

Air Pollution

The Policy in Brief

Over the last 10 years the Labour Government has failed to make any progress towards meeting the European air pollution targets set up to protect public health. In London Conservative Mayor Boris Johnson is guilty of making numerous policy errors which are pushing the targets further from reach; in particular his plan to suspend Phase 3 of the London Low Emission zone.

Figures uncovered by the Liberal Democrats show that over 24,000 premature deaths are caused by air pollution, in the UK every year. Over 4,000 people a year die prematurely in London alone due to air pollution: this is four times the figure claimed by Mayor Livingstone in February 2008. Air pollution reduces the life expectancy of every person in the UK by an average of 7-8 months with an equivalent health cost of up to £20 billion each year.

Liberal Democrats are committed to ensuring the UK complies fully with air quality laws for dangerous airborne particles and Nitrogen Dioxide by the 2012 Olympics. We are calling on the Government to take immediate steps to meet the 2005 and impending 2010 European Air Quality targets. These steps include shelving plans for a third runway at Heathrow.

Key Statistics/Quotes

- In a recent report by the European environmental agency¹ in 2005 into PM₁₀ showed that the UK has 650 deaths per million people over 30.
- There were 34 different areas in the UK where relevant air quality laws were breached between 2005 and 2007²
- The Rogers Review estimated that in 2005 the annual cost to the UK of health problems caused by just one form of air pollution, PM₁₀, was between £9.1 billion and £21 billion.³

¹ <http://www.eea.europa.eu/publications/spatial-assessment-of-pm10-and-ozone-concentrations-in-europe-2005-1>

² http://ec.europa.eu/environment/air/quality/legislation/pdf/pm10_exceedances_2005_07.pdf

³ http://archive.cabinetoffice.gov.uk/rogersreview/upload/assets/rogersreview/rogers_review_2007.pdf page 59

Why is it Necessary

A recent World Health Organisation report⁴ indicates that intervention to combat air pollution could reduce total deaths in European regions by 20%. The report also estimates that there are 101,335 deaths each year in the UK due to environmental factors such as air pollution, occupational factors, ultraviolet radiation and the built environment.

The major air pollutants include: dangerous airborne particles (PM₁₀), a toxic gas nitrogen dioxide (NO₂), and Ozone (O₃). NO₂ is also often an indicator of worse air pollutants being present e.g. polycyclic aromatic hydrocarbons (PAHs) which are potentially carcinogenic given prolonged exposure. (Appendix one)

Particulate Matter (PM) is the term used to describe particles that are suspended in the air. Particles may be solid or liquid and are one of the most obvious forms of pollution as they are visible in the hazes that cover a city or region.

PM₁₀ is the term used for particulate matter 10 microns (1 /10th of the size of a human hair) or smaller in the air.

The main sources of primary PM₁₀ are road transport (all road transport emits PM₁₀, but diesel vehicles emit much more particulate matter per vehicle kilometre), stationary combustion (domestic coal combustion has traditionally been the major source of particulate emissions in the UK) and industrial processes (including bulk handling, construction, mining and quarrying). Air transport is also increasingly responsible for PM₁₀.

Most of the studies conducted in Europe suggest that **Nitrogen Dioxide (NO₂)** is also strongly related to hospital admissions or emergency department visits for asthma.

Studies in California and the Netherlands suggest that the elderly and children are the most vulnerable to health problems as a result of poor air quality. Lung growth in children exposed to higher levels of pollutions can be decreased, leaving them in adulthood with 70-75% of average lung capacity.⁵

Diesel emissions, particularly from older vehicles, are the biggest problem in our large towns and cities and yet the government has done next to nothing to highlight it.

Deaths related to PM₁₀

Poor air quality is much worse for health than is recognised by the public at large. Poor air quality has serious implications for public health, causing between 24,000⁶ premature deaths each year in the UK. However, other reports suggest UK premature death numbers could be as high as 51,537⁷ (See Appendix two for comparison of research papers). Those with asthma, lung diseases and heart conditions are the most susceptible.

⁴ http://www.euro.who.int/envhealth/data/20070831_4

⁵ <http://www.guardian.co.uk/politics/2009/feb/04/london-emissions-mayor>

⁶ <http://www.eea.europa.eu/publications/spatial-assessment-of-pm10-and-ozone-concentrations-in-europe-2005-1>

⁷ http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2008_13_HealthImpact_AirPoll.pdf page 35 table 3.4

The latest European Environment Agency Report⁸ suggests around 650 premature deaths of people aged 30 years of age or older in the UK in 2005 due to the presence of PM₁₀ alone. Some research suggests that these numbers may underestimate the full extent of the health problem.

Compare this with some 617 premature deaths per annum from workplace-related passive smoking before recent legislation came into force⁹ and up to 22,000 premature deaths per year from alcohol consumption¹⁰.

Research suggests a life years lost of 9.8 years/victim. This equates to an average of 0.6 years across the total population (7.2 months).

Aside from the terrible human cost, the economic case for action was made in the government's own Air Quality Strategy in 2007. Here it states that 'policies to reduce air pollution in the road transport sector and electricity sector have been shown to be very cost beneficial with benefits estimated to have exceeded costs by up to a factor of 24'.

The Rogers Review estimated that in 2005 the UK's annual cost of health impacts from just one form of air pollution, PM₁₀, was between £9.1 billion and £21 billion.¹¹

Current PM10 Situation

The UK is in breach of the annual average and daily limit values for PM₁₀. There were 34 different areas where relevant air quality laws were breached in the UK from 2005 to 2007¹². The UK also breached air quality laws for PM₁₀ in 2008.¹³

http://ec.europa.eu/environment/air/quality/legislation/pdf/pm10_exceedances_2005_07.pdf

2007 Daily Breaches included:

Greater London Urban area; West Midlands Urban area; Brighton Worthing and Littlehampton; Southampton; Glasgow; Swansea; Gibraltar

⁸ <http://www.eea.europa.eu/publications/spatial-assessment-of-pm10-and-ozone-concentrations-in-europe-2005-1>

⁹ <http://www.bmj.com/cgi/content/full/330/7495/812#TBL1> 2003 BMJ

¹⁰ <http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/caboffice%20alcoholhar.pdf>

¹¹ http://archive.cabinetoffice.gov.uk/rogersreview/upload/assets/rogersreview/rogers_review_2007.pdf

¹² http://ec.europa.eu/environment/air/quality/legislation/pdf/pm10_exceedances_2005_07.pdf

¹³ <http://www.londonair.org.uk/london/asp/publicstats.asp?region=0>

Case Study London

(In a similar way to London we can extrapolate data for other UK Cities with Air Quality breaches using Population figures Office of national statistics¹⁴)

Greater London has a population over 30 years of 4,469, 000. If its citizens suffer the same average exposure to air pollution as found elsewhere this means there could be around 2,905 premature deaths each year. ¹⁵

Research suggests life years lost of 9.8 years per victim equating to an average of 0.6 years across the total population (i.e. 7.2 months). ¹⁶ However, recent research suggests central London the average reduction of life expectancy across the total population is 11 months¹⁷ and not 7.2 averages as rest of country¹⁸ i.e. amounting to 4,438 premature deaths each year.

4,438 premature deaths is greater than previous research that concludes around 3,000 premature deaths suggested by London Assembly Environment Committee and only 1,031 premature deaths stated by Mayor Livingstone.¹⁹

A detailed map of London roads breaching PM₁₀ limits can be found at:

<http://www.cleanairinlondon.org/attachments/3862679/PM10%20London%20maps%20080812.pdf>

Further detailed research is done through the London air quality network

<http://www.londonair.org.uk/london/reports/AirqualityinLondon2005.pdf>

Low Emission Zone

More than 70 cities and towns in 8 countries around Europe already have Low Emission Zones in place, or are preparing to launch. 'Low Emission Zones' (LEZs) are areas where the most polluting vehicles are regulated in some way. Vehicles may be banned or in some cases charged if they enter the LEZ and their emissions are over a set level.

Transport for London's consultation for the Low Emission Zone showed that some 1,392,000 people were affected by breaches of EU legal limits for particulate matter in 2005 and that, without further action, this number could be 96,000 in 2012 and still 46,000 in 2015.

¹⁴ <http://www.statistics.gov.uk/statbase/Product.asp?vlnk=15106> Mid-2007 UK Table 9

¹⁵ Ratio of 11/7.2 months) = 1.5278 applied to 650 per million population = 993.0 x 4.469 (London population over 30) = 4437.965

¹⁶ With reference to the research: **Assessment of Deaths Attributable to Air Pollution**: Should We Use Risk Estimates based on Time Series or on Cohort Studies. Kunzli et al 2001

See page '1054' i.e. second last page which refers to 'the amount of time lost, per statistical victim, turned out to be 9.8 years, which corresponds to a change in life expectancy of approximately 0.6 years in the total population'. Note: 0.6 years is 7.2 months.

<http://aje.oxfordjournals.org/cgi/content/full/115/11/1050>

As referenced in the European Environment agency report

<http://www.higher-solutions-for-your-health.com/support-files/studieabgasesundheit.pdf>

¹⁷ http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2008_13_HealthImpact_AirPoll.pdf See London Case study

¹⁸ http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2008_13_HealthImpact_AirPoll.pdf See London Case study

¹⁹ http://www.london.gov.uk/view_press_release.jsp?releaseid=15533

On the 4th February 2008 Ken Livingstone, the then Mayor of London introduced a Low Emission Zone in London. It is the first scheme of its kind in the UK due to London's air pollution being worse than any other city in the UK. Its stated aim was to deter the most polluting diesel-engined lorries, buses, coaches, minibuses and large vans from the city.²⁰

The Mayor of London, Boris Johnson, announced in February 2009 his intention to suspend the third phase of the London Low Emission Zone.²¹

European Commission Response to UK Air Quality Situation

The European Commission started legal action against the UK on 29 January 2009 for breaching limit values for PM₁₀ in 2005, 2006 and 2007 when it sent the UK a Letter of Formal Notice (i.e. a first written warning).²²

This action followed the failure by the UK to comply with the deadline of 31 October 2008, set by the Commission on 8 July 2008, by which to submit a notification for a time extension in respect of meeting the target for PM₁₀ (as the UK is allowed to do under Article 22 of the new AQ Directive).²³

The UK had until late March 2009, yet to reply to the Letter of Formal Notice after which time the Commission could send a Reasoned Opinion (i.e. a second and final written warning to the UK).²⁴

Usually two months thereafter the Commission may ask the European Court of Justice (ECJ) for a judgment against the UK. If the UK fails to comply with the ECJ's judgment, the Commission may ask the ECJ to impose unlimited lump sum and daily fines on the UK. These fines against the UK could total £300 million just in respect of PM₁₀.²⁵

PM10 European Regulations Extension

Until Friday the 24th April the UK had failed to submit a time extension notice to the commission. (There has been no response from the EU commission at time of publishing)

UK, Estonia, Slovenia and Sweden out of some 24 countries are the only countries that had made no effort to submit any time extension notification plans by the end of March deadline to the European Commission.

The UK does not appear to satisfy any of the pre-conditions for it to obtain a time extension to comply with limit values for PM₁₀: the First Condition (measures to achieve compliance by the initial attainment date) or the Specific Condition for PM₁₀ (site specific

²⁰ http://www.london.gov.uk/view_press_release.jsp?releaseid=15533

²¹ http://www.london.gov.uk/view_press_release.jsp?releaseid=20757

²² <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/174&format=HTML&aged=0&language=EN&guiLanguage=en>

²³ <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1112&format=HTML&aged=0&language=EN&guiLanguage=en>

²⁴ http://ec.europa.eu/community_law/infringements/infringements_en.htm

²⁵ http://www.cleanairinlondon.org/blog/_archives/2009/2/22/4101216.html

dispersion characteristics, adverse climatic conditions or trans-boundary contributions). These pre-conditions must be met if the UK is to obtain a time extension to comply with limit values for PM₁₀.

The UK has made no reasonable effort yet to satisfy the Second Condition – measures to achieve compliance before the new deadline. It has not been helped by its reliance on measures that the Mayor of London says he plans to suspend: vis-à-vis the phase 3 of the London Low Emission Zone and the extensions of the Low Emissions Zone.²⁶

Without the time extension any member of the public can presently take the UK government to court for breaches of PM₁₀ laws in 2005, 2006 and 2007.

Nitrogen Dioxide Health risks

The epidemiological studies provide some evidence that long-term NO₂ exposure may decrease lung function and increase the risk of respiratory symptoms. The Southern California Children's Study²⁷ showed that lung function levels among 9 to 16 year old children were lower in communities with higher NO₂ concentration. Lung function growth was also impaired among these children.²⁸

Two cross-sectional studies among children provide some evidence of an association between NO₂ and acute bronchitis, while the Southern California Children's Study suggested that chronic respiratory symptoms (cough and phlegm) were more frequent among children with asthma in communities with higher NO₂ exposure. Two cross-sectional studies found an association between NO₂ and cough and phlegm symptoms in adults.²⁹

Most of the studies conducted in Europe suggest that nitrogen dioxide is strongly related to hospital admissions or emergency department visits for asthma.

A U.S. study published in 2002 estimated that 30 percent of childhood asthma is due to environmental exposure, costing the nation \$2 billion per year. Studies also suggest that air pollution may contribute to the development of asthma in previously healthy people.³⁰

2010 Nitrogen Dioxide European emissions regulations

A recent Defra Consultation strategy on NO₂ UK Approach to its Application for Time Extension Notification to NO₂ Limit deadline concluded that numerous locations (most notably large urban centres, and Greater London), are projected to exceed the limit value

²⁶ <http://www.guardian.co.uk/politics/2009/feb/04/london-emissions-mayor>

²⁷ <http://www.arb.ca.gov/research/abstracts/94-331.htm>

²⁸ <http://www.euro.who.int/document/e79097.pdf> page 48

²⁹ MCCONNELL, R. ET AL. Air pollution and bronchitic symptoms in Southern California children with asthma. *Environmental health perspectives*, **107**: 757–760 (1999).

³⁰ <http://www.nrdc.org/health/effects/asthma.asp>

by a substantial extent. It may be that radical measures will be needed if all locations are to meet the limit value by 2015.³¹

The UK has proved unable to satisfy any of the three conditions for a time extension to comply with limit values for dangerous airborne particles (PM₁₀) in London and it is easy to foresee similar circumstances for NO₂. Urgent action is required if the UK is to avoid breaching health based air quality laws for nitrogen dioxide (NO₂) in London from 2010.

It is absolutely essential that the UK government submits urgently a wholly convincing plan for its time extension to comply with limit values for PM₁₀ (which it has not yet done) and as soon as possible for NO₂ (beyond January 2010). Several years of infringement action (and fines) from 2010 in the period up to the London 2012 Olympics would be likely to further undermine the UK credibility on keeping promises on air pollution laws.

Air Pollution and Heathrow

Hillary Benn, the Minister for the Environment told The Sunday Times: *"We have to achieve the environmental objectives. We have to honour that commitment and I am determined that we will . . . We have a problem with nitrogen dioxide around Heathrow, principally because of the traffic. Some of it is the aircraft."*³²

In a response to a parliamentary question the Government admitted that the expansion of Heathrow will result in a further 10.2 million road trips per year.³³

Against this background of government inaction and repeated disregard for deadlines concerning air quality, proposals for Heathrow expansion would look increasingly dubious.

The Greater London area accounts for the vast majority of excessive readings. This is because the London Boroughs experience high levels of traffic activity over a geographically constrained area. This contributes to both heightened background pollution levels across Greater London, as well as relatively high emissions from the roads themselves.

³¹ <http://www.defra.gov.uk/environment/airquality/panels/forum/documents/aq-forum-draft-no2-approach-paper0902.pdf>

³² <http://www.timesonline.co.uk/tol/news/politics/article5342576.ece>

³³ <http://www.publications.parliament.uk/pa/cm200708/cmhansrd/cm080312/text/80312w0013.htm#08031267003570>

Overview of predicted accidents of NO₂ annual mean limit value in zones and agglomerations in 2010 ³⁴

Zone/Agglomeration	2010 Road links	2010 Road length (km)	2015 Road links	2015 Road length (km)
Greater London Urban Area	1397	1117	802	520.5
West Midlands Urban Area	145	185	30	44.6
Greater Manchester Urban Area	211	206	36	37.0
West Yorkshire Urban Area	77	76	22	17.8
Tyneside	34	28	8	7.3
Liverpool Urban Area	70	49	9	2.0
Sheffield Urban Area	42	50	8	17.7
Nottingham Urban Area	27	22	2	2.0
Bristol Urban Area	17	11	1	0.5
Portsmouth Urban Area	7	9	1	1.9
Teesside Urban Area	11	12	5	5.4
The Potteries	14	16	9	10.1
Kingston upon Hull	14	20	5	8.0
Southampton Urban Area	6	11	1	1.7
Glasgow Urban Area	30	48	3	8.2
Belfast Metropolitan Urban Area	3	9	1	3.9
Zones				
Eastern	33	71	11	26.3
South East	37	81	3	6.2
East Midlands	22	42	2	4.0
North West & Merseyside	74	126	12	20.2
Yorkshire & Humberside	52	152	21	78.4
West Midlands	23	44	8	15.5
North East	21	31	6	6.9
Central Scotland	3	4	1	0.1
South Wales	9	20	1	1.3
North Wales	4	8	1	2.3
Other zones	48	40	-	-
TOTAL	2423	2496	1,009	849.5

UK breaches of NO₂ in 2008

http://www.airquality.co.uk/archive/data_and_statistics.php?f_exceedence_id=E1&f_year=2008&f_network_id=Array&f_group_id=2&f_region_reference_id=1&f_sub_region_id=9999&f_output=screen&f_parameter_id=NO2&f_action=exceedence3&f_go=Go

Air Quality maps of London

http://www.cleanairinlondon.org/_attachments/4107853/CCAL%20054%20Defra%20NO2%20maps%20for%20London%20in%202010%20and%202015.pdf

European NO₂ maps

http://www.esa.int/esaEO/SEM340NKPZD_index_0.html
<http://dataservice.eea.europa.eu/atlas/viewdata/viewpub.asp?id=3671b>

³⁴ <http://www.defra.gov.uk/environment/airquality/panels/forum/documents/aq-forum-draft-no2-approach-paper0902.pdf> page 13
 UK Approach to its Application for Time Extension Notification to Nitrogen Dioxide Limit Value deadline, Version 1.0, February 2009

This briefing has been produced by the Liberal Democrat Policy & Research Unit. You are advised to check the Lib Dem website (<http://www.libdems.org.uk>) for the latest developments. This briefing sets the Liberal Democrat approach to Government in

Westminster. It may not apply to policy in Scotland and Wales

Policy Detail:

We need a mixture of technology, behavioral change and political will. Evidence suggests that once people understand air quality issues most support action to improve it. There are big co-benefits e.g. climate change, quality of life, noise, costs savings.

It is a big problem with local, regional, national and international action needed. Only the Liberal Democrats have an active presence in the European Parliament (Note: Conservatives withdrawing), Parliament, London Assembly and in local councils. Only the Liberal Democrats can deliver on reducing air pollution.

- Liberal Democrats are committed to ensuring the UK complies fully with air quality laws for dangerous airborne particles PM₁₀ and NO₂ by the 2012 Olympics. We understand that European air pollution and emissions deadlines must be met whether to protect public health or prevent climate change.
- Liberal Democrats Call on government to also make a commitment to deal with NO₂ and PM₁₀ by producing and implementing a credible and robust plan. We also call on the Mayor of London to reconsider his efforts to tackle air pollution. Finally we urge Commissioner Dimas to ensure that the UK complies in full with the legal requirement to submit a credible plan to achieve the limit values for NO₂ as soon as possible.
- Liberal Democrats are committed to support research into the health effects of key air pollutants (e.g. ozone, PM, NO₂ and other gases for which NO₂ is an indicator e.g. PAHs) including their combined effect. We would also support a widespread information campaign to improve people's understanding of the dangers of poor air quality and the part they can play in improving it.
- Liberal Democrats would share responsibility for these targets with Local Government giving them appropriate and additional powers to support (smaller) LEZs to target pollution hotspots from road transport, and the strict adherence to air quality limits where supported by local residents. It is worth noting some 40 German cities will have such zones by the end of 2009.
- The reduction of emissions in the older public diesel fleet is vital. Furthermore we would invest in high speed electric rail networks and other public surface transport.
- Liberal Democrats would not build a third run way at Heathrow or other airports which would further reduce air quality. We would make sure all planning guidance will be used through existing legislation to take air quality impacts into account for all planning decisions.

Costs/Savings:

The fines against the UK could total £300 million just in respect of PM10

The Rogers Review estimated that in 2005 the UK's annual cost of health impacts from just one form of air pollution, PM10, was between £9.1 billion and £21 billion.

Labour:

Labour has failed to improve UK air quality in the last 10 years. Why believe the UK government when the UK is one of few countries subject to legal action for breaching air quality laws? The government and its medical advisers have consistently under-estimated the health impacts of poor air quality e.g. COMEAP 1998, 2001.

Legal standards were put into legislation in 1999 to protect public health; PM10 by January 2005 and NO₂ by January 2010. However, Levels of PM₁₀ have been static or rising over the last 10 years after earlier falls. There have been laws breached by the UK in 2005, 2006, 2007 and 2008 for PM₁₀.

Labour has failed to meet European Regulations and PM₁₀ targets for 2005, furthermore they plan to build third runway at Heathrow airport that will only increase the level of air pollution.

European Commission (EC) launched legal action against the UK in January 2009 for breaching air quality laws for PM₁₀ after UK missed EC deadline on 31 October 2008 to apply for a time extension. Only UK, Estonia, Slovenia and Sweden seem to have made no effort to comply with end March deadline set by the EC in January. UK submitted its application on 24th April 2009

NGO's are pressing EC to reject the UK's time extension notification on PM₁₀ – on the grounds it does not meet the pre-conditions for a time extension – unless the UK submits a more credible plan to reduce levels of PM₁₀ in London by June 2011.

Conservatives:

The Conservatives do not seem to grasp the importance of managing simultaneously the environment, social imperatives and the economy.

The Guardian reported in February 2009 that Boris Johnson has decision to suspend the next phase of the low emission zone (LEZ). This could leave more than 100,000 Londoners at risk of breathing in dangerously high levels of pollution.³⁵

The public knows that something is wrong and yet their concerns have been largely ignored by the government and Mayor Johnson. Seven out of ten Londoners say they are worried about pollution from traffic exhaust fumes. 66% of Londoners with asthma say traffic pollution aggravates their condition sometimes resulting in debilitating asthma attacks.

³⁵ <http://www.guardian.co.uk/politics/2009/feb/04/london-emissions-mayor>

Further References

The European Topic Centre on Air and Climate Change (ETC/ACC) a consortium of European institutes under contract of the European Environmental Agency (December 2008) - **Technical Paper - Health Impacts and Air pollution - An exploration of factors influencing estimates of air pollution impact upon the health of European citizens**

http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2008_13_HealthImpact_AirPoll.pdf

Page 35 Table 3.4 Premature deaths attributable to ambient particulate matter. Results are given for total mortality (all causes) based on PM₁₀ exposure (second column) and PM_{2.5} exposure (third column), for cardiopulmonary diseases and lung cancer. 2005

European Environment Agency report (23 March 2009) – How clean is Europe’s air?

<http://www.eea.europa.eu/highlights/how-clean-is-europe2019s-air>

Spatial assessment of PM₁₀ and ozone concentrations in Europe (2005) (5.2MB):

<http://www.eea.europa.eu/publications/spatial-assessment-of-pm10-and-ozone-concentrations-in-europe-2005-1>

Search the report above on ‘premature’ and see particularly pages 5, 20 (Figure 3.4 but note it shows 38 states not 16 or 27) and 21 which show 650 deaths per million on averages from PM₁₀ in the UK in 2005 for people aged 30 and over.

Contacts for European Environment Agency Press Office:

<http://www.eea.europa.eu/pressroom#presscontact>

London Assemble Environmental Committee, Every Breath You Take (May 2009) - An investigation into air quality in London

<http://www.london.gov.uk/assembly/reports/environment/air-quality-report-200904.pdf>

Assessment of Deaths Attributable to Air Pollution: Should We Use Risk Estimates based on Time Series or on Cohort Studies? Kunzli et al 2001

See page ‘1054’ i.e. second last page which refers to ‘the amount of time lost, per statistical victim, turned out to be 9.8 years, which corresponds to a change in life expectancy of approximately 0.6 years in the total population’. Note: 0.6 years is 7.2 months.

<http://aje.oxfordjournals.org/cgi/content/full/153/11/1050>

Preventable environmental impact on mortality and morbidity in countries of the WHO European Region (2007) - The report indicates that well-tested environmental health interventions could reduce total deaths in the countries of the WHO European Region by almost 20%.

http://www.euro.who.int/envhealth/data/20070831_4

Data Management and Analysis Group, GLA Demography update 14-2008 August 2008

<http://www.london.gov.uk/gla/publications/factsandfigures/factsfigures/population.jsp>

ONS Mid-year Population Estimates: 2007. See Table 6 on page 9. 4.469 million people aged 30 or over in Greater London in mid-2007:

<http://www.london.gov.uk/gla/publications/factsandfigures/DMAG-Update-14.pdf>

Ten Great Public Health Achievements – United States, 1900-1999

In last century, the average lifespan of persons in the United States has lengthened by greater than 30 years; 25 years of this gain have been attributed to advances in public health (i.e. 5 due to improvements in medical care)

<http://www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm>

HM Treasury, Pre-Budget Report 2001 Chapter 7: Protecting the Environment

http://www.hm-treasury.gov.uk/prebud_pbr01_repchap07.htm

7.10 Poor air quality poses risks to human health, quality of life and the natural environment. It affects everyone and particularly elderly people and children. Each year in the UK, short-term air pollution episodes are associated with 12,000 to 24,000 premature deaths and 14,000 to 24,000 hospital admissions and re-admissions for respiratory and cardio-vascular problems. Emerging evidence suggests that the health effects of exposure to long-term air pollution are even greater.

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Westminster. It may not apply to policy in Scotland and Wales

Defra: 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

<http://www.defra.gov.uk/environment/airquality/strategy/index.htm>

Note: this does not seem to have a single reference to a number of premature deaths e.g. Volume 1, 'estimated to reduce life expectancy of every person in the UK by an average of 7-8 months with an equivalent health cost of up to £20 billion each year'.

Mayor's Air Quality Strategy, Progress Report to March 2005 (August 2005)

Page 1, 'It is estimated that in 2005, 1031 accelerated deaths and 1088 respiratory hospital admissions will occur in London as a result of PM₁₀ air pollution.' This report seems to be no longer available on the web.

London's poor air quality tackled with launch of Low Emission Zone (4 February 2008) Refers to 1,000 premature deaths per annum http://www.london.gov.uk/view_press_release.jsp?releaseid=15533

Royal Commission on Environmental Pollution, the Urban Environment (6 March 2007) Homepage: <http://www.rcep.org.uk/urbanenvironment.htm>

Summary report (see page 5 for 24,000 premature deaths from Air pollution):

http://www.rcep.org.uk/urban/report/urb_env_summary.pdf

Rogers Review of Local Authority Regulatory Priorities (4 April 2007)

<http://archive.cabinetoffice.gov.uk/rogersreview/>

National enforcement priorities for local authority enforcement services (see page 59, para 5.9 for 'between 12,000 and 24,000 premature deaths each year):

http://archive.cabinetoffice.gov.uk/rogersreview/upload/assets/rogersreview/rogers_review_2007.pdf

617 premature deaths per annum from workplace-related passive smoking before recent legislation came into force

<http://www.bmj.com/cgi/content/full/330/7495/812#TBL1> 2003 BMJ

22,000 premature deaths per year from alcohol consumption

It is estimated that 22,000 premature deaths per year are associated in some way with alcohol misuse. (The Alcohol Harm Reduction Strategy for England, Home Office 2004).

<http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/caboffice%20alcoholhar.pdf>

Appendix One

Table of main urban air pollutants

Pollutant	Main Sources	UK Figures
Nitrogen oxides (NOx) Including Nitrogen Dioxide (NO ₂)	Combustion of motor spirit and other fuel, combustion for domestic heating, power stations, industrial boilers, chemical processes etc.	Road transport 44% Power stations 21% Other industry 9%
Sulphur dioxide	Fuel combustion for power stations, domestic heating, industrial boilers, diesel vehicles, waste incinerators.	Power stations 65% Other industry 10% Refineries 8%
Carbon monoxide	Combustion of motor spirit and other combustion processes.	Road transport 69% Off-road sources 9% Domestic 5%
Ozone	Secondary pollutant resulting from chemical reactions with nitrogen oxides and VOCs.	See NOx & VOCs.
Particulates	Fuel combustion for power stations, transport, heating, other industrial processes.	Construction, mining, quarrying 13% Road transport 20% Power stations 10% Domestic 20%
Volatile Organic Compounds (VOCs)	Transport, oil combustion, chemical processes, solvent use, waste incinerators.	Road transport 27% Solvent use 27% Extraction & distribution of fossil fuels 15% Production processes 12%
Benzene	Combustion of motor spirit, evaporation from petrol pumps and fuel tanks.	Road transport 71%
Lead	Combustion of leaded petrol, coal combustion, metal production.	

Current air pollution bulletin for the UK can be found at:
<http://www.airquality.co.uk/bulletin.php?type=Current>

Appendix Two

Comparison between reports into premature deaths rates in the UK 2005 due to PM₁₀

EEA report: <http://www.eea.europa.eu/publications/spatial-assessment-of-pm10-and-ozone-concentrations-in-europe-2005-1>

ETC/ACC report: [http://air-climate.eionet.europa.eu/docs/ETCACC TP 2008 13 HealthImpact AirPoll.pdf](http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2008_13_HealthImpact_AirPoll.pdf)

Assumption	EEA Report	ETC/ ACC Report
Year of data set	2005	2005
Age group	30+	All ages
Total Mortality per annum PM10 PM2.5	4.3% 6.1% (derived assuming 70%)	4.2% (derived assuming 70%) 6%
Total premature deaths	24,000 (derived)	51,537
Deaths per million of population	650	845 (derived)
Other Key assumptions	<ol style="list-style-type: none"> Health impacts caused by European anthropogenic emissions subtract the contribution from natural and/or non-European sources a uniform reference concentration of 5 ug/m³ has been subtracted. 	<ol style="list-style-type: none"> Health impacts starting with a concentration of zero. Accounting unit for smaller scale grid and movement of city population commuting Case study of central London with average of 11 month life expectancy.

Further confirmation regarding premature deaths and time lost per statistical victim are as relevant for the general public as the average across total population loss of life.

With reference to the research: **Assessment of Deaths Attributable to Air Pollution: Should We Use Risk Estimates based on Time Series or on Cohort Studies.** Kunzli et al 2001
See page '1054' i.e. second last page which refers to 'the amount of time lost, per statistical victim, turned out to be 9.8 years, which corresponds to a change in life expectancy of approximately 0.6 years in the total population'. Note: 0.6 years is 7.2 months.

<http://aje.oxfordjournals.org/cgi/content/full/153/11/1050>

As referenced in the European Environment agency report

<http://www.higher-solutions-for-your-health.com/support-files/studieabgasegesundheit.pdf>