other measures needed include a new Taxi Emissions Strategy. It is unlikely that London will be able to comply with air quality laws until, at least, old diesel vehicles are banned from the most polluted parts of the city. Already, there are many LEZs around Europe: <http://www.lowemissionzones.eu/>.

Despite much confusion on this subject, it is obvious that these two circles (i.e. congestion and emissions) must overlap to ensure an holistic approach to air pollution. For example, by excluding some vehicles the LEZ may reduce congestion. And the CO₂ Charge, if implemented, may reduce congestion and/or emissions. Measures to promote walking, cycling and the use of public transport clearly reduce both congestion and emissions.

Most importantly, a plan is needed for London (and the UK) that will prioritise sufficient measures that the EU Limit Values for PM₁₀ and NO₂ will be met by the due deadlines. There is no

point being “busy fools” and pursuing measures that sound “good” but achieve little. The best measures will create a “tipping point” that will lead to rapid reductions in congestion and improvements in air quality. The bottom line for any air quality strategy to be credible is for it to answer the following question: “When will the AQ standards be met and how?”

It is clear that the Government has continued to hope for some “silver bullet” to resolve the air quality problem e.g. tighter emission standards for vehicles. Worse still, the Government has adopted an arbitrary cost-benefit approach instead of a compliance approach to air quality laws. Both must change: solutions will require political will and widespread behavioural change. If air quality laws cannot be complied with now, what chance is there that Climate Change Bill and EU-wide required reductions in CO₂ will be achieved by 2020?

Does the law protect us against poor air quality?

Yes. Since 1999, European Union legislation has been in force requiring the UK, as a Member State, to achieve annual average and daily average EU Limit Values for PM₁₀ (by January 2005) and annual average and hourly average EU Limit Values for NO₂ in London (by January 2010). These are based on WHO maximum recommended levels of air pollution. While objectives are set, there are no EU Limit Values for O₃ since it is considered to be a transboundary problem (although there are other obligations for O₃ e.g. on health warnings).

The EU Limit Values for PM₁₀ were breached in London in 2005, 2006 and 2007. There is no plan yet to achieve the EU Limit Values for NO₂ by January 2010. With no derogations allowed from these legally binding obligations, the European Commission could have taken the UK to the European Court of Justice, after two written warnings, to seek enforcement and, eventually, unlimited fines for non-compliance. For details of the level of possible fines, see:

http://ec.europa.eu/eu_law/infringements/infringements_en.htm

However, with many European countries joining the UK in failing to comply with EU Limit Values for PM₁₀ by January 2005 and no legal framework for allowing time extensions, a new “EU Directive for ambient air quality and cleaner air for Europe” (new AQ Directive) has been negotiated since late 2005. The new AQ Directive was finally adopted by the EU on 14 April 2008 and it will enter into force in May 2008 on the day it is published in the EU’s Official Journal. See the European Commission’s press release dated 14 April 2008:

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/570&format=HTML&aged=0&language=EN&guiLanguage=en>

In practice, subject to meeting certain pre-conditions, the new AQ Directive will allow Member States to apply for time extensions to meet the existing EU Limit Values for PM₁₀ until mid-2011 and the existing EU Limit Values for NO₂ until January 2015 – provided the European Commission approves a plan that will result in these deadlines being met i.e. measures are planned that will ensure the EU Limit Values will be met (with a downward trajectory of air pollution levels with most due to be achieved by January 2012).

As far as CCAL is aware, no such plans currently exist. It plans therefore to press the European Commission later this year to grant time extensions for PM₁₀ only if convincing plans are produced that will clearly result in the new deadlines being met throughout London. In respect of

the EU Limit Values for NO₂, CCAL considers that the UK Government is failing to meet the pre-conditions that would allow it to obtain any time extension beyond January 2010. The Government has failed to develop a national strategy for the abatement of emissions of nitrogen oxides (e.g. whether for older vehicles or power stations), which would set technology and testing standards, justifying the omission on the grounds of it adopting a “technology neutral” stance. CCAL cannot see any justification for the Government having taken this stance and has already made that point formally to the European Commission.

While the new AQ Directive places the obligations on the UK as a Member State, the Government has sought to pass duties onto the Mayor of London and in turn to individual boroughs that must declare an Air Quality Management Area when it looks as though EU Limit Values are not being met.

London and the UK Government have given undertakings separately under the Host City Contract that all work necessary for the planning, construction and operation of facilities for the Olympic and Paralympic Games will be fully compliant with local, regional and national regulations, international agreements and protocols in relation to environmental protection.

Please remember that Environmental Justice should guarantee a basic human right of free access to clean air of acceptable quality. This means that individuals in air pollution hotspots have no less right to clean air than anyone else.

Please read a Campaign Update from CCAL published on 12 December 2007 titled “Conditional support for new EU air quality laws” which gives considerable detail of air quality laws, including the new AQ Directive. It explains thoroughly the significance of January 2012 as a realistic final backstop date for the Government, supported by the Mayor of London, to achieve finally and sustainably the EU Limit Values for NO₂ and PM₁₀ throughout London. See:

<http://cleanairinlondon.org/legal/clean-air-in-london-gives-conditional-support-to-new-eu-air-quality-directive/>

Next steps

Radical environmental action is needed urgently since just one of the many obligations of the new AQ Directive will require the UK to achieve air quality standards for PM₁₀ throughout London, by mid-2011 at the latest, that were breached, in London, in each of 2005, 2006 and 2007. In the very broadest terms, air pollution near London’s busiest roads must be halved before the 2012 Olympic and Paralympic Games.

We need measures that: are ambitious and anticipate the adverse impact of climate change on air pollution generally; make full use of available technologies; are cost conscious while still focussing on the need to meet legally binding deadlines; and will be implemented in a timely manner that will also give as much notice as possible of the changes coming to those affected.

The new AQ Directive establishes a clear framework for the meeting of air quality obligations. The time extension process for PM₁₀, and for NO₂ in due course, will provide almost annual tests in the next few years of the resolve of the European Commission and the UK Government in respect of air quality and air pollution.

London's political leaders should engage fully and constructively in this process. Given the sheer scale of policy measures that will need be implemented in the next term of office, they should set out all the key policies they would pursue to ensure that air quality laws will be complied with throughout London by the deadlines known now. London's political leaders should do this before the elections so the electorate can make informed decisions on 1 May 2008.