



House of Commons  
Environmental Audit  
Committee

---

**Air quality: A follow up  
report**

---

**Ninth Report of Session 2010–12**

***Volume II***

*Additional written evidence*

*Ordered by the House of Commons  
to be published 26 October 2011*

## Environmental Audit Committee

The Environmental Audit Committee is appointed by the House of Commons to consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development; to audit their performance against such targets as may be set for them by Her Majesty's Ministers; and to report thereon to the House.

### Current membership

Joan Walley MP (*Labour, Stoke-on-Trent North*) (Chair)  
Peter Aldous MP (*Conservative, Waveney*)  
Richard Benyon MP (*Conservative, Newbury*) [*ex-officio*]  
Neil Carmichael MP (*Conservative, Stroud*)  
Martin Caton MP (*Labour, Gower*)  
Katy Clark MP (*Labour, North Ayrshire and Arran*)  
Zac Goldsmith MP (*Conservative, Richmond Park*)  
Simon Kirby MP (*Conservative, Brighton Kemptown*)  
Mark Lazarowicz MP (*Labour/Co-operative, Edinburgh North and Leith*)  
Caroline Lucas MP (*Green, Brighton Pavilion*)  
Ian Murray MP (*Labour, Edinburgh South*)  
Sheryll Murray MP (*Conservative, South East Cornwall*)  
Caroline Nokes MP (*Conservative, Romsey and Southampton North*)  
Mr Mark Spencer MP (*Conservative, Sherwood*)  
Dr Alan Whitehead MP (*Labour, Southampton Test*)  
Simon Wright MP (*Liberal Democrat, Norwich South*)

### Powers

The constitution and powers are set out in House of Commons Standing Orders, principally in SO No 152A. These are available on the internet via [www.parliament.uk](http://www.parliament.uk).

### Publications

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the internet at [www.parliament.uk/eacom](http://www.parliament.uk/eacom). A list of Reports of the Committee in the present Parliament is at the back of this volume.

The Reports of the Committee, the formal minutes relating to that report, oral evidence taken and some or all written evidence are available in a printed volume.

### Committee staff

The current staff of the Committee are Simon Fiander (Clerk), Edward White (Second Clerk), Lee Nicholson (Committee Specialist), Andrew Wallace (Senior Committee Assistant), Jill Herring (Committee Assistant), Edward Bolton (Committee Support Assistant) and Nicholas Davies (Media Officer).

### Contacts

All correspondence should be addressed to the Clerk of the Environmental Audit Committee, House of Commons, 7 Millbank, London SW1P 3JA. The telephone number for general enquiries is 020 7219 6150; the Committee's email address is [eacom@parliament.uk](mailto:eacom@parliament.uk)

# List of additional written evidence

---

(published in Volume II on the Committee's website [www.parliament.uk/eacom](http://www.parliament.uk/eacom))

1	Calor Gas Ltd	Ev w 1
2	Dr Dick van Steenis	Ev w 3
3	East End Quality of Life Initiative	Ev w 4
4	Country Land and Business Association	Ev w 5
5	Joint Nature Conservation Committee, Countryside Council for Wales, Natural England and Scottish Natural Heritage	Ev w 8
6	Dr Michael Bull	Ev w 8
7	Campaign for Clean Air in London	Ev w 10
8	Joule Vert Ltd	Ev w 16
9	Chartered Institution for Water and Environmental Management	Ev w 17
10	CNG Services Ltd	Ev w 21
11	Campaign for Better Transport	Ev w 22
12	Chartered Institute of Environmental Health	Ev w 26
13	British Heart Foundation	Ev w 27
14	Natural Environment Research Council	Ev w 28
15	Councillor Paul Braithwaite, London Borough of Camden	Ev w 30
16	Royal College of Physicians	Ev w 34
17	UKLPG	Ev w 35
18	CountryStyle Recycling Ltd	Ev w 37
19	Air Quality Management Resource Centre, University of the West of England, Bristol	Ev w 37
20	Transport and Environment Committee, London Councils	Ev w 40
21	ClientEarth	Ev w 43
22	Institute for Air Quality Management	Ev w 48
23	Johnson Matthey Plc	Ev w 49
24	Mayor of London	Ev w 50
25	Mayor's Office, Greater London Authority	Ev w 54
26	Chartered Institute of Water and Environmental Management and the Institute of Air Quality Management	Ev w 55

# Written evidence

---

## Written evidence submitted by Calor Gas Limited

### SUMMARY

In our previous submission to the Committee, we drew attention to the alarmingly increased burden of mortality and morbidity on the UK population to result from deliberately worsening air quality by the widespread deployment of biomass. Our fears have since deepened. Existing mortality rates from air pollution are likely to double. The Government is considering relaxing—not tightening—standards on boiler emissions of particulates and NO<sub>x</sub>. To emissions of biomass by combustion need to be added significant emissions from drying the wood. The Government's own assessments identify various other external environmental damages arising from biomass, and it now admits that biomass is considered sustainable even though it might only reduce greenhouse gas emissions by 60%. It has yet to assess the global warming potential of the black carbon emitted from biomass installations. There is no sign yet of the annual MOT of biomass boilers once mooted by HMG to counter expected deterioration in performance over time.

1. Our previous submission to the Committee (attached) still stands. Indeed, the passage of time since the last inquiry has only served to deepen our anxieties.

2. In paragraph 8 of our submission we called attention to the minimum of 340,000 life years to be lost in the single year of 2020 as a result of HMG's biomass targets. Since then a COMEAP report, "The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom" (21 December 2010) has been published. They estimate that the 2008 burden level of particulates cost an "associated loss of total population life of 340,000 life-years...a greater burden than the mortality impacts of environmental tobacco smoke or road traffic accidents". This figure is remarkable. It is exactly the level of extra burden to be inflicted on the UK atmosphere by 2020 under Government policy on biomass, and so, in simple terms, defined public policy can be expected to double existing mortality rates.

3. If anything, the situation on knowingly permitting increased air pollution appears to be worsening. In February 2010, the last Government issued a consultation paper on the Renewable Heat Incentive proposing a significant relaxation in emission standards for smaller biomass boilers under 20MW on the grounds that, "They would rule out most currently produced biomass boilers". If boilers cannot be made compliant with the emission limits to enable safe operation which presumably underlie the calculations of mortality given in the written answers referred to in our original submission the damage to human life and health should be revised upwards. It is, in fact, an indictment of the policy if biomass technology based on maximum emissions levels of 20g/GJ for particulate matter (PM), and 50g/GJ for nitrogen oxides contributes to costing the UK up to 1,750,000 life years in one year alone, and the Government is now determined to relax those limits to 30g/GJ for PM and 150g/GJ for NO<sub>x</sub>—increases of 50% and 200% respectively. The latest RHI policy document pays lip service to "mitigating against its (biomass') harmful impacts" (p.49) but the truth is that it is allowing them to pollute more than originally intended and DECC is yet to establish a way of enforcing and administering these relaxed limits. The inconvenience of biomass boilers not being able to comply with originally aspired levels of emission is overcome by relaxing the rules, increasing emissions, and causing extra loss of life. Health policy and air quality policy are being steamrollered by energy policy. There is no better example of this than the permission given to build a biomass plant in Port Talbot of all places—Port Talbot already suffers the worst air quality environment in Wales.

4. It has also become clear since our original submission that there are other noxious emissions from biomass that are routinely ignored. Biomass has to be dried before combustion can take place. Passive drying can take place but it takes much longer and still leaves 25–30% water content. Pellet mills generally require moisture contents of less than 15% to produce stable and durable pellets. Therefore, different types of thermal treatment are applied to biomass to dry it. Environmental emissions result from both the drying process and combustion in the boiler. These emissions typically include particulates, VOCs, and NO<sub>x</sub> to the extent that a common problem around biomass drying plant is so called noxious "blue haze". "" Volume 34, Issue 10, October 2010, pp. 1457–1465 confirms that, "Forest residues require a drying stage, which involves high energy consumption and high environmental impact."

5. The UK Revised National Policy Statements on Energy (DECC, 2011) reveal the damage to the environment likely from "considerable" transport movements connected with biomass plant: "Depending on the location of the facilities, air emissions and dust, which could impact sensitive flora, may also be increased through the high number of heavy goods vehicles transporting fuel and combustion residues" (p25). "There are potential negative environmental effects, including on climate change and air quality, of increased transportation throughout the lifetime of the facility...The overall effect of implementation on traffic and transport of biomass/waste combustion through the implementation of EN-3 is considered to be negative in the short, medium and long term. These effects are primarily from the movement of fuel and residue during the operational phase of the facility, although some significant, short term, local negative effects may result from the movement of component parts to the facility during construction" (p.39/40). The Revised Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) also admits environmental damage from biomass plants: "Biomass or EfW plants are likely to generate considerable transport movements. For example, a biomass or EfW plant that uses 500,000 tonnes of fuel per annum might require a minimum of 200 heavy goods vehicles (HGVs)

**Ev w2 Environmental Audit Committee: Evidence**

---

movements per day to import the fuel. There will also be residues which will need to be regularly transported off site” (para.2.5.22).

6. The pollution caused by biomass does not end there: “Biomass combustion plant will also produce both combustion and flue gas treatment residues...Waste combustion fly ash is classified as a hazardous waste material and needs to be managed as such (EN-3, paras. 2.5.67 and 2.5.68). The Appraisal also identifies significant negatives arising from biomass in terms of water quality, noise, visual intrusion, soil contamination and flood risk.

7. In June 2010, the Manomet Centre for Conservation Sciences issued a report commissioned by the Commonwealth of Massachusetts entitled, “Biomass Sustainability and Carbon Policy”. We know from this that biomass emits more greenhouse gases than fossil fuels. In relation to electricity generation the ratios of the emission of carbon dioxide per BTU of heat generated are 863 for biomass: 642 for coal: 355 for natural gas. In relation to thermal heat generation, the ratios are 360 for biomass: 217 for heating oil: 138 for natural gas. Depending on what form of electricity generation it displaces biomass repays its carbon debt over a number of years: if it is displacing electricity generated by natural gas this repayment period may be up to 90 years; if it is displacing electricity generated by coal the repayment period is 21 years. The report concludes: “So, over a long period of time, biomass harvests have an opportunity to recover a large portion of the carbon volume removed during the harvest. However, this assumes no future harvests in the stand as well as an absence of any significant disturbance event. Both are unlikely.” Recovering the carbon debt is at best a gamble.

8. Why are these emissions ignored? Is it all for the greater good in the light of biomass being “zero carbon” and, therefore, “sustainable”? DECC does not even sport this figleaf—DECC has had to recognise that biomass has a carbon footprint, but has now got itself into the logically absurd position of defining the technology as zero carbon (and therefore worthy of subsidy) even though it might deliver only a 60% reduction in greenhouse gas emissions (“These sustainability criteria include a minimum greenhouse gas emissions saving of 60% compared to fossil fuel”—Written Answer, 20 January 2011). It has come to a sorry pass when a Government defines a quantum of 40 (100–60) as equivalent to zero.

9. We need to adopt a precautionary principle in relation to the emissions of black carbon (BC) from biomass. BC is part of the particulate emissions caused by combustion. When asked about the BC emissions from biomass the former Minister, Joan Ruddock MP admitted: “Specific estimates of black carbon emission have not been made in support of the development of the Renewable Energy Strategy” (Written Answer, 24.11.09, col. 81W). BC is the second largest contributor to global warming after CO<sub>2</sub>.

10. The UN’s Economic Commission for Europe found that, “Urgent action to decrease (black carbon) concentrations in the atmosphere would provide opportunities, not only for significant air pollution benefits (e.g. health and crop-yield benefits), but also for rapid climate benefits, by helping to slow global warming and avoid crossing critical temperature and environmental thresholds,” (UNECE’s Executive Body for the Convention on long-range transboundary air pollution, meeting in Geneva, 15–18 December 2008: Item 13 of provisional agenda. Air pollution and climate change: developing a framework for integrated co-benefits strategies). “Available research suggests that adapting future regulation and policy with a view to limiting BC emissions could significantly slow global warming. It would also yield benefits in terms of human health, reducing the social and economic burden associated with illness and reduced life expectancy as well as the associated costs” (“Black Carbon and Global Warming: Impacts of Common Fuels, Atlantic Consulting, 2009). The reduction of black carbon is being targeted through a revision of the Convention’s Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol), which will now include black carbon as a component of fine particulate matter. The detailed dispositions of the Protocol to include black carbon and determine black carbon emission reduction measures are the subject of negotiations by representatives of Parties to the Protocol this week. In a press release dated 15 April 2011, UNECE confirmed that, “Nearly 50% of the remaining mitigation potential for black carbon emissions in the UNECE region is to be found in the residential heating sector. This will become the dominating source of black carbon emissions in most countries in the region by 2020, and cause about half of total emissions”. The possibility that biomass could potentially contribute to global warming by emissions of BC would be perverse indeed.

11. It is vital to ensure that the design, construction and installation of biomass boilers is absolutely correct so that the equipment functions optimally and “does what it says on the tin”. A lot is at stake here in terms of air quality, human health and the use of taxpayers’ money. Just as important, the original Renewables Strategy in 2008 was fully cognisant that biomass equipment needed monitoring after installation. Para 4.6.25 read: “Given that equipment deteriorates over time and needs to be operated properly, we may need to update regulations to ensure that installed equipment continues to be run in a way that meets emissions standards. Any type of approval scheme may therefore need to be complemented by arrangements to ensure that emission standards are maintained. In other countries, including Austria, Germany, Denmark and the United States, concerns over air quality deterioration caused by older style biomass boilers has led to the introduction of an MOT-type scheme, whereby the owners are required to have their boilers serviced on a regular (for example, annual) basis. If arrangements to maintain emission standards are considered necessary for the UK, proposals as to the mechanism for doing so will be the subject of a later consultation.” So, it is vital for the sake of protection of human health that biomass boilers are regularly inspected and we would thoroughly endorse the concept of an annual MOT type scheme (of which there is as yet, no sign). Without such an annual MOT there

is grave danger that the taxpayer subsidy given to biomass will prove bad value for money when domestic RHI for biomass begins in 2012.

16 May 2011

### Written evidence submitted by Dr Dick van Steenis

Any improvement in local or national air quality cannot be formulated or implemented until the following facts are dealt with ruthlessly.

1. The Health Protection Agency, PCTs/Health Boards & the Environment Agency have refused to examine NHS/ONS data at ward level upwind versus downwind to determine the current position despite practice deemed essential by WHO & USEPA since 1997. Instead they falsely allege “no problem” Nor have these bodies done any PM2.5 air monitoring including analysis of content as done in Sweden, Finland, USA & Mexico City.

2. Despite the EC PM2.5 Urban Air Quality directive put into UK law in mid 2010 DEFRA has just installed some 30 TEOM machines mostly in London clear of the 9 incinerators and fiddled them down to falsely and fraudulently read a constant reading of 15ug/m<sup>3</sup> when readings after installation before fiddling averaged about 50ug/m<sup>3</sup> in Hillingdon etc. This follows DEFRA’s fiddling of the nationwide PM10 TEOM machines to read a constant 26ug/m<sup>3</sup> since around the time John Prescott downgraded the Environment Protection Act in 2000 to “anything will do”. The Environment Agency graphs in 2010 confirmed this fact. It is impossible to sort anything without looking at health data and getting honest readings of PM2.5s.

3. The committee must understand that PM10s as monitored do NOT get into the lungs proper so do not affect health. Only PM2.5s & smaller affect health. The burning of waste in incinerators & cement works and in power stations and use of waste fuels in bulldozers & incinerators all produce PM1 to PM2.5 particles. These cause illnesses and premature deaths. The same laws to regulate PM2.5s apply in USA, Canada & Japan. The proper regulation including court cases by the USEPA has since the 1997 laws saved the US taxpayer £855 BILLION until this year. The recent USEPA report has been suppressed from the UK media. Furthermore in 2005–06 alone, USA deaths dropped by 6% and illness rates have evened out largely between poor black and rich white areas. In contrast UK NHS spending has soared and the UK is around the worst in the industrialised world with health, education etc. Your committee now has an opportunity to sort this problem.

4. In Sweden in one town 2007 PM2.5 emissions were caused by—33% the new incinerator (better quality than UK ones no doubt) 33% the oil refinery, c14% traffic 15% domestic heating 5% agricultural dust etc. In Mexico city the municipal incinerator was proved to be causing the smog and high death rates. That incinerator like UK ones was emitting PM2.5s & PM1s. Autopsies in Mexico City revealed PM1 particles (from the incinerator) in brain & red cells which were not found in autopsies clear of the incinerator. The UK Environment Agency has written that 90% of PM1s escape through UK bag filters and 35% of PM2.5s also escape through UK incinerator bag filters. The UK incinerators are authorised to emit 40 to 120 times the particulates than those in Finland or Sweden. This reveals the state of corruption in the UK where the lobbyists like Enviro and Friends of the Earth are misleading DEFRA and government quangos. The regulators are refusing to check anything out. We have new incinerators virtually banned in USA, France, Belgium etc with the only safe system of plasma gasification being built instead. We have Veolia building plasma gasification in USA 2010 while building junk-quality-specified incinerators in the UK.

5. If costs of health are taken into account, it has been proved at Kings Lynn with comparable quotes that the proposed incinerator will cost 6 TIMES the costs of plasma gasification over the 25 years contract wasting £650 million of tax payers cash. Your committee must check this out.

6. UK incinerators are increasing infant mortality by 8 per 1,000 births for 15 miles downwind, doubling the heart attack deaths etc. The solution is for a health tax of £60 per ton incinerated including any waste fuel used. This will force a change to plasma gasification with subsequent cutting of landfill and increasing electricity supply to almost treble that of EfW plants.

7. It has been proved that PAH emissions produce low birth weight babies, drop IQ in direct proportion, cause asthma, heart attacks and cancers and affect child behaviour adversely. Studies in Michigan, New York, North Carolina and Chicago in published journals provide details. Primary school results in NSW Australia and GCSE results in Wales exemplify this also.

**Annex**

#### LAWS RE INCINERATORS BROKEN BY WELSH ASSEMBLY GOVERNMENT

1. 19 November 2008/98/EC on WASTE put into UK law Dec. 2010.—MUST USE LATEST SAFEST TECHNOLOGY TO PROTECT PUBLIC HEALTH ie plasma gasification as used in USA, France, Japan etc & two passed in England 2011.

**Ev w4 Environmental Audit Committee: Evidence**

2. Same 2008/98/EC law states public must be involved in discussion/planning FROM OUTSET. This is not happening. Lobbyists & politicians determine junk quality incinerators not remotely like plasma gasification or incinerators in Finland.

3. Environment Protection Act 1990 & IPPC. Environment Agency must prevent emissions from harming health. Not done. Only PM10 monitored which do not enter the lungs or affect health. Must monitor PM2.5s (35% escape through filters says EA 2010 & 2011) & PM1s (90% escape through filters agrees EA 2010 & 2011). These are the ones that damage health.

4. Human Rights Act. Regulators must not kill. Councils have duty of care.

5. Human Rights Act. Regulators must not make ill (torture) Councils have duty of care.

6. Human Rights Act article 8. Regulators & councils must not affect family life.

7. PM2.5 Air quality industrial emissions directive EC 2008 put into UK law 7 July 2010. Orders urban areas eg Cardiff to be below 25ug/m<sup>3</sup> by 2010 & 20ug/m<sup>3</sup> by 2015. Balance of UK to be below 25ug/m<sup>3</sup> by 2015. Why has there not been PM2.5 beta monitors (BAM) been installed in Cardiff, Merthyr & Newport yet? Newport & Merthyr refuse as they know the readings will exceed the legal limit now. Merthyr will be very high now with Ffos-y-Fran.

19 May 2011

---

**Written evidence submitted by East End Quality of Life Initiative**

1.1 East End Quality of Life Initiative have been working with local community groups in Sheffield on the issue of Air quality for 11years . We have campaigned with local community organisations to try and influence the City Council and Highways Agency. We co-ordinate a Community Air Quality Monitoring Project Working with the City Council. We worked with Sheffield City Council to develop a Air quality Action Plan in 2003 this in retrospect was a wish list of actions that had little weight within the local authority beyond the Environment Protection Service who promoted the action plan. The City Council have recently consulted on a new Draft Air Quality Action Plan that aims to bring Nitrogen Dioxide within EU limit values by 2015.

1.2 We need to win decision makers and the citizens of Sheffield to championing an effective implementation of this action plan. We have to meet European limit values by 2015 yes, but the better health, quality of life, improved economy and image of city that implementing the proposed measures at the necessary scale would be a defining moment for the ambition of the city. Some recent planning application have highlighted to us the lack of weight air pollution and health have within influential departments of the local authority and beyond.

1.3 The Government are not showing any leadership , they can't just leave it to local authorities to meet EU Limit value laws. There is an economic case and it is cost effective don't be intimidated by the economic heavyweights

We think it is important to make the following linkages. The economy is not separate from health and environment. A healthier population is vital to improving the economy of our city.. Your report last years stated:

“The cost benefit is clear; what we need now is the political will to make this a priority and to commit the resources to address it now so that we can reap the benefits of improved health”.

An example of how health is an economic issue would be the raising of retirement age to 68, three quarters of the population do not have a disability free life expectancy as far as 68. (Fair Society Healthy Lives The Marmot Review 2010)Many chronic respiratory and cardio- vascular conditions are exacerbated by poor air quality.

The health costs in 2007 of poor air quality in Sheffield was £95 million. Up to 500 people die early in Sheffield because of poor air quality . A report in the Lancet recently suggested that 5% to 7% of all heart attacks are triggered by poor air quality. (Nawrot. T S et al. *Public health importance of triggers of myocardial infarction: a comparative risk assessment*. The Lancet, Volume 377, Issue 9767, Pages 732—740, 26 February 2011).

1.4 A communications strategy is needed that stresses the seriousness of the health implications for the people of England, the cost to the health service and the economy of not tackling this issue and the positives of a much improved image for urban areas a more active and healthier population enjoying life in a twenty first century city. There is a feeling in the city that we have to tackle this issue. Even The Star ( local evening newspaper) opinion column on 28<sup>th</sup> February agrees that this issue should be tackled. See [www.sheffledeastend.org](http://www.sheffledeastend.org) for a flavour of local communities in Sheffield working together on air quality issues.

24 May 2011

---

---

## Written evidence submitted by Country Land and Business Association (CLA)

### INTRODUCTION

The Country Land and Business Association (CLA) represents some 35,000 members who between them own and manage half the rural land in England and Wales. We have long taken a deep interest in energy policy, as our members manage a large proportion of the resources that may be brought to address climate change.

In the course of this work we have investigated the development and use of biogas from Anaerobic Digestion, have undertaken international study trips and supported the work of Task 37 (energy from biogas and landfill gas) of the International Energy Agency.

Biogas when upgraded to bio-methane is an almost perfect renewable transport fuel.

We are disappointed and confused that UK policy has so far missed the huge potential for biogas to address both arms of air quality: reducing the emissions of GHG in transport, while at the same time delivering improved air quality through significant reductions in particulates and noxious tailpipe emissions.

### KEY ISSUES

- The role of “dirty” diesel transport in poor air quality (particularly in urban areas).
- The poor performance of electrification in road transport, particularly for buses and HGVs, especially taking into account current grid average GHG and emissions from conventional electricity generation.
- The EU comparisons between hybrid and CNG.
- The “stepping stone” and security of supply back up provided by full switchability between natural gas and bio-methane.
- The flexibility of dual fuel vehicles and the low costs of switching.
- The clear and obvious example of significant benefits shown in Sweden.
- The failure of UK policy to address the role of biomethane in transport.

#### *The role of “dirty” diesel transport in poor air quality (particularly in urban areas)*

1. The CLA does not claim expert knowledge of the relative air quality impacts of different transport fuels, but notes that where air quality has been found a problem elsewhere in the world, changes to transport policy has delivered benefits. For example many cities across the world have limited entry by vehicles to reduce pollution. In India, some authorities have required “tuk tuk” taxis to switch to running on gas to reduce emissions.

2. It is clear that even modern “cleaner” diesels produce significant disbenefits to air quality, and rather than restrict the use of such vehicles, with significant effects on the economy and society, alternative fuels may offer a better solution.

#### *The poor performance of electrification in road transport, particularly for buses and HGVs, especially taking into account current grid average GHG and emissions from conventional electricity generation*

3. We have noted that Transport for London has invested significant sums in new hybrid electric buses. These are recharged with grid average electricity, at 0.57098kg/kW (taken from 2010 Guidelines to Defra / DECC’s GHG Conversion Factors for Company Reporting.<sup>1</sup>

4. However, these buses are extremely expensive: Transport for London states “Hybrid buses currently cost approximately £110,000 more than a conventional diesel bus. For example, a hybrid double deck bus for London would cost £300,000 compared with £190,000 for the diesel equivalent. Initial indications are that maintenance costs are about the same as a conventional diesel bus, although replacement of batteries after about five years will require further capital investment”.

5. Transport for London claims “Compared with diesel buses, hybrid buses deliver environmental benefits, including:

- Minimum 30% reduction in fuel use.
- Minimum 30% reduction in carbon dioxide.
- 3 decibel [dB(A)] reduction in perceived sound levels.
- Reduced oxides of nitrogen and carbon monoxide”.

6. In contrast, recent research<sup>2</sup> for the Baltic Biogas Bus partnership undertaken by the VTT technical research centre of Finland states that:

- Currently new (EEV certified) methane buses clearly outperform new (EEV certified) diesel vehicles for NOx as well as PM.
- methane vehicles provide true EEV performance over time.

---

<sup>1</sup> Annex 3 at <http://archive.defra.gov.uk/environment/business/reporting/pdf/100805-guidelines-ghg-conversion-factors.pdf>

<sup>2</sup> [www.balticbiogasbus.eu/web/Upload/doc/St\\_Petersburg\\_201011/VTT\\_gas%20bus%20benefits\\_2511\\_Arnold.pdf](http://www.balticbiogasbus.eu/web/Upload/doc/St_Petersburg_201011/VTT_gas%20bus%20benefits_2511_Arnold.pdf)

**Ev w6 Environmental Audit Committee: Evidence**

- 
- All methane fuelled vehicles deliver very low PM emissions.
  - stoichiometric vehicles deliver lower NOx and lower fuel consumption.
  - Clear benefit for methane also for unregulated emissions (PM numbers, aldehydes, PAH, direct NO2 emission etc).
  - Main drawback of spark-ignited methane compared to diesel is higher energy consumption.

The lower energy yield of methane in engines means that CO<sub>2</sub> emissions are roughly equivalent between diesel and methane power, but this has been fixed in Sweden by switching from natural gas to bio-methane.

**THE EU COMPARISONS BETWEEN HYBRID AND COMPRESSED NATURAL GAS (CNG)**

7. ComPro, the EU common procurement office undertook a comparative study of bus technologies, with a side by side comparison of the costs and benefits of the alternatives, based on CNG buses<sup>3</sup>. This is précised below:

**Comparative cost/effectiveness analysis between CNG bus and DEhybrid technology**

- *Experience* in Europe CNG technology is much more experienced, while DE-hybrid is only partially experienced.
- *Extra infrastructure* CNG needs an extra natural gas filling station to be built; for already existing filling station, the possibility of saturating its capacity represents an advantage.
- *Range* DE-hybrid can assure an higher range, while CNG provides a reduced range depending on the availability of a natural gas filling station.
- *Pollution* DE-hybrid technology strongly reduces Pm, NOx and CO<sub>2</sub> emissions, while CNG technology is responsible for higher CO<sub>2</sub> and no PM emissions.
- *Fuel consumption* is concerned: DE-hybrid strongly reduces fuel consumption.
- *Fuel cost* diesel cost is rapidly increasing (in Italy one litre diesel costs so much as one litre gasoline, that is 1,5 euro), while natural gas costs almost half so much as diesel.
- *Vehicle cost* is concerned: DE-hybrid buses cost about 120.000 euros each more than CNG ones.
- *Noise* is concerned: DE-hybrid buses are less noisy than CNG ones.
- *Energy source dependence* is concerned: there is a reduced dependence on energy import by DE-hybrid technology, while CNG technology depends on natural gas import.

8. The key issue for urban transport is whether hybrid is the way forward, or to adopt CNG as a stepping stone to a renewable future based on bio-methane.

9. The capital costs of replacing bus fleets with hybrids (at least an additional £100,000 per vehicle) together with the slow progress (waiting for existing buses to be retired) may be considered to be less advantageous than an early conversion of existing buses to dual fuel.

*The “stepping stone” and security of supply back up provided by full switchability between natural gas and bio-methane*

10. Bio-methane (produced from Anaerobic Digestion) is identical to natural gas, being almost completely methane. Current supplies of natural gas are available wherever fuel supply is required through the national gas grid (save in the rural areas).

11. Vehicles converted to run on natural gas require no further work to switch to use of bio-methane, and should renewable supplies run short natural gas is available.

12. Pending decisions on the environmental performance and regulatory framework, supplies of shale gas may well contribute to security of supply.

13. The development of gas filling stations and the conversion of vehicles is relatively cost effective.

*The flexibility of dual fuel vehicles and the low costs of switching*

14. Hardstaff is the leading supplier of “dual fuel” vehicles<sup>4</sup> and can readily supply conversion for buses fitted with electronic fuel injection systems, at cost effective prices. They currently supply a range of heavy good vehicles (Mercedes Benz and Volvo) and have over 80 million kilometres of dual fuel operation.

15. Many cities around the world have switched to gas for bus transport—the UK is almost unique in seeking more expensive hybrid technology.

16. The ComPro report suggests that the additional costs of GNG buses is only 30,000 Euro per vehicle.

---

<sup>3</sup> [www.compro-eu.org/doc/D2.3\\_Cost%20effectivness%20analysis%20of%20the%20selected%20technologies.pdf](http://www.compro-eu.org/doc/D2.3_Cost%20effectivness%20analysis%20of%20the%20selected%20technologies.pdf)

<sup>4</sup> [www.hardstaffgroup.co.uk/site/hardstaff-dual-fuel-technologies](http://www.hardstaffgroup.co.uk/site/hardstaff-dual-fuel-technologies)

17. Dual fuel offers opportunities for more extensive air quality benefits as it is also suitable for long distance transport fleets of HGV and smaller lorries.

*The clear and obvious example of significant benefits shown in Sweden*

18. In 2010, with sponsorship from the FCO, CLA joined with Task 37 to take two DfT officials on a fact finding visit to Sweden to explore the use of gas as a vehicle fuel.

19. It was clear to all that in Malmo the use of biogas to fuel buses has led not only to significant air quality benefits but also to meeting renewable energy targets and reducing noise pollution.

20. Sweden has a well regulated and highly developed bio-methane transport policy, which currently delivers significant quantities of sustainable clean fuel.

21. During 2006, almost 24 million normal cubic metres of biogas were used as vehicle fuel in Sweden, which is equivalent to 26 million litres of petrol. 2006 was the first year in Sweden when more biogas was sold as vehicle fuel than natural gas (biogas comprised 54% of the total volume).

22. Swedish regulations require low sulphur and particulate content in the fuel, leading to very low tailpipe emissions.

*The failure of UK policy to address the role of biomethane in transport*

23. Hybrid technologies cannot themselves deal with the air quality agenda.

24. However, concentration on hybrids and liquid biofuels has led to the under-development of biomethane as transport fuel.

25. The use of biomethane is not adequately supported in the UK, compared to other countries like Sweden.

**RECOMMENDATIONS**

26. DfT should consider the necessary policy actions required to ensure a large scale switch of the UK bus fleet to:

- Dual fuel (gas and diesel).
- CNG and LNG.
- Bio-methane.

27. Once buses and HGV are capable of running on gas, it is a short step to switch over to bio-methane as soon as supplies are available.

28. Operators of dual fuel vehicles have evidence to show cost savings may be achieved as well as improved air quality. DfT should take time to talk to Hardstaff (a leading British Company) to learn what is needed to widen the use of dual fuel buses.

29. CNG and LNG buses are widely available across the world. UK lags behind the adoption of this beneficial fuel use which is rapidly growing in other countries.

30. Bio-methane is a direct replacement for natural gas, and enables climate change benefits to be added to the air quality benefits of running buses on gas.

31. The supply of bio-methane is limited at present, but should grow as more AD plants install upgrading and connect to the gas grid with support from the recently announced Renewable Heat Incentive. In order to drive the uptake of bio-methane in the transport sector, the Renewable Transport Fuel obligation should be amended so that the number of certificates awarded per litre reflect the GHG savings achieved (on a whole life cycle basis) of the fuel

**CONCLUSIONS**

32. There is an obvious and relatively inexpensive route to better air quality, which does not depend on re-equipping bus fleets with expensive and short life battery powered hybrid vehicles (batteries have a relatively short life compared to internal combustion engines).

33. Equally, wider air quality benefits would be delivered by better incentives to take up CNG and bio-methane in transport fleets.

34. DfT should require and work with bus operators to ensure they adopt gas, and rapidly move them up the scale towards a bio-methane powered sustainable bus transport system for urban areas—as is demonstrated in Malmo, Sweden.

**Ev w8 Environmental Audit Committee: Evidence**

---

**Written evidence submitted by Joint Nature Conservation Committee, Countryside Council for Wales, Natural England and Scottish Natural Heritage**

JNCC is the statutory adviser to Government on UK and international nature conservation. Its work contributes to maintaining and enriching biological diversity, conserving geological features and sustaining natural systems. JNCC delivers the UK and international responsibilities of the four country nature conservation agencies - Council for Nature Conservation and the Countryside, the Countryside Council for Wales (CCW), Natural England and Scottish Natural Heritage (SNH). This response is made on behalf of JNCC, CCW, Natural England and SNH.

1. JNCC submitted written evidence to the Environmental Audit Committee's air quality inquiry in 2009/10. Our evidence focussed on air pollution threats to the natural environment. It covered air quality effects on ecosystems, in particular in relation to UK nature conservation policy commitments, taking into account atmospheric deposition of pollutants in addition to concentrations, as these are both important pathways for exposure of ecosystems.

2. Our response to this succeeding inquiry focuses on the second question put to consultees "the impacts on health and the environment from particulate and NO<sub>2</sub> pollution, and how these should be measured", focussing on the natural environment and only covers new evidence since our response in December 2009.

3. In relation to this, in our previous written evidence we summarised:

3.1 "There is strong evidence of the effects of air pollution on semi-natural ecosystems in the UK. Large areas of sensitive ecosystems remain at risk from atmospheric deposition in 2020. This includes nature conservation sites protected under national and European legislation.

3.2 The Government's understanding of, and commitment to, investigating the environmental risks of air quality at a broad level is good. However, there is a need for more work to interpret effects in relation to policies for biodiversity and ecosystem services."

4. Addressing these points, during 2009 and 2010, JNCC together with Defra, and the country conservation agencies funded a major collation of evidence of nitrogen deposition impacts on biodiversity and an interpretation of this evidence in relation to biodiversity policy commitments (Stevens et al., in press; Emmett et al., in press). This has provided convincing evidence of nitrogen deposition impacts on biodiversity:

4.1 Nitrogen deposition has resulted in changes in both plant species occurrence and ecosystem function across Great Britain.

4.2 This is compromising our ability to deliver current conservation commitments such as the objective to achieve favourable conservation status under the Habitats Directive and the country biodiversity strategies and frameworks.

4.3 Looking to the future, predictions of deposition in 2020 indicate risk levels will remain high and impacts observed on the ground may well increase in frequency and at lower deposition levels due to the cumulative effects of nitrogen deposition over time.

4.4 Recovery is only likely in local areas where emission control measures have been put in place as options for mitigation through management are limited.

5. We note that the primary focus of your report is the Government strategy for meeting obligations under EU Air Quality Directives for NO<sub>2</sub> and PM<sub>10</sub>. However, this study provides convincing new evidence of nitrogen deposition impacts on UK biodiversity. Nitrogen deposition in the UK occurs as a result of transport and transformation of emissions of both ammonia and oxides of nitrogen. Reduced and oxidised forms of nitrogen contribute equally to the nitrogen deposition on average across the UK (RoTAP, in press). Therefore, emissions of NO<sub>x</sub> make a significant contribution to the impacts on biodiversity. The reduction in emissions of NO<sub>x</sub> seen over the last two decades (approximately 50%) has not been translated into an equal reduction in deposition in the UK (which has declined by approximately 24% over the same time). This non-linearity is thought to be due to changes in chemical processing of NO<sub>x</sub> emissions in the atmosphere (ROTAP, in press).

6. JNCC can provide a more comprehensive briefing and/or the full report covering this new evidence if requested by the Committee.

26 May 2011

---

**Written evidence submitted by Dr. Michael Bull****SUMMARY**

- The current practice of Air Quality Action Planning undertaken by local authorities has not produced any tangible improvement in air quality and is unlikely to do so in the future—a change in the process is required.
- There are still serious data gaps that restrict how the UK can plan to meet air quality limit values set to protect human health.

---

## INTRODUCTION

1. I am a professional air quality consultant and have worked in this field for over 20 years. I was a founder member of the Institute of Air Quality Management and am currently its Membership Secretary. I am a director of Ove Arup and Partners responsible for its Environmental Consulting business. I am writing this submission in my private capacity.

## SUBMISSION

2. The main air pollutants of concern in the UK are nitrogen dioxide (NO<sub>2</sub>) and fine particulate matter (PM<sub>10</sub>). Both are emitted in vehicle exhausts and road transport is usually the main source of these pollutants in UK urban areas. The UK has introduced “Air Quality Objectives” for both these pollutants, these are objectives that we should “work towards” achieving. However, as a result of European legislation, we also have air quality limit values that are statutory standard that the UK must achieve by particular target dates. The UK is currently considering applying for an extension to the time period for achieving the limit value for NO<sub>2</sub> and already has made an application to extend the time limit for PM<sub>10</sub>. At present, however, the relevant limits values should have been achieved in the UK.

3. In the current system of air quality management local authorities have the responsibility of reviewing and assessing air quality. In areas where the air quality objectives are not predicted to be met, local authorities must declare Air Quality Management Areas (AQMAs) and then prepare and implement Air Quality Action Plans that detail the measures that will be taken to improve air quality.

4. The process is well established having operated for over 10 years, the assessments of air quality have been made and many AQMAs have been identified in the UK. The Review and Assessment part of the Air Quality Management system appears to have worked well, however, I would challenge the Commission to find any evidence that the process of Air Quality Action Planning has produced any tangible improvement in air quality nor will be likely to do so in the future. Whilst it initially appears a sensible and appropriate mechanism to improve air quality at a local level, the nature of the air quality problems in the UK and the mechanisms available to local authorities to facilitate improvements mean that Action Planning cannot deliver air significant air quality improvements. There is an urgent need to change this process so that tangible air quality improvements can be delivered in the UK.

5. In almost every case, AQMAs have been declared as a result of emissions from road traffic although in large cities the problems are exacerbated by other emissions across a wide area which leads to higher concentrations of pollutants in the central areas of cities. However, even in smaller towns, air quality objectives are exceeded and this appears to be as a result of traffic emissions, particularly in towns where there is slow moving traffic in streets surrounded by buildings. These conditions lead to the situation where pollutants are unable to disperse well and hence accumulate giving high pollutant concentrations. Slow moving traffic appears to be a particular problem leading to higher emissions of pollutants particularly nitrogen dioxide. To improve air quality in such situations, local authorities either need to reduce the traffic flows through affected roads or reduce the emissions of the vehicles using the roads. However, local authorities are normally not responsible for the major roads in their areas, these usually being controlled by the County Council, the Highways Agency or (in London) TfL. Whilst they can make minor changes to roads including the addition of some traffic management measures, these are simply insufficient to bring about any significant improvement in air quality. To achieve an improvement in air quality requires substantial reductions in traffic flows which can only be achieved by construction of new roads.

6. This situation is best illustrated by some examples, the town of Cullompton in Devon is a small market town but nitrogen dioxide concentrations in parts of the town are well above the air quality objective of 40µg/m<sup>3</sup>. Monitoring results show that concentrations have remained above 50 µg/m<sup>3</sup> since at least 2004 with no tangible improvement. It is estimated that 86% of the nitrogen oxides emissions in parts of the town derive from local traffic. The town has no bypass and consequently traffic has to pass through the town centre. The town has a comprehensive Air Quality Action Plan, which has identified a range of measures to improve air quality, however, only one is expected to deliver air quality improvements that would reduce pollutant concentrations by more than 2µg/m<sup>3</sup>—in effect, a new bypass costing more than £12 million. The council hopes to raise money through Section 106 contributions or funding mechanisms but cannot guarantee it can raise these, nor is it the responsible highways authority and hence cannot directly plan construction of a new road. It is able to plan some traffic management and parking measures in the town but the council do not consider these are likely to give significant improvements in air quality and certainly not enough to meet the air quality objectives. The town experiences pollutant concentrations well in excess of the air quality objectives but is essentially powerless to take action.

7. In my home town of Tunbridge Wells, an AQMA has been declared on the A26 which is the main route through Tunbridge Wells—there is no alternative direct route around the town and consequently little prospect of reducing traffic flows along this route. Monitoring along the route shows that concentrations have remained static or even increased for the past 5 years. On parts of the road it is estimated that traffic related emissions need to reduce by nearly 40% to achieve the limit value. Frankly such reductions are unachievable using the powers available to local authorities and Action Planning at local authority level is consequently only likely to have a minimal impact.

**Ev w10 Environmental Audit Committee: Evidence**

8. The situation has been exacerbated by recent research undertaken on behalf of Defra demonstrating that vehicle emission controls have failed to produce the reduction in pollutant emissions expected<sup>5</sup>. When the process of air quality assessment began some 10 years ago, it was expected that national initiatives to reduce pollutant concentrations, particularly emission controls from vehicles, would bring about substantial reductions in pollutants concentrations. As a result, most early assessments of air quality undertaken by local authorities were able to demonstrate that air quality objectives would be met by their relevant target years. However, these improvements have not materialised in practise and pollutant concentrations have not declined as expected. Recent research has shown that the national measures to control vehicle emissions have not been effective and consequently pollutant concentrations have remained stubbornly above the air quality objectives.

9. This research has identified some of the reasons that emissions did not fall but further research is still required to fully understand this issue. Without this information it is not possible to design measures that would reduce pollutant concentrations with any confidence.

10. The current approach of placing all the responsibilities for air quality improvements with local authorities will inevitably fail as they do not have the necessary powers to take effective action. Action Planning will have to include DEFRA, the relevant Highways Authority and (in some cases) the Environment Agency with all of these bodies taking responsibility collectively to deliver the air quality improvements required to meet air quality standards. In addition, current Action Plans only quantify in very general terms the likely air quality improvements that will be achieved by the proposed measures. There is consequently no information available that details when air quality objectives and limit values will be met. If the Government seriously wishes to address the current air quality problems in the UK it needs to take Action Planning seriously, ensure that all responsible bodies are required to input into the plan and be responsible for the agreed actions and that Action Plans include a detailed assessment of the expected improvements in air quality and the likely timescales for achieving the relevant objectives and limit values.

25 May 2011

---

**Written evidence submitted by Campaign for Clean Air in London****INTRODUCTION**

1. Clean Air in London (CAL) submits this memorandum to the Environment Audit Committee's (EAC's) inquiry "Air Quality: a follow up report" which opened on 11 May and closes on 3 June 2011. Thank you for the opportunity for do so. The EAC's announcement of the inquiry can be seen at:

<http://www.parliament.uk/business/committees/committees-a-z/commons-select/environmental-audit-committee/inquiries/air-quality-a-follow-up-report/>

2. CAL's mission is to achieve urgently and sustainably at least World Health Organisation (WHO) recommended standards of air quality throughout London. CAL is a non-profit company limited by guarantee, registered in England and Wales, with number 7413769. It is responsible for the Campaign for Clean Air in London. Further details about CAL and its supporters can be found at [www.cleanairinlondon.org](http://www.cleanairinlondon.org).

3. After liaising with other environmental organisations planning to submit evidence to this EAC inquiry, CAL has decided to submit evidence only on the health impacts of air pollution. CAL has not repeated here information in its submission dated 13 December 2009 to the EAC's earlier inquiry into Air Quality. However, it asks the EAC to consider again its recommendations in that submission as the new Government has failed substantially to act on them.

**SUMMARY**

4. Clean Air in London urges the EAC to consider whether the Government is acting in good faith on air quality laws including the: monitoring of air pollution; reporting to the European Commission; and keeping secret ministerial briefing papers relating to legal action. A new national Air Quality Strategy is needed and it should be prepared under the auspices or direct control of the Cabinet Office.

5. Using the same language used for alcoholism, obesity and smoking, the best estimate is that 4,267 deaths in London in 2008 were attributable to long-term exposure to anthropogenic and non-anthropogenic fine particles (PM<sub>2.5</sub>) at an average loss of life for these people of 11.5 years.

6. Following the clarifications in COMEAP's (The Committee on the Medical Effects of Air Pollutants) ground breaking and excellent recent (2010) report on how to express the mortality effects of air pollution, CAL proposes new phrasing to improve the communication of public health risks in general and air pollution in particular. In essence, the estimate of 4,267 deaths in London in 2008 attributable to long-term exposure to PM<sub>2.5</sub> at an average loss of life of 11.5 years is calculated after eliminating the effect of dozens of other possible risk factors (eg educational status as a surrogate for income and smoking) to produce a pure number assuming air pollution is the sole cause of those deaths.

---

<sup>5</sup> Carslaw, D., Beevers, S. Westmoreland, E. Williams, M. Tate, J. Murrells, T. Stedman, J. Li, Y., Grice, S., Kent, A. and I. Tsagatakis (2011). Trends in NOx and NO2 emissions and ambient measurements in the UK. Version: 3rd March 2011. Draft for Comment.

7. The estimate of 4,267 extra or excess deaths is a good one for comparing the effects of air pollution with the effects of other causes such as alcohol, active or passive smoking, obesity, diet etc which are calculated in the same way. However, because in practice individuals experience multiple risks, including air pollution, almost certainly air pollution played some part in shortening the life of a much larger number of individuals in London. It is not possible to estimate that number reliably but given that much of the impact of air pollution on mortality is linked to cardiovascular deaths, it is more reasonable to consider that air pollution may have contributed to all 15,800 deaths due to cardiovascular causes in London [in 2009] (ie one in three of all deaths) at an average additional loss of life for these people of some three years (at typical ages for cardiovascular deaths eg 15% of which are before age 65).

8. World Health Organisation (WHO) guidelines and UK and European legal standards have always addressed exposures and health effects of individual pollutants or indicators (such as PM<sub>10</sub> mass, an indicator of a complex pollution mixture with multiple sources). Achieving guideline concentrations for individual pollutants, such as NO<sub>2</sub>, may therefore bring health benefits that exceed those anticipated on the basis of estimates of a single pollutant's toxicity. London has the highest annual mean concentrations of NO<sub>2</sub> of any capital city in the EU27. NO<sub>2</sub> limit values and deadlines must be complied with in full.

9. Scientific research published since the EAC's last inquiry into air quality has shown that those living near roads travelled by 10,000 or more vehicles per day on average could be responsible for some 15–30% of all new cases of asthma in children; and of COPD (chronic obstructive pulmonary disease) and CHD (coronary heart disease) in adults 65 years of age and older. The same study further estimated that, on average for all 10 cities studied, 15–30% of exacerbations of asthma in children, acute worsening of COPD and acute CHD problems are attributable to air pollution. This burden is substantially larger than previous estimates of exacerbations of chronic diseases, since it has been ignored so far that air pollution may cause the underlying disease as well. Related research indicates that associations of asthma with traffic-related pollution from nearby sources at schools were independent of estimated effects of exposures at homes. CAL has found 1,148 schools in London within 150 metres of such roads and a total of 2,270 within 400 metres.

10. Action must be taken urgently to protect those near living or attending school near the busiest roads. The Government must launch within weeks a massive campaign to build public understanding of the dangers of air pollution with advice on how people can protect themselves (ie adaptation) and reduce air pollution for themselves and others (ie mitigation).

11. We need the Government and Mayor Johnson to play their part in tackling an invisible public health crisis with as many early deaths attributable to air pollution in London in 2008 as we thought occurred during the Great Smog in 1952 (ie 4,267 compared to 4,075). This action must ensure full compliance with air quality laws throughout the UK.

12. CAL has made eight recommendations to the EAC at the end of this submission.

#### *Impact on health from particulate matter and nitrogen dioxide pollution and how they should be measured and communicated*

Warning: CAL has a lay understanding of epidemiology but has made every reasonable effort to ensure the accuracy of its statements on health risks.

#### *Public health risks including alcoholism, obesity and smoking*

13. This section gives an overview of well publicised public health risks such as alcoholism, obesity, road traffic deaths and smoking.

14. *“During the 20th century, the health and life expectancy of persons residing in the United States (US) has improved dramatically. Since 1900, the average lifespan of persons in the United States has lengthened by over 30 years; 25 years of this gain were attributable to advances in public health”*. Source: The Centers for Disease Control and Prevention in an article published in The Journal of the American Medical Association in 1999. See:

<http://jama.ama-assn.org/content/281/16/1481.full>

15. CAL wonders why so much money is spent on pursuing medical advances relative to basic improvements in public health eg air quality.

16. *“Public health experts agree that environmental risks constitute 25% of the burden of disease.”* Source: World Health Organisation, 2011.

17. *“There are between 15,000 and 22,000 alcohol-related deaths every year in England. Most of these deaths are premature: on average, every man in this group loses 20 and every woman 15 years of life compared with the average.”* Source: Department of Health, June 2008.

18. *“Obesity is responsible for 9,000 premature deaths each year in England, and reduces life expectancy by, on average, 9 years”*. Department of Health, September 2007.

**Ev w12 Environmental Audit Committee: Evidence**

19. "Smoking is responsible for 87,000 deaths in England each year." Department of Health, December 2008. "Men who quit smoking by 30 add 10 years to their life." Source: NHS, July 2010.

20. 2,222 people were killed in road traffic accidents in Great Britain in 2009. Source: Department for Transport, 2010.

21. The public health impact for alcoholism, obesity, road traffic deaths and smoking has been well publicised and addressed by massive media campaigns. A massive campaign to build public understanding of the dangers of poor air quality with advice on adaptation and mitigation. It should be similar in scale to those for alcoholism or smoking ie public health risks of similar quantum.

*An introduction by CAL to environmental epidemiology*

22. There are several ambient air pollutants including: nitrogen dioxide (NO<sub>2</sub>); tropospheric ozone (O<sub>3</sub>); particulate matter (ultrafine ie PM<sub>0.1</sub>; fine ie PM<sub>2.5</sub>; coarse ie PM<sub>2.5-10</sub>; and ie PM<sub>10</sub>); sulphur dioxide (SO<sub>2</sub>); and others (eg benzene). The WHO has found no safe level of human exposure to O<sub>3</sub> or PM. In CAL's experience, NO<sub>2</sub> is often confused by commentators with oxides of nitrogen (NO<sub>x</sub>) or nitrous oxide (N<sub>2</sub>O a.k.a. laughing gas).

23. Ambient air pollutants cause and/or exacerbate mortality (early death) and morbidity (illness) and their effects can be acute (ie short-term) and/or chronic (long-term).

24. Size matters since smaller particles penetrate deeper into the lungs and bloodstream. Toxicity matters also so we must be concerned too about larger particles eg coarse particles such as PM<sub>2.5-10</sub>.

25. Time scale matters. The impact of short-term exposure to air pollution is typically assessed through "time series" studies whereas the impact of long-term exposure requires "cohort" studies. The health impact of long-term exposure to air pollution is up to 10 times greater than for short-term exposure.

26. There is an unknown degree of overlap between the health impact of different ambient air pollutants and short and long-term exposure.

27. Air pollution can be "man-made" (ie anthropogenic) or "background" (ie non-anthropogenic). Concentration response functions (CRF a.k.a. hazard rates or relative risks) used for estimating the number of deaths attributable to changes in exposure to air pollution typically use total air pollution (ie anthropogenic and non-anthropogenic). CRFs can be used to assess impact on total mortality and/or type of mortality (eg cardiopulmonary and lung cancer). CRFs usually include a central or "best" estimate and a range. CRFs exist for short-term exposure (eg hourly or daily mean) and long-term exposure (eg annual mean).

28. CRFs for long-term exposure to PM<sub>2.5</sub> are non-linear and assess the impact on those aged 30 and above. Children do not usually appear in mortality statistics for air pollution but do appear in those for other consequences of exposure to air pollution eg reduced lung size.

29. Metrics used for describing the impact of air pollution on public health include: attributable (or premature, extra or excess) deaths; years (of life) lost for the total population; average years (of life) lost per statistical victim (eg 11.5 years); and average for the total population (eg six months). They should be tied to an individual year eg "in 2008" to take account of year to year changes in air pollution and death rates.

*Health impacts attributable to short-term exposure to air pollution*

30. COMEAP published a report titled "Quantification of the Effects of Air Pollution on Health in the United Kingdom" on the health impact of short term exposure to PM<sub>10</sub> in 1998. This reviewed time series studies and took as the relevant CRF an increase of 0.75% in mortality (ie attributable deaths) per 10 microgram per cubic metre (g/m<sup>3</sup>) increase in PM<sub>10</sub> as a 24-hour mean. COMEAP estimated a total of 8,100 deaths "brought forward" due to PM<sub>10</sub> annually among total deaths in urban Great Britain (based on 1995 and 1996 air pollution levels). See:

<http://comeap.org.uk/images/stories/Documents/Reports/exec.summary%20of%20quantification%20of%20health%20effects%20air%20pollution%201998.pdf>

31. The same COMEAP report referred to 3,500 deaths brought forward per year by SO<sub>2</sub> in urban areas of GB and between 700 and 12,500 deaths brought forward by O<sub>3</sub> in both urban and rural GB during the summer only. CRFs were included for those risks too. Ministers, commentators and others have therefore estimated and referred, including as recently as late 2009, to there being 12,300 and 24,100 deaths "brought forward" (or "up to 24,000 deaths") annually in the UK due to air pollution. Of course, given the unknown overlap between effects, the correct range for all these short-term effects is 8,100 to 24,100.

*Health impacts attributable to long-term exposure to PM<sub>2.5</sub>*

32. COMEAP published a ground breaking and excellent report on 21 December 2010 on how to express the mortality effects of air pollution titled "The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom". See:

<http://comeap.org.uk/component/content/article/28-page-linking/128-the-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-uk.html>

<http://comeap.org.uk/images/stories/Documents/Reports/comeap%20the%20mortality%20effects%20of%20long-term%20exposure%20to%20particulate%20air%20pollution%20in%20the%20uk%202010.pdf>

2009 Report:

<http://comeap.org.uk/documents/reports/63-long-term-exposure-to-air-pollution-effect-on-mortality.html>

Further background:

<http://comeap.org.uk/images/stories/Documents/Reports/supporting%20paper%20-%20comeap%20secretariat.pdf>

33. COMEAP was asked to answer in its 2010 report “*If anthropogenic air pollution in 2008 were to be removed and pollution sustained at low non-anthropogenic levels, what would be the benefits in terms of effects on mortality?*”

34. COMEAP concluded “*The current (2008) burden of anthropogenic particulate matter air pollution is, with some simplifying assumptions, an effect on mortality in 2008 equivalent to nearly 29,000 deaths in the UK at typical ages and an associated loss of total population life of 340,000 life-years. The burden can also be represented as a loss of life expectancy from birth of approximately six months. The uncertainties in these estimates need to be recognised: they could vary from about a sixth to double the figures shown.*” See paragraph 2 on pages 1 and 2.

35. COMEAP went on to say “*It is not known how this population-wide burden is spread across individuals in the population, but we can speculate between various possibilities. Our results are consistent with an average loss of life ranging at one extreme from 11 ½ years if air pollution was solely responsible for 29,000 deaths to, at the other extreme, six months if the timing of all deaths was influenced by air pollution. We believe both of these extremes to be extremely unlikely. Given that much of the impact of air pollution on mortality is linked to cardiovascular deaths, it is more reasonable to consider that air pollution may have made some contribution to the earlier deaths of up to 200,000 people in 2008, with an average loss of life of about two years per death affected, though that actual amount would vary between individuals. However, this assumption remains speculative.*” See paragraph 21 on page 5.

36. CAL understands that the figure of 200,000 was based on there being 190,857 deaths at all ages in 2008 due to all diseases of the circulatory system (including coronary heart disease (88,236), stroke (43,142) and other diseases of the circulatory system (59,479)) in the United Kingdom. There were 579,677 deaths in total from all causes in the United Kingdom in that year.

37. COMEAP used an annual mean population-weighted anthropogenic PM<sub>2.5</sub> for the UK in 2008 of 8.97 g/m<sup>3</sup> (based on a total of 10.39 g/m<sup>3</sup> and non-anthropogenic of 1.42 g/m<sup>3</sup>). Defra’s Air Quality Strategy 2007 estimated annual mean population-weighted anthropogenic PM<sub>2.5</sub> in the UK in 2005 was 10.144 g/m<sup>3</sup> (gravimetric) (based on non-anthropogenic PM<sub>2.5</sub> in 2005 of 3.37 g/m<sup>3</sup>).

38. Based on the latest COMEAP advice, CAL estimates there were between 29,000 and 53,100 deaths in the UK attributable to anthropogenic air pollution in 2008 assuming either full or no overlap respectively between the health impacts of short and long-term exposure to different ambient air pollutants.

*London health impacts attributable to long-term exposure to PM<sub>2.5</sub>*

39. The Mayor’s Air Quality Strategy says that road transport is the main source of PM<sub>2.5</sub> emissions in London, contributing 80% in 2008 (and 79% of PM<sub>10</sub> in Central London) (pages 38 to 41). The Department for Transport has said that road transport is responsible for up to 80% of NO<sub>2</sub> in large urban areas.

40. On 29 June 2010, the Mayor of London published a report titled “Report on estimation of mortality impacts of particulate air pollution in London”. It estimated there were 4,267 deaths in Greater London in 2008 attributable to long-term exposure to anthropogenic and non-anthropogenic PM<sub>2.5</sub> with a range of 756 to 7,965. The calculations were based on annual mean concentrations of PM<sub>2.5</sub> in London in 2006 and mortality in London in 2008, both by ward. The Mayor of London has shown an inadequate understanding of the impact and the excellent health study by saying in his Air Quality Strategy “*around 4,300 deaths per year in London are partly caused by long-term exposure to PM<sub>2.5</sub>*” [CAL emphasis]. The full health study by the Institute of Occupational Medicine can be seen at:

[http://www.london.gov.uk/sites/default/files/Health\\_Study\\_%20Report.pdf](http://www.london.gov.uk/sites/default/files/Health_Study_%20Report.pdf)

41. CAL aggregated the ward statistics to calculate totals by borough. These can be seen at:

[http://www.cleanairinlondon.org/\\_attachments/4566108/CCAL%20098%20CCAL%20provisional%20analysis%20by%20borough%20300610%20V2.pdf](http://www.cleanairinlondon.org/_attachments/4566108/CCAL%20098%20CCAL%20provisional%20analysis%20by%20borough%20300610%20V2.pdf)

42. There were 15,816 deaths in Greater London in 2009 due to diseases of the circulatory system out of a total of 48,155 deaths from all causes, at ages 28 days and over. See Table 2 from “Deaths: numbers by age, sex and selected underlying cause, 2009” via:

**Ev w14** Environmental Audit Committee: Evidence

<http://www.statistics.gov.uk/statbase/product.asp?vlnk=15229>

43. Of the 15,816 deaths, the cumulative percentages of deaths by age band were: under 34 (0.7%); 35–44 (2.2%); 45–54 (6.0%); 55–64 (13.8%); 65–74 (28.5%); 75–84 (60.2%); and 85 and over (100%). These might be termed the typical ages for deaths attributable to diseases of the circulatory system.

44. Using its understanding of the approach adopted by COMEAP for the national calculations, CAL calculates that the average additional loss of life for cardiovascular deaths in London is calculated as  $(4,267 \times 11.5)/15,816 = 3.1$  years.

45. Borough by borough numbers for the number of early deaths due to heart attacks and strokes (ie not including “other diseases of the circulatory system”) in London in 2010 can be found at:

<http://www.apho.org.uk/resource/view.aspx?RID=50215&REGION=50156&SPEAR>

*Comparing health impacts during the Great Smog in 1952 and now*

46. According the BBC, the Department of Health estimated there were 4,075 deaths attributable to short-term exposure to air pollution during the Great Smog in December 1952. The Environment Agency and the Met Office both also refer to 4,000 additional deaths during the Great Smog of 1952:

<http://news.bbc.co.uk/1/hi/england/2545759.stm>

[http://www.metoffice.gov.uk/education/teens/casestudy\\_great\\_smog.html](http://www.metoffice.gov.uk/education/teens/casestudy_great_smog.html)

47. We did not know in 1952 about the dangers of long-term exposure to air pollution. These impacts have only been known and quantified since the 1990s and later as a result of large cohort studies.

48. We need the Government and Mayor Johnson to play their part in tackling an invisible public health crisis with as many early deaths attributable to air pollution in London in 2008 as we thought occurred during the Great Smog in 1952 (ie 4,267 compared to 4,075).

*Communicating the impact of long-term exposure to PM<sub>2.5</sub>*

49. At the Care4Air conference in Sheffield on 22 September 2010 a survey was undertaken which showed 88.9% of attendees “Would like to see an estimate for the number of premature deaths due to long-term exposure to fine particles for [their] area (ie like London)” and 93.3% of attendees “Would welcome official guidance on the careful interpretation of health impact metrics such as ‘premature deaths’ and ‘years of life lost?’”.

50. Years of life lost (YLL) (or Disability Adjusted Life Years (DALYs) which are more commonly used in the United States) and its monetary equivalent are the best metrics for policy makers, economists and scientists to use to evaluate the health impact of measures to reduce air pollution (eg low emission zones). Clearly legal deadlines must also be met.

51. Using the same language used for alcoholism, obesity and smoking, the best estimate is that 4,267 deaths in London in 2008 were attributable to long-term exposure to anthropogenic and non-anthropogenic fine particles (PM<sub>2.5</sub>) at an average loss of life for these people of 11.5 years.

52. Following the clarifications in COMEAP’s ground breaking and excellent recent (2010) report on how to express the mortality effects of air pollution, CAL proposes new phrasing to improve the communication of public health risks in general and air pollution in particular. In essence, the estimate of 4,267 deaths in London in 2008 attributable to long-term exposure to PM<sub>2.5</sub> at an average loss of life of 11.5 years is calculated after eliminating the effect of dozens of other possible risk factors (eg educational status as a surrogate for income and smoking) to produce a pure number assuming air pollution is the sole cause of those deaths.

53. The estimate of 4,267 extra or excess deaths is a good one for comparing the effects of air pollution with the effects of other causes such as alcohol, active or passive smoking, obesity, diet etc which are calculated in the same way. However, because in practice individuals experience multiple risks, including air pollution, almost certainly air pollution played some part in shortening the life of a much larger number of individuals in London. It is not possible to estimate that number reliably but given that much of the impact of air pollution on mortality is linked to cardiovascular deaths, it is more reasonable to consider that air pollution may have contributed to all 15,800 deaths due to cardiovascular causes in London [in 2009] (ie one in three of all deaths) at an average additional loss of life for these people of some three years (at typical ages for cardiovascular deaths eg 15% of which are before age 65).

*Importance of nitrogen dioxide*

54. An “Update of WHO air quality guidelines” was published in February 2008. That confirmed the Air Quality Guideline (AQG) value for nitrogen dioxide (NO<sub>2</sub>) as an annual mean of 40 g/m<sup>3</sup> and a one hour mean of 200 g/m<sup>3</sup>. It said “*The AQG have always addressed exposures and health effects of individual pollutants or indicators (such as PM<sub>10</sub> mass, an indicator of a complex pollution mixture with multiple sources). However, as understanding of the complexity of the air pollution mixture has improved, the limitations of controlling air pollution and its risk through guidelines for single pollutants have become increasingly apparent. Nitrogen*

---

*dioxide (NO<sub>2</sub>) for example is a product of combustion processes and is generally found in the atmosphere in close association with other primary pollutants, including ultrafine particles. It is itself toxic and is a precursor of ozone, with which it coexists along with a number of other photochemically generated oxidants. Concentrations of NO<sub>2</sub> are often strongly correlated with those of other toxic pollutants. Its concentration is readily measured but needs interpretation as a potential surrogate for a set of sources and the resulting mixture. Achieving guideline concentrations for individual pollutants, such as NO<sub>2</sub>, may therefore bring health benefits that exceed those anticipated on the basis of estimates of a single pollutant's toxicity." See:*

<http://www.springerlink.com/content/943153q7637737t0/fulltext.pdf>

55. CAL urges the EAC to reject any suggestion from the Government that the NO<sub>2</sub> limit values, which are the same as the AQG values above except that the former allow 18 hours over 200 g/m<sup>3</sup> in a year instead of being an "absolute" level, are not important for the protection of human health.

#### INCREASED HEALTH RISKS FOR THOSE LIVING OR ATTENDING SCHOOL WITHIN 150 METRES OF BUSY ROADS

56. CAL participated in the final stakeholder meeting of the Aphekom project on 2 March 2011. At that meeting the results of work by 60 scientists in 12 European cities over three years was presented and discussed. See:

<http://www.aphekom.org/web/aphekom.org/home>

[http://www.aphekom.org/c/document\\_library/get\\_file?uuid=5532fafa-921f-4ab1-9ed9-c0148f7da36a&groupId=10347](http://www.aphekom.org/c/document_library/get_file?uuid=5532fafa-921f-4ab1-9ed9-c0148f7da36a&groupId=10347)

57. Aphekom determined that, on average, over 50% of the population in the 10 European cities studied lives within 150 metres of roads travelled by 10,000 or more vehicles per day and could thus be exposed to substantial levels of toxic pollutants. In the cities studied, the Aphekom Health Impact Assessment showed that those living near these roads could be responsible for some 15–30% of all new cases of asthma in children; and of COPD (chronic obstructive pulmonary disease) and CHD (coronary heart disease) in adults 65 years of age and older. Aphekom further estimated that, on average for all 10 cities studied, 15–30% of exacerbations of asthma in children, acute worsening of COPD and acute CHD problems are attributable to air pollution. This burden is substantially larger than previous estimates of exacerbations of chronic diseases, since it has been ignored so far that air pollution may cause the underlying disease as well.

58. In addition, for the population studied Aphekom estimated an economic burden of more than Euro 300 million every year attributable to chronic diseases caused by living near heavy traffic. This burden is added to some Euro 10 million attributable to exacerbations of these diseases. Aphekom went on to comment "*Our work suggests the total benefits of reducing traffic exposure for urban populations may have been largely underestimated until now*".

59. The Aphekom team highlighted new evidence from the United States published in a scientific study titled "Childhood Incident Asthma and Traffic-Related Air Pollution at Home and School" (Rob McConnell et al in "Environmental Health Perspectives" on 6 April 2010). The study was unique in its prospective assessment of the relationship of new-onset childhood asthma to community regional air pollution and near-source traffic-related exposure at home and in a large number of schools. The results indicate that associations of asthma with traffic-related pollution from nearby sources at schools were independent of estimated effects of exposures at homes.

60. CAL submitted an information request to Transport for London (TfL) under the Environmental Information Regulations for details of schools within 150 metres of roads in London carrying over 10,000 vehicles per day on average. CAL also asked for details of those within 400 metres of such roads. TfL's reply identified 1,148 schools within 150 metres and a total of 2,270 schools within 400 metres of these busy roads. The list of those schools is attached separately as evidence for the EAC.

61. CAL had previously obtained from TfL details of schools within 150 metres and 400 metres of roads carrying over 100,000 vehicles per day on average. TfL's reply showed 13 schools within 150 metres and 75 in total within 400 metres of such roads. The list of schools is attached separately as evidence for the EAC.

62. CAL had requested the information about schools near roads carrying over 100,000 vehicles per day on average to inform its submission to the Examination in Public (EiP) for the Draft Replacement London Plan. In its submission to the EiP, CAL said "*EU air quality laws highlight the need to protect "sensitive populations" such as children and the elderly. Scientific research in the US has linked proximity to road traffic to lower lung growth in young children. Standards exist in the US to protect children at schools from harmful emissions (eg California Education Code Section 17213 which requires [broadly] that the governing body of a school district may not approve a project involving the acquisition of a schoolsite by a school district unless inter alia: strict assessments are made if the proposed schoolsite would be within one-fourth of a mile [c 400 metres] of a freeway or other busy traffic corridor, large agricultural operations or railyard; and for a schoolsite with a boundary that is within 500 feet [150 metres] of the edge of the closest traffic lane of a freeway or other busy traffic corridor, the governing body of the school district determines, through analysis based on appropriate air dispersion modelling, and after considering any potential mitigation measures, that the air quality at the proposed site is such that neither short-term nor long-term exposure poses significant*

**Ev w16 Environmental Audit Committee: Evidence**

*health risks to pupils. "Freeway or other busy traffic corridor" is defined as "those roadways that, on an average day have traffic in excess of 50,000 vehicles in a rural area and 100,000 vehicles in an urban area")."*

**RECOMMENDATIONS**

63. CAL makes the following eight recommendations to the EAC.
64. Consider whether the Government is acting in good faith on air quality laws including the: monitoring of air pollution; reporting to the European Commission; and keeping secret ministerial briefing papers relating to legal action. CAL has previously written to the EAC on this subject.
65. Condemn the Government for still not publishing for consultation its draft time extension notification (TEN) for NO<sub>2</sub> which must be consulted upon and submitted to the European Commission by 30 September 2011. This consultation has been "work in progress" for well over two years and yet stakeholders seem set to be "bounced" into a shortened, last minute, summer consultation. Perhaps as seriously, it seems the Government may be "playing games" with the EAC by planning to publish the TEN just days after the closing date for evidence to be submitted to the EAC.
66. CAL reiterates the recommendations it submitted to the EAC in December 2009 since there is little or no evidence the Government has yet acted upon them.
67. Insist the Government publishes for every local authority in the UK an estimate of the number of deaths attributable to long-term exposure PM<sub>2.5</sub> together with the number of deaths due to cardiovascular causes. These should: follow the form of the excellent report by the Institute for Occupational Medicine for London (ie including ranges); use the new phrasing recommended by CAL (see paragraphs 51 to 53 above); and be accompanied by careful guidance on the interpretation of these metrics provided recently by COMEAP.
68. The Government should be told to produce a new national Air Quality Strategy (AQS) as a matter of urgency. This should be done under the auspices or direct control of the Cabinet Office.
69. CAL urges the EAC to recommend a requirement under UK planning law to protect sensitive populations (eg children and the elderly) from air pollution. This should build upon the standards applying in California (see paragraph 62 above). The new AQS should address the need to monitor ultrafine particles.
70. The Government must commit to comply fully now with air quality laws. The coalition's vision of "working towards" such compliance is meaningless and the lack of appropriate targets in Defra's Business Plan is a scandal.
71. Last but not least, the Government should launch immediately a massive campaign to build public understanding of the dangers of air pollution with advice on how people can protect themselves (ie adaptation) and reduce air pollution for themselves and others (ie mitigation). The build up to the 2012 Olympic and Paralympic Games offers a tremendous initial focus for such a campaign.
72. Government communications describing other public health risks should be improved to match that proposed now for air pollution and informed by the excellent recent COMEAP report on the subject.

30 May 2011

---

**Written evidence submitted by JouleVert Ltd****EXECUTIVE SUMMARY**

- Cars driven by electricity will have zero PM and NO<sub>x</sub> at point of use *but* assessment should be made on how the electricity is produced and the resultant PM and NO<sub>x</sub> emissions.
- Electric Vans will have limited capability and load restrictions.
- Vans, Trucks and Buses should be encouraged to use natural gas and ultimately Biomethane as their fuel as this give virtually zero PM and considerably lower NO<sub>x</sub> (plus lower noise) which is vital in our city centres.
- The Haulage industry will deliver vastly improved air quality and have better and lower fuel price stability with Natural Gas provided the Government puts in place a long term (10 year plus) beneficial fuel duty regime.
- Dedicated Natural Gas trucks, buses and vans deliver the benefits wherever they are used and require little change in vehicle usage patterns.
- Dual Fuel trucks (particularly Articulated units) give the range and usage pattern needed for city to city long haul.
- The French Government has allowed vans rated at 3.5te to run at 3.8te if they have natural gas fuel tanks (which weigh more than a diesel tank) so that the operator is not penalised for choosing a cleaner fuel. The UK Government needs to follow suit.

---

**SUBMITTER'S DETAILS**

JouleVert has specialist knowledge of both UK and global vehicle markets with particular emphasis on developing Biofuels, LPG and Natural Gas/Biomethane in the UK.

**SUBMISSION**

1. Diesel vehicle in real life do not achieve the PM and NO<sub>x</sub> levels that the EU drive cycles state. This is due to the real life drive patterns and therefore New Real life drive cycles need to be developed. Trucks and buses need to have real life drive cycle tests developed rather than the current "engine only" tests.

2. Self certification of vehicles by manufacturers needs to be supplemented by independent verification.

3. Diesel trucks, buses and vans account for 25% of the UK's Liquid fuel use (and 50% of diesel usage) yet are less than 10% of the vehicle parc. Trucks are only 2% of the vehicle park and buses less.

4. Electric vehicles—Cars driven by electricity will have zero PM and NO<sub>x</sub> at point of use *but* assessment should be made on how the electricity is produced and the resultant PM and NO<sub>x</sub> emissions. Electric Vans will have limited capability and load restrictions. Topography along with the use of wipers, lights and use of heater can reduce the potential mileage by 40%. Electric trucks will not happen—an articulated truck would need 36 tonnes of batteries to do the same job as existing trucks therefore no room for the goods!!

5. Vans, Trucks and Buses should be encouraged to use natural gas and ultimately Biomethane as their fuel as this give virtually zero PM and considerably lower NO<sub>x</sub> (plus lower noise) which is vital in our city centres. Natural Gas is a much more abundant fuel than petrol and diesel. European refineries are diesel constrained—we rely on imports of diesel from the USA and Russia. USA is starting a dieselisation programme which will result in further constraints on supply and thus price rises for diesel. The Haulage industry will have better and lower fuel price stability with Natural Gas provided the Government puts in place a long term (10 year plus) beneficial fuel duty regime. Dedicated Natural Gas trucks, buses and vans deliver the benefits wherever they are used and require little change in vehicle usage patterns. Dual Fuel trucks (particularly articulated units) give the range and usage pattern needed for city to city long haul. Dedicated Natural gas trucks could be made to have payback inside 3 years if the right duty levels were set.

6. The French Government has allowed vans rated at 3.5te to run at 3,8te if they have natural gas fuel tanks (which weigh more than a diesel tank) so that the operator is not penalised for choosing a cleaner fuel. The UK Government needs to follow suit.

7. Hybrid trucks have a current payback of over 15 years as they are only effective in stop start low mileage city work.

**RECOMMENDED ACTION:**

1. A clear strategy to encourage the switch over of Commercial vehicles (Vans, Buses and trucks) onto Natural Gas fuelling (and ultimately Biomethane) through a 10 year plus fixed fuel duty regime.

2. 33% reduction in VED rates for Commercial vehicles running on Natural Gas fuel.

3. 100% first year capital allowance for additional cost for Natural gas fuelled vehicles.

4. Addition of 300kg to the limits on Gross Vehicle Weight for Natural Gas fuelled vans at 3.5te to ensure no penalty for choosing a cleaner fuel.

5. Full "well to wheels" Carbon and air quality effects need to be introduced to ensure the deliverability for carbon and Air Quality reductions.

*1 June 2011*

---

**Written evidence submitted by the Chartered Institution of Water and Environmental Management (CIWEM)**

CIWEM welcomes the opportunity to provide written evidence to the Environmental Audit Committee follow up report on air quality. This response has been prepared by CIWEM's Air Panel which comprises academics and practitioners working in the air quality field. It addresses the key themes of the Committee's inquiry and concentrates on policy approaches to improve air quality.

**SUMMARY**

I. CIWEM believes that the UK's Air Quality Strategy needs to be based on good evidence and be reactive to new evidence. However, it is difficult to identify the benefits of the 2007 Air Quality Strategy, despite the huge amount of analysis that went into it. We believe that the wrong tool was used (cost- benefit analysis not cost-effective analysis).

**Ev w18 Environmental Audit Committee: Evidence**

II. Improvements to urban air quality are not occurring at the rate previously assumed, and the Government does not appear to have responded quickly to new evidence, possibly due to the emphasis put on mitigating climate change.

III. It is unlikely that air quality will be given sufficient priority with the proposed localism agenda. Central government will have to continue to provide leadership, over-sight, guidance and financial support if we are to see a real improvement in air quality.

**BACKGROUND**

1. In December 2009 CIWEM responded to the Environmental Audit Committee's last call for evidence on air quality, and we consider little has changed since the new Government came to power in May 2010. We were pleased that the Government included meeting the EU air quality limit values in the Coalition Agreement, and that the Government has accepted that marginal cost curves (cost-effectiveness analysis not cost benefit analysis), are the most appropriate way to prioritise measures to reduce air pollution. Interestingly, the Defra website currently provides information on cost-benefit analysis not cost effectiveness, despite their response to the Committee's last report. We would like to see the full results of a cost-effectiveness analysis in a new Air Quality Strategy that reflects the current Government's views.

2. CIWEM continues to believe that the priority given to climate change, as an isolated issue, has meant that too little emphasis has been given to improving air quality, despite evidence of the significant impacts. We currently experience poor air quality in excess of the EU limit values for one or more pollutant, in many of our towns and cities. We also widely exceed the EU critical levels and the UNECE loads, set for the protection of vegetation and ecosystems. This is not to say that improving air quality is more important than addressing climate change, but that they are both important. Many, with a few important exceptions, of the mitigation measures address both air pollution and greenhouse gas emissions.

3. In our evidence we have concentrated on policy approaches to improve air quality, on the assumption that others, better qualified than us, will provide evidence on the health and environmental impacts. Although the health impacts are very important, we would urge the Committee to also give due consideration to the impacts of the deposition of air pollution on ecosystems, and the impacts of carbon (black smoke) on soiling of surfaces.

4. It is interesting to note that the United States is putting much more emphasis on PM<sub>2.5</sub> than the EU. They have had a 24-hour standard of 35 µg/m<sup>3</sup> and an annual mean standard of 15 µg/m<sup>3</sup> since 1997 and 2006 respectively. This compares with an EU annual mean value of 25 µg/m<sup>3</sup> to be achieved by 2015 and 20 µg/m<sup>3</sup> by 2020, as well as an exposure reduction target. There is no limit value for daily exposure to PM<sub>2.5</sub>. The 2007 UK Air Quality Strategy, which pre-dated the 2008 EU CAFE Directive has less stringent targets. We believe that the health evidence supports more policy emphasis being put, in the UK and beyond into the EU /UNECE, on controlling emissions that contribute to ambient concentrations of these small particles.

5. We believe that this Government, and the previous one, have been too slow to respond to new scientific evidence. For example, we have known for several years that annual mean nitrogen dioxide (NO<sub>2</sub>) concentrations at many roadside locations have not been declining at the rate forecast by modelling, and that they are actually increasing in some locations, yet no policies have been introduced to specifically address this issue. In fact, the favouring of diesel cars, using differentiated vehicle excise duty, may have played a part in increasing new diesel sales, and slowing or reversing the reduction trends in road transport emissions of nitrogen oxides (NO<sub>x</sub>).

**THE CAUSES OF PARTICULATE MATTER AND NITROGEN DIOXIDE (NO<sub>2</sub>) AIR POLLUTION**

6. The main source of nitrogen oxides (typically considered to be nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO)) impacting on local air quality is road transport. Although power stations and industrial, commercial and institutional boilers can also give rise to significant quantities of emissions, these are generally emitted at some height above ground level, and are typically diluted before their plumes reach to where people are exposed.

7. NO<sub>2</sub> is both a primary pollution (i.e. directly emitted into the atmosphere) and a secondary pollutant (i.e. formed in the air as a result of chemical reactions). These higher level emissions are more important with respect to regional scale pollution and contribute to the formation of secondary particles.

8. The sources of particulate matter (PM) in the atmosphere are more diverse, with combustion sources being an important source of primary PM. However there are other sources of primary PM including non-exhaust road transport (tyre and road wear; re-suspension of deposited dust on roads), as well as contributions from demolition and construction sites, quarries, waste management facilities, agriculture. The latter sources tend to be bigger particles than those from combustion sources (PM<sub>10-2.5</sub>).

9. PM is also formed in the atmosphere from primary emissions of NO<sub>x</sub>, sulphur oxides (SO<sub>x</sub>), volatile organic compounds (VOCs) and ammonia. NO<sub>x</sub> and SO<sub>x</sub> are emitted primarily from the combustion of fossil fuels, but the main source of ammonia is agriculture. VOCs are emitted from a wide range of sources including road vehicles, evaporation of fuels, industrial processes and the use of solvents and products. These secondary particles are initially extremely small, but grow over time, and make a significant contribution to PM<sub>2.5</sub>/PM<sub>10</sub>

---

concentrations. Controlling these PM precursors must be an important part of any strategy to control ambient PM concentrations.

10. We believe that it is important to define the type of particles that have the greatest impact on health, their relative importance and our ability to control them. Thus there should be a differentiation between natural PM, such as sea spray containing sea-salt particles, for which there is little evidence of a health impact and no possibility of controlling them, and combustion derived particles.

11. There has been a debate regarding the health impacts of NO<sub>2</sub> vs. PM, with more emphasis being put on reducing NO<sub>2</sub> concentrations despite there being stronger evidence of the health impacts of PM<sub>10</sub>/PM<sub>2.5</sub>. However, NO<sub>x</sub> control is important because it is a precursor of both PM and NO<sub>2</sub> and contributes to acidification, eutrophication and ozone pollution.

#### EFFECTIVENESS OF THE GOVERNMENT'S STRATEGY FOR IMPROVING AIR QUALITY

12. Control strategies for primary and secondary pollutants are very different. For primary pollutants there is a relatively simple relationship between reducing emissions and ambient concentrations. If emissions are reduced the long term average concentrations will also be reduced more or less in proportion. However, for some secondary pollutants the relationship is very complex, with a large number of intermediate chemical species being formed in polluted air that influence the ambient concentrations of secondary PM and NO<sub>2</sub>. Detailed understanding of these interactions is needed to devise effective control strategies. Experience from controlling ozone pollution has shown that adopting the wrong strategy can result in increased concentrations in some locations.

13. Robust modelling is a vital component of good air quality policy making. Broadly there are two types of modelling: emission modelling and air quality modelling. A recent report<sup>6</sup> for Defra has suggested that despite a series of increasingly stringent emissions standards there has been no discernable improvement in on-road emissions from diesel cars, and with diesel cars making up approximately 50% of new car sales this is very worrying. The same research provides evidence that the assumed vehicle-kilometres driven by vehicles of different ages in the National Atmospheric Emission Inventory (NAEI) is wrong. More kilometres seem to be driven by older vehicles than assumed. In addition, the first generations of catalyst equipped petrol cars are not performing as well as anticipated. This has not been fully accounted for in the NAEI, although preliminary analysis of the impact of this research has been undertaken.

14. Both the previous and current UK Governments have depended on relatively simple computer models to predict the impact of changes in emissions on air quality. The impact of future emissions scenarios and policy measures on air quality have been largely assessed using the Pollution Climate Mapping (PCM). This is not a dispersion model. Instead, it is based on the empirical relationships between emissions and ambient air quality in different locations. If the emission inventory is wrong or the relationship between emissions and air quality changes (e.g. due to different ozone concentrations or changing climate), the PCM will not provide the correct results.

15. The Government's strategy for improving air quality does not directly take account of the complexities of secondary pollutants alluded to above. Recent research commissioned by Defra suggests that this model does not adequately represent measured concentrations of NO<sub>2</sub>.

16. We have known for years that roadside NO<sub>2</sub> concentrations are not declining in-line with the predictions, and that diesel cars emit more NO<sub>x</sub> and PM than petrol cars, yet diesel cars are being promoted due to their fuel economy/CO<sub>2</sub> benefits. This is one of the examples where policies to mitigate climate change are not complementary with the protection of air quality. Another example is the promotion of new large boilers/CHP units, often fuelled with biomass, as part of the planning process for large inner-city developments. This brings additional emissions into cities where people are already exposed to poor air quality. The Mayor of London is addressing this by requiring new boilers to meet defined emission limits.

17. There are however, many opportunities to improve air quality and mitigate climate change. It appears from the outside that DECC does not consider air quality or even treats it as a barrier to CO<sub>2</sub> reduction, whereas there are many opportunities both in terms of benefits and getting political and public buy-in.

18. As mentioned in our previous evidence to the Committee the current methods of modelling air quality at a national level cannot take account of local characteristics (particularly street canyons in small market towns), with the consequence that poor air quality in some areas is being inadequately taken into account in national decision-making. A mechanism to account for significant local issues needs to be built into a more robust decision making process.

19. The 2007 Air Quality Strategy assessed a range of air quality measures based on their cost effectiveness. This, as we have highlighted previously, is the wrong approach and it means that some measures have been ruled out. As the UK Government is committed to meeting the EU air quality limit values these measures urgently need to be re-assessed using marginal cost curves to identify the best package of measures to reduce air quality to acceptable levels.

---

<sup>6</sup> Carslaw, D., Beevers, S. Westmoreland, E. Williams, M. Tate, J. Murrells, T. Stedman, J. Li, Y., Grice, S., Kent, A. and I. Tsagatakis (2011). Trends in NO<sub>x</sub> and NO<sub>2</sub> emissions and ambient measurements in the UK. Version: 3rd March 2011. Draft for Comment.

**Ev w20 Environmental Audit Committee: Evidence**

---

20. The measures in the 2007 Air Quality Strategy focused on new vehicle emission standards, low emission zones, incentivising low emission vehicles, introducing new emission limits for medium combustion plant (20–50MW), and reducing VOC emissions. The cost-benefit analysis resulted in some of these measures being dismissed, while for others the strategy stated that they will be assessed further. We are unsure as to what the current Government's air quality strategy is, but believe it focuses on local measures.

21. It is our opinion that the 2007 Air Quality Strategy has not resulted in significant improvements in ambient air quality, and that new measures are required to ensure the EU ambient limit values/critical levels are achieved. It is likely that more of the national measures in the 2007 Air Quality Strategy will need to be implemented. The serious failure of recent EU Directives to control real world vehicle emissions urgently needs to be addressed. This includes the use of selective catalytic reduction (SRC) on heavy duty vehicles in urban areas, as well as other diesel vehicles<sup>7</sup>. Until these issues are addressed we consider incentives to promote the use of diesel cars should be removed. If low emission zones are developed they should be designed to promote the use of small petrol/hybrid/electric cars.

22. CIWEM believes that Defra will not be able to improve our air quality without the political buy-in of other Government departments and agencies; including the Department for Transport, Department for Communities Local Government and the Highways Agency.

23. For stationary sources, from our experience, there are a number of operators who are providing back-up power for the national grid using old diesel generators, close to the limit for an Environmental Permit, which are emitting high levels of NO<sub>x</sub>. These electricity generating plants should be included in the Environmental Permitting Regulations. Further consideration should be given to reducing emissions from medium combustion plants. Again, based on our experience, there is a need for the Environment Agency to regulate the emissions of VOCs more diligently, as there is evidence that some manufacturers' VOC Management Plans/mass balance calculations are inadequate.

*Potential effects of the Government's localism agenda and proposed reforms of public health provision on local authorities' capacity for tackling poor air quality*

24. We are concerned that the Government's localism agenda will result in more emphasis being put on popular local policies to the detriment of policies, such as improving air quality that have largely invisible benefits.

25. We consider that at a time of reducing public expenditure, air quality will be in competition with other vital services such as education, transport and social care, and it is likely that environmental protection will lose out. In recent years most environmental protection departments have had relatively little influence in local authority policies and priorities compared to the higher budget departments. As poor air quality cannot be seen and generally cannot be smelt people are unaware when or where concentrations are elevated. Even people with respiratory disease do not always recognise that their symptoms are related to poor air quality. In the absence of any vocal pressure group lobbying for clean air it is very difficult to see how air quality will ever be a local priority.

26. Without direct government support, such as the Air Quality Grants Programme, there are unlikely to be sufficient resources for local authorities to improve in air quality.

27. The Local Air Quality Management regime has been very successful in developing an understanding of local issues; however we consider that the adopted air quality action plans have largely been ineffective. There has been no political will in most local authorities (London being a notable exception) to introduce measures that are very expensive (and generally most effective) or are perceived as being unpopular with motorists. The only way to materially improve air quality is for there to be a very significant reduction in road traffic. Discussions on road/congestion pricing have shown that a fiscal approach is hugely unpopular, and neither central nor local government is not likely to introduce such an unpopular measure.

28. Low emission zones (LEZs) are, unfortunately, associated with road charging, and are also unlikely to be promoted locally without a powerful (and very vocal) local lobby. The recent research on emissions from diesel cars and lorries with selective catalytic reduction, suggests that it might be difficult to design an effective LEZ. If local authorities do implement LEZs it is vital that central government provides good and consistent guidance on the criteria to be used to define low emission vehicles.

29. Most air quality action plans include a wide range of "soft" measures that are relatively cheap to implement. These typically include measures to promote more sustainable transport modes, which might be effective in the long term but do not reduce road transport significantly in the short term to ensure air quality standards are achieved.

30. To achieve the mandatory EU limit values within a defined timeframe, it is important that the central government maintains a leadership role, continues with the over-sight of Local Air Quality Management, and drives improvements effectively. If action is required at the local level, central government will need to continue to provide good guidance and financial support. One way to do this would be to prioritise central government

---

<sup>7</sup> Williams, M.L., Carslaw, D.C., New Directions: Science and policy—Out of step on NO<sub>x</sub> and NO<sub>2</sub>?, Atmospheric Environment (2011), doi:10.1016/j.atmosenv.2011.04.067

transport grants based on environmental improvements, using more sophisticated criteria than in the Highway Agency's current Design Manual for Roads and Bridges (DMRB).

31. The Department for Communities and Local Government has published a list of local authority duties, including those under Defra's remit, for review. CIWEM believes that all of the air quality regulations are all essential to ensure adequate protection of air quality, the environment and local amenity.

1 June 2011

---

### Written evidence submitted by CNG Services Ltd

This CNG Services Ltd (CSL) response focuses on the use of natural gas as a vehicle fuel as a means to improve air quality.

1. The UK economy was converted to natural gas in the 1970's on the back of North Sea reserves. The use of oil in British industry was dramatically reduced in the period 1970—1990 as industry converted to gas and as a result oil is now predominately used for transport. The conversion to natural gas was the main reason for significant improvements in air quality in our cities in the period 1960–80

2. Overseas BG Group is making investment in relation to NGVs (Brazil, Argentina, India, Kazakhstan) as the world sees huge growth in NGVs. When British Gas worked on it in 1992 there were around 10,000 vehicles in the world running on natural gas. By 2002 this had grown towards 1 million. But by 2012 there is forecast to be 15 million, this is significant growth.

3. The German Government fixed CNG fuel duty in 2001 at the EU minimum level (6 p/kg) for 20 years on the basis that the gas industry would build CNG filling stations and the car industry will develop CNG cars (note—in the same period duty in the UK has risen from 9p/kg to 28p/kg today). Reference 2 shows EU and Worldwide NGV Statistics.

4. This strategy has been successful in that in Germany there are now 900 CNG filling stations and around 100,000 cars and vans running on CNG from the grid.

5. Most major cities now run their buses on natural gas for air quality reasons (Los Angeles has all 9,000 buses on CNG, no diesel)

6. But what of the UK? In 2002 there were around 20 CNG filling stations operational in the UK but now there are no grid connected public access stations that are capable of "fast filling" a vehicle.

7. In terms of vehicles there are estimated to be around 50 vehicles running on CNG and 200 running on natural gas stored on board as LNG, with fuel mostly provided at a small number of depot-based filling stations.

8. The sector of interest for natural gas is the commercial vehicle sector and buses. There are around 700,000 vans, rigid trucks and tractors operating in the UK and a large proportion of these operate from depots. As such, they are well suited to running on natural gas as the gas grid is invariably close by. The most significant technological development is in relation to the engine and fuel combination. Reference 4 shows that 18% of transport emissions come from trucks.

9. If air quality is the driver (nitrous oxides and particulates) then having an engine that runs on 100% natural gas gives exceptional performance. This is why most Los Angeles buses run on CNG (9,000) and all 670 refuse trucks in Madrid run on CNG. There are now no longer any diesel buses operating in LA City nor any diesel refuse trucks in Madrid. CNG is the fuel of choice where air quality is a major issue. Whilst air quality is an issue in the UK, the driver for change is now reduction in CO<sub>2</sub>. Reference 5 shows LA buses and Reference 6 shows the benefits of the CNG refuse trucks in Madrid.

10. We do not believe that diesel vehicles achieve the PM and NO<sub>x</sub> levels that the EU drive cycles state. This is due to the real life drive patterns, as confirmed by a recent Defra report (reference 7). We believe that trucks and buses need to have real life drive cycle tests developed rather than the current "engine only" tests.

11. Diesel trucks, buses and vans account for 25% of the UK's Liquid fuel use (and 50% of diesel usage) yet are less than 10% of the vehicle park. Trucks are only 2% of the vehicle park and buses less.

12. Electric vehicles can potentially provide local air quality improvements but the payload penalty means more journeys are required with additional congestion and therefore knock on emissions in vehicles stuck in traffic. For trucks, there is no possibility to use electric due to batteries. Furthermore, electric vehicles have little chance of making a significant contribution towards meeting European NO<sub>2</sub> air quality standards, which will come into effect in 2015 at the very latest.

13. Vans, Trucks and Buses should be encouraged to use natural gas and ultimately Biomethane as their fuel as this gives virtually zero PM and considerably lower NO<sub>x</sub> (plus lower noise) which is important for cities. Natural Gas is a much more abundant fuel than petrol and diesel. European refineries are diesel constrained—we rely on imports of diesel from the USA and Russia.

14. The Haulage industry will have better and lower fuel price stability with Natural Gas provided the Government puts in place a long term (10 year plus) beneficial fuel duty regime. Dedicated Natural Gas trucks,

**Ev w22 Environmental Audit Committee: Evidence**

buses and vans deliver the benefits wherever they are used and require little change in vehicle usage patterns. Dual Fuel trucks (particularly articulated units) give the range and usage pattern needed for city to city long haul. Dedicated Natural Gas trucks could be made to have payback inside three years if the right duty levels were set.

15. The French Government has allowed vans rated at 3.5te to run at 3.8te if they have natural gas fuel tanks (which weigh more than a diesel tank) so that the operator is not penalised for choosing a cleaner fuel. The UK Government needs to follow suit.

16. Hybrid trucks have a current payback of over 15 years as they are only effective in stop start low mileage city work.

17. To support the development of NGVs in the UK, we believe that the following actions should be considered:

- (a) A clear strategy to encourage the switch over of Commercial vehicles (Vans, Buses and trucks) onto Natural Gas fuelling (and ultimately Biomethane) through a 10 year fixed fuel duty regime.
- (b) Reduction in VED rates for Commercial vehicles running on Natural Gas fuel.
- (c) 100% first year capital allowance for additional cost for Natural Gas fuelled vehicles.
- (d) Addition of 300kg to the limits on Gross Vehicle Weight for Natural Gas fuelled vans at 3.5te to ensure no penalty for choosing a cleaner fuel (CNG is ideal for supermarket home-delivery).
- (e) Full “well to wheels” carbon dioxide and air quality effects need to be introduced to ensure the deliverability for carbon and Air Quality reductions.

**REFERENCES**

1. British Gas NGV Paper from the 1990's [http://87.224.35.44/tech\\_papers/17th\\_congress/2\\_3\\_24.asp](http://87.224.35.44/tech_papers/17th_congress/2_3_24.asp)
2. NGV Statistics—NGVA Europe <http://www.ngvaeurope.eu/statistical-information-on-the-european-and-worldwide-ngv-status>
3. Passat Ecofuel <http://green.autoblog.com/2010/01/06/volkswagen-passat-ecofuel-squeaks-past-prius-as-greenest-car-in/>
4. Transport Emissions from Trucks <http://www.dft.gov.uk/pgr/statistics/datatablespublications/tsgb/latest/tsgb2010energy.pdf>
5. Los Angeles buses—no more diesel <http://www.latimes.com/news/local/la-me-buses-20110112,0,6536088.story?>
6. Madrid refuse trucks on CNG [http://www.sciencedirect.com/science?\\_ob=ArticleURL&\\_udi=B6V1T-4TRR90K-1&\\_user=10&\\_coverDate=05/31/2009&\\_rdoc=1&\\_fmt=high&\\_orig=search&\\_origin=search&\\_sort=d&\\_docanchor=&view=c&\\_searchStrId=1608663932&\\_rerunOrigin=google&\\_acct=C000050221&\\_version=1&\\_urlVersion=0&\\_userid=10&md5=c05d7ea61a74d7992e0faa83bdb6da8c&searchtype=a](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V1T-4TRR90K-1&_user=10&_coverDate=05/31/2009&_rdoc=1&_fmt=high&_orig=search&_origin=search&_sort=d&_docanchor=&view=c&_searchStrId=1608663932&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=c05d7ea61a74d7992e0faa83bdb6da8c&searchtype=a)
7. Defra report on NOx emissions [http://uk-air.defra.gov.uk/reports/cat05/1103041401\\_110303\\_Draft\\_NOx\\_NO2\\_trends\\_report.pdf](http://uk-air.defra.gov.uk/reports/cat05/1103041401_110303_Draft_NOx_NO2_trends_report.pdf)

2 June 2011

---

**Written evidence submitted by the Campaign for Better Transport**

**SUMMARY**

- Our evidence focuses on the effectiveness of the Government's, and the London Government's, transport policy in improving air quality.
- Both nationally and in London a number of transport policy changes have been made since the publication of the Environmental Audit Committee's report on Air Quality in 2010.
- In neither the national nor the London case do these amount to the dramatic change in transport policy that the Environmental Audit Committee concluded is necessary.
- In both the national and London case transport policy changes have been made which are likely to lead to deterioration and not to improvement in air quality.
- Government, nationally and in London, needs to implement measures which will cut air pollution emissions at source by promoting the use of cleaner vehicles and by introducing policies to reduce traffic.

**INTRODUCTION**

1 The Committee will already be familiar with the work of Campaign for Better Transport; we have given written and oral evidence on other matters. Although we were unable to give evidence to the Committee's last investigation on air quality, we noted the report published in March 2010 and welcomed its conclusion that

---

“Transport policy must change dramatically if the UK is to meet future targets and reduce exposure to air pollution”.

2 Campaign for Better Transport is a member of the Healthy Air Campaign, a coalition of NGOs working in the health, transport and environment fields which also includes: Environmental Protection UK, Clean Air in London, Living Streets and others. The coalition has submitted evidence which responds to each of the four themes of the present inquiry.

3 Our evidence is in addition to that already submitted by the Healthy Air Coalition. Our evidence focuses on the third theme for the current investigation: the effectiveness of the Government’s strategy for improving air quality, and how that might be improved. In particular we consider any changes that have occurred in transport policy since the last report, both nationally and in London, where breaches in air quality standards are most frequent and most acute, and assess whether these amount to a dramatic change in transport policy. We indicate in broad terms the effect that any changes are likely to have on air pollution and suggest further changes in transport policy which, in our view, are necessary to ensure that standards are met.

*The effectiveness of the Government’s strategy for improving particulate and NO2 air quality and how that might be improved*

4 In looking again at air quality, it is right that the Committee should maintain its focus on transport policy and on road transport. As the Committee is aware and the evidence from the Healthy Air Campaign points out, road traffic is the largest source of air pollution in most parts of the UK. This is acknowledged in the Government’s Air Quality Strategy.<sup>8</sup>

5 The Committee will also be aware that the wording of the Coalition Agreement, published only two months after its last report on air quality, stopped short of a commitment to meet the deadlines for compliance with the European Air Quality standards: “We will *work towards* full compliance with European Air Quality standards”.<sup>9</sup> (our emphasis)

6 However, some welcome changes have been made to national transport policy which should act to restrain or reduce air pollution emissions:

- Shortly after taking office the Coalition Government announced a decision not to approve additional runways at Heathrow, Gatwick and Stansted.
- The Local Sustainable Transport Fund, to which local authorities can apply, was established with a budget of £560m over four years to cover not just capital spending on infrastructure but also “smarter choices” programmes to influence travel behaviour.
- Changes were made to the system of appraisal for transport projects which moves away from a narrow focus on benefit cost ratios and places more emphasis on looking at different options. This should help redress the bias towards big road schemes.
- Cutting Highways Agency funding for road schemes and for local authority major schemes (often new roads).
- The level of investment in the railways has been maintained, at least over the current spending period to 2015.

7 However the potential for improvement in air quality that might flow from these changes is limited. Firstly, because Transport for London receives dedicated transport funding from Government, London local authorities are not eligible to apply to the Local Sustainable Transport Fund, though breaches in air quality standards occur most frequently in London and the Mayor’s Air Quality Strategy does not present a programme of measures that will effectively address them. Secondly, it is not clear that the Government takes air quality seriously as part of the changes made to the transport project appraisal process. Thirdly, the positive impact of the changes is in danger of being lost against the background of major cuts in public spending. Local authorities have faced losing a quarter of their funding and many have cut back on support for bus services as councils’ legal duties to provide bus services are weaker than their duties in some other service areas, despite local consultations which show that, for many people, this is a priority. Finally spending cuts have also meant that the price of maintaining rail investment has been even higher increases in most fares so that fares will rise by a quarter by 2015.

8 Other transport policy measures introduced by the Government will act as incentives to car use and work against air quality improvement:

- Scrapping the fuel duty escalator.
- Cutting the Bus Service Operators Grant.
- Re-establishing enterprise zones where development will be exempt from the usual planning process, car dependent developments are more likely to be built and greenfield sites are more likely to be used.
- Abolishing national parking standards for residential developments.

---

<sup>8</sup> The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007

<sup>9</sup> The Cabinet Office, The Coalition:our programme for government, May 2010

---

**Ev w24** Environmental Audit Committee: Evidence
 

---

9 The Government response to the Environmental Audit Report on Air Quality in the UK relied on the following examples to support its claim to be looking “at all options for how to further reduce air pollution from transport”:<sup>10</sup>

- The confirmation of grants towards the purchase of low emission cars.
- The expectation of unspecified measures to be adopted by local authorities.
- Changes to the appraisal process for transport projects (as mentioned above).
- Keeping under review emerging evidence on particulates from brake, tyre and road wear.

10 The Government’s endorsement of electric vehicles is unlikely to have much impact until the 2020s, long after the deadlines for compliance with EU air quality standards, for at least four reasons: first, the models are not generally not yet available; second, the existing car fleet will only gradually be replaced; third, the necessary charging infrastructure is not ready across the UK and fourth, despite the Government grant for which take up is slow anyway, electric vehicles may remain more expensive.

11 Campaign for Better Transport believes that these changes and the other changes referred to will not be sufficient to achieve the necessary improvement in air quality and do not amount to a dramatic change in national transport policy. Nor has any such change occurred in London.

12 We have already referred to the fact that breaches of EU air quality standards are more serious and more frequent in London than elsewhere in the UK. It is true that the Mayor has retained much of his predecessor’s plan for improving the public transport network and that this largely survived the Spending Review. He also has an objective, in the Transport Strategy and draft London Plan, of encouraging more walking, cycling and travel by public transport in order to promote a shift from car use to more sustainable modes. But modal shift can co-exist with greater car use when there is a growing population as there is in London. Recent falls in traffic volumes in London (which in any case have not been sufficient to ensure that air quality standards are met) could be reversed in the medium to longer term, indeed the Mayor’s Transport Strategy predicts a 14% increase in congestion by 2031<sup>11</sup> though some in Transport for London, which made the predictions, do not agree

13 Well publicised transport policy decisions in London have also been working against meeting air quality standards. These include:

- Postponement of Phase 3 of the Low Emission Zone from October 2010 to January 2012.
- Abolishing the Western Extension of the Congestion Charging Zone.
- Dropping the 10 year age limit for taxis which had been proposed in the Mayor’s draft Air Quality Strategy and reducing the requirement from every year to every other year for taxis to be checked for engine emissions.

14 A number of policy changes which would work for increased car use and against improved air quality were proposed in the draft replacement London Plan. The final replacement plan has not yet been published following the Examination in Public and the publication of the Panel Report. The proposed policy changes in draft London Plan included:

- Dropping the policy to achieve traffic reduction.
- Abandoning the road user hierarchy which prioritises pedestrians, cyclists and public transport users over the needs of motorists.
- Relaxing parking standards in outer London town centres and for office and retail developments in outer London.
- Relaxing the environmental standards for new roads.

15 Other transport measures likely to have air quality impacts which are being pursued by the Mayor include a programme to smooth traffic flow which will improve air quality by reducing stop-start traffic conditions. But these would also enlarge the capacity of the road network, allow a greater volume of traffic and increase the likelihood of congestion and air pollution if unforeseen incidents occur as they always do. Public realm improvement schemes have been cancelled or compromised because of their anticipated impact on traffic flow (Parliament Square and Elephant and Castle). Recent mayoral planning decisions have approved large traffic generating developments at Brent Cross (a total of 20,000 car parking spaces) and Battersea Power Station, a small part of the Vauxhall/ Nine Elms/ Battersea development zone, (3,250 parking spaces despite also having a new extension to the Northern Line). The so-called “Stratford City” developments (10,000 car parking spaces despite almost unparalleled accessibility by public transport), are about to come on stream.

16 Though often worthwhile in themselves and in order to reduce carbon emissions, other measures which the Mayor has proposed<sup>12</sup> are not convincing as a strategy to contribute transport’s share of the necessary air quality improvements. These include:

- An investment plan to boost cycling.
- 

<sup>10</sup> Government response to the Environmental Audit Committee Report on Air Quality in the UK

<sup>11</sup> Greater London Authority, Mayor’s Transport Strategy, 2010. See for example Figure 69

<sup>12</sup> Mayor’s Air Quality Strategy, Executive Summary, December 2010

- Encouraging the use of electric vehicles, convert London buses to hybrid or low emission and clean up London's taxi fleets.
- Including larger vans and minibuses in the Low Emission Zone from January 2012.
- Introducing a new NO<sub>x</sub> standard for the LEZ from 2015.
- Reducing emissions from freight vehicles by promoting Delivery and Servicing Plans and freight consolidation facilities.
- Working with boroughs to implement targeted action plans at air quality priority locations; and conducting trials of dust suppressants (already underway in central London).
- Tackling vehicle idling.

17 There are obvious difficulties with some of these proposals:

- The target to boost cycling to 5% of journeys by 2020 is unchallenging.
- The proposal to widen the scope of the Low Emission Zone in early 2012 is a postponement of the original date.
- Measures are principally targeted at commercial and public service vehicles not at the bulk of road traffic which is private cars.
- As we have said, electric vehicle are unlikely to have much impact until the 2020s.

18 At a recent Mayor's Question Time, the Mayor listed transport measures which a £5 million grant from the DfT Clean Air Fund would allow him to pursue:<sup>13</sup>

- Increased application of dust suppressants at priority locations.
- Reducing idling at priority locations through the provision of taxi marshals and improved signage and infrastructure.
- Installing Diesel Particulate Filters (DPFs) on buses travelling on certain streets.
- Installing green infrastructure, such as trees, green walls, green screens and green guard rail at priority locations.

19 This list is starting to sound increasingly desperate. What is missing in any of the proposals from the Government or the Mayor is a willingness to reduce demand for car travel, reduce traffic volumes or make the dramatic change of transport policy that the Committee called for in its last report.

20 Evidence from the Healthy Air Coalition to the Environmental Audit Committee shows how the Government's approach to reducing harmful emissions from vehicles has relied on technical solutions whose performance has been inadequate to ensure that air quality standards are met. It concludes that more focus is needed on non-technical measures to reduce traffic as well as to promote travel by more sustainable means.

21 Measures such as dust suppressants, planting trees and targeted action plans at priority locations are intended to mitigate the impacts of air pollution. Much more must be done to tackle the problem at source. Scrapage schemes, incentives to replace older, more polluting vehicles, procurement policies by public transport operators, public service providers and operators of large fleets, retrofitting of abatement equipment all have an important role to play. However, use of a range of possible measures to reduce traffic volumes is also required.

22 Traffic reduction measures may perhaps be placed under four headings. Some measures under each heading are already being pursued though not with sufficient vigour to avoid the health impacts and bring air quality into line with EU standards. Some are capable of being implemented in the short term while others would take longer to bear fruit. The headings are as follows (examples are given under each heading but there are many more):

- Managing the demand for travel ("smarter choices" programmes to influence travel behaviour, road pricing, congestion charging, road closures).
- Improving access to services and amenities (measures to reduce the number and length of journeys by promoting local shops or other services, measures to cut travel to or while at work).
- Designing highways and the public realm (lower speed limits, redesigning roads to improve conditions for walking, cycling and public transport).
- Supporting public transport (improving access to stations, more bus priority lanes, providing more public transport information).

23 The number of premature deaths attributable to poor air quality has not moved either national or London government sufficiently to introduce effective air quality strategies matched by appropriate transport policies. It is hoped that hosting the Olympics in 2012, when the eyes of the world will be on London and breaches of air quality standards would be a national embarrassment, will be enough of a driving force.

2 June 2011

<sup>13</sup> Written response from the Mayor to Question No: 1202 / 2011, May 2011

**Ev w26 Environmental Audit Committee: Evidence**

---

**Written evidence submitted by the Chartered Institute of Environmental Health****SUMMARY**

- The CIEH is the Professional Body for environmental health practitioners (EHPs). Many EHPs in local government perform a range of functions concerned with the monitoring and control of air quality. EHPs are also in private sector positions with an involvement in air quality, for example in respect of workplace health and safety and transport emissions.
- The CIEH, in partnership with AEA Technology, is the largest provider of training to local authorities in the monitoring and control of industrial emissions and local air quality management.
- Much is already known about the impacts of particulate and NO<sub>2</sub> pollution on human and health and on the environment but there is a need for more research. Organisations like the CIEH can assist Government and others in identifying appropriate research subjects.
- Government policies for improving air quality have not been as effective as hoped and more needs to be done in a short timescale.
- The Government's stated policy of a greater degree of "Localism" possibly provides opportunities for more effective action to improve air quality in local areas (focus on appropriate areas and pollutants, expertise available) but also obstacles (lack of relevant data at local level, public spending cuts). The new public health agenda in England specifically has the potential to give added impetus and urgency to local action plans.

**ABOUT THE CIEH**

1. As a Chartered professional body, the CIEH sets standards and accredits courses and qualifications for the education of its professional members and other environmental health practitioners. In partnership with AEAT, the CIEH provides the UK's most extensive training programme for practitioners in environmental monitoring of air quality. Members of the CIEH are involved in the provision of public information about air quality through schemes like AirText. The CIEH also provides evidence and policy advice to local and national government, environmental and public health practitioners and industry. The CIEH is a registered charity with over 10,500 members.

**THE SCALE OF THE AIR POLLUTION CHALLENGE**

2. As the Committee's earlier report<sup>14</sup> explained, there is some research evidence as to the substantial mortality and cost impacts of poor air quality. The Committee called for further research to be carried out, for example into the costs to the NHS, and for more data to be made available relevant to localities. To date, the CIEH is not aware of any improvement on, nor differentiation of, the Defra figures for economic impacts in the range £8 billion to £17 billion.<sup>15</sup> The GLA has produced a report on estimation of mortality impacts of particulate air pollution in London.<sup>16</sup>

3. There remains a need for further research and the Government has not yet responded positively to the Committee's earlier recommendation in taking forward this research. The CIEH and others are currently investigating whether there may be other avenues for commissioning relevant research, for example research into the costs to the NHS of poor air quality. There is a need for evidence also to support the quantification of the benefits—economic, environmental and social—that improving air quality delivers.

4. The members of the CIEH who are engaged in professional work concerning air quality, including those who collect data from monitoring in the course of their duties, are something of an un-tapped national resource. The CIEH would be interested in taking part in deliberations as to how to make best use of the expertise of, and the data generated by, these EHPs.

**POLICY RESPONSES**

5. Clearly, existing public policy is not leading to improvements in air quality on the scale required. The EU Commission continues to threaten the UK with large fines over levels of particulate pollution. The Government's responses of seeking further exemptions and passing the obligation to pay those fines to local authorities do not, in our view, amount in themselves to an effective policy response to the challenges faced.

6. Notwithstanding, the policy development in respect of public health services in England is potentially a step in the right direction. The agenda set for public health improvement in England by the Marmot report<sup>17</sup> provides a platform from which to argue the urgency of the need for action on poor air quality. Raising the profile of public health services (and not least local environmental health services) in tackling such wider determinants of poor health and health inequalities may provide added impetus for more effective action at the local level. Better evidence is nonetheless needed to support effective public health services at the local level,

---

<sup>14</sup> 5th Report 22 March 2010 HC 229-I & II

<sup>15</sup> Updated Third Report of the Interdepartmental Group on Costs and Benefits July 2007

<sup>16</sup> Dr. Brian G Miller June 2010

<sup>17</sup> Fair Society, Healthier Lives. Feb 2010.

however, including area-specific data on the scale of the problem: mortality, morbidity, cost to healthcare services, costs to employers in lost productivity and so on.

3 June 2011

### Written evidence submitted by the British Heart Foundation

1. The British Heart Foundation (BHF) is the UK's leading heart charity. Our vision is of a world where no-one dies prematurely of heart disease. Heart and circulatory disease is the UK's single biggest killer, and despite recent improvements, death rates from cardiovascular disease (CVD) in the UK are relatively high compared to other developed countries.<sup>1</sup>

#### INTRODUCTION

2. We have focussed this brief response of the heart health impacts of particulate matter (PM) air pollution, as this is where the majority of research has been focussed to date. Other air pollutants, such as ozone or nitrogen dioxide, may also pose cardiovascular risk alone or in conjunction with PM exposure, however, further research is needed to find out about the potential effects of these pollutants.<sup>2</sup>

3. Research shows that PM air pollution can make existing heart conditions worse and can trigger cardiovascular events including heart attacks and strokes amongst vulnerable groups.

4. Given the large number of people living in the UK with heart disease and the likelihood of their exposure to air pollution, it is vital that UK governments take action to improve air quality at both national and local levels.

#### PARTICULATE MATTER AIR POLLUTION AND HEART DISEASE

5. The cardiovascular effects of air pollution were first observed after the major smog that occurred in London in 1952. Based on available data from the previous year, it was estimated that there were 4,000 extra deaths during the three weeks after the smog began.<sup>3</sup> Since the 1970s hundreds of epidemiological studies have demonstrated an association between PM and adverse health effects.

6. Particles are grouped according to their size, which ranges from clusters of molecules called ultrafine particles (UFPs), through to fine particles with a diameter of  $2.5\mu\text{m}$  or less ( $\text{PM}_{2.5}$ ), and coarse particles with a diameter between  $2.5\mu\text{m}$  and  $10\mu\text{m}$  ( $\text{PM}_{10}$ ). Most studies show a stronger link between cardiovascular disease and  $\text{PM}_{2.5}$  than other size particles, and there is now sufficient evidence to support a causal link.<sup>4</sup>  $\text{PM}_{2.5}$  contains many of the toxic compounds released on combustion which are thought to cause disease.

7. In 2009 the Committee on the Medical Effects of Air Pollutants reported that the evidence suggests an association between long term exposure to  $\text{PM}_{2.5}$  and effects on mortality, and that this is almost certainly a causal relationship.<sup>5</sup> In a review of the evidence, the American Heart Association concluded that the evidence is consistent with a causal relationship between  $\text{PM}_{2.5}$  exposure and cardiovascular disease and cardiovascular mortality.<sup>2</sup>

8. The health effects of PM air pollution are seen following short-term, as well as long-term exposure. Breathing in PM for a few hours or weeks can trigger cardiovascular events, including heart attacks and strokes, amongst vulnerable groups. Reducing PM levels can help decrease cardiovascular mortality within a timeframe as short as a few years.<sup>2</sup>

9. Increases in cardiovascular morbidity and mortality are mainly amongst susceptible, although not critically ill individuals, such as older people with existing coronary heart disease.<sup>2</sup> Individuals and families with a low income may also be disproportionately affected, as they are more likely to live in accommodation near the busiest, most polluted roads because it tends to be cheaper.<sup>6</sup>

10. It appears that there is no safe threshold for  $\text{PM}_{2.5}$ . Adverse health effects appear to have a linear relationship with exposure, and there is no clear threshold below which pollution levels have found to be consistently safe.

11. The BHF provides a fact sheet on air pollution, included with this response. As aerobic physical activity is very good for the heart, the benefits of exercising outdoors outweigh the risks associated with air pollution for most people. However, people with coronary heart disease should avoid spending long periods outdoors in areas where traffic pollution is likely to be high—near busy roads for example.

12. More research is needed to understand which constituents of polluted air cause heart disease, and the biological mechanisms behind this. The BHF is currently funding several studies in this area, including research investigating the effects of air pollution on the heart and circulatory system, and ways of protecting heart patients from the effects of air pollution.

For further information please contact Katie Chruszcz <mailto:chruszczk@bhf.org.uk>

**Ev w28 Environmental Audit Committee: Evidence**

## REFERENCES

1. British Heart Foundation Health promotion Research Group (2010). *Coronary Heart Disease Statistics 2010*.
2. American Heart Association (2010) *Particulate matter air pollution and cardiovascular disease. An update to the scientific statement from the American Heart Association*. *Circulation* 10 May 2010.
3. Wilkins, E.T. (1954). Air pollution and the London fog of December, 1952. *J.R. Sanit. Instit* 74, 1–21.
4. Brook et al (2008) *Cardiovascular effects of air pollution*. *Clinical Science* 115, 175–187.
5. COMEAP (2009) *Long term exposure to air pollution: effect on mortality*.
6. LACORS (2010) “A Clean Bill of Health”.
7. Schwartz, J, et al (2008) *The effect of dose and timing of dose on the association between airborne particles and survival*. *Eviron Health Perspect.* 116:64.

6 June 2011

---

**Submitted by the Natural Environment Research Council**

## INTRODUCTION

1. The Natural Environment Research Council (NERC) is one of the UK’s seven Research Councils. It funds and carries out impartial scientific research in the sciences of the environment. NERC trains the next generation of independent environmental scientists.

2. Details of NERC’s Research and Collaborative Centres and Major programmes are available at [www.nerc.ac.uk](http://www.nerc.ac.uk).

3. NERC’s comments are based on input from Professor Roy Harrison, Professor of Environmental Health at the University of Birmingham and NERC Theme Leader for Environment, Pollution and Human, the NERC National Centre for Atmospheric Sciences, the NERC Centre for Ecology and Hydrology and NERC Swindon Office staff.

4. NERC provided written evidence<sup>18</sup> to the the Environmental Audit Committee report on Air Quality, published in March 2010. Here we provide information about ongoing NERC support for research relevant to two themes of the inquiry: *The causes of particulate and NO2 air pollution in the UK and how these can be reduced most effectively*; and *the impacts on health and the environment from particulate and NO2 pollution, and how these should be measured*.

## NERC RESEARCH

5. The *Environmental Exposure & Health Initiative*<sup>19</sup> (budget £7M, lifespan 2009–15) is a joint initiative between NERC, the Medical Research Council (MRC), the Department of Health (DH), the Economic & Social Research Council (ESRC), and Department for Environment, Food & Rural Affairs (Defra), launched under the umbrella of the Living with Environmental Change (LWEC) partnership. It will provide important new knowledge on the interconnections and pathways between environmental pollutants and interacting stressors, exposure routes and health effects in humans, including variations in susceptibility and the definition of health risks. This integrated understanding is vital to inform development of evidence-based policies and practices that will reduce the adverse health effects of contaminated water, land, food or air.

6. Several grants<sup>20</sup> associated with this programme were awarded funding in August 2010; those relevant to the inquiry are outlined below:

- Air pollution and weather-related health impacts—methodological study based on spatio-temporally disaggregated multi-pollutant models<sup>21</sup> (budget c. £1.5 million, lifespan 2011–14)—Aims to provide new epidemiological evidence on the health impacts of exposure to multiple pollutants. It will examine the implications of such evidence for the regulation and control of air quality and assess how uncertainties in evidence affect its translation into actionable evidence-based policies and the evaluation of their costs and benefits.
- From Airborne Exposures to Biological Effects: the impact of nanoparticles on health<sup>22</sup> (budget c £1.75 million, lifespan 2011–14)—Nanoparticles are found in vehicle and industrial emissions, yet we know little about their capability to harm, with insufficient information available to allow a risk assessment. This work will address priority objectives recently set by Defra in relation to nanoparticles and human and environmental health, and make a major step-change in the assessment of risks.

---

<sup>18</sup> <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/229/229we10.htm>

<sup>19</sup> <http://www.nerc.ac.uk/research/programmes/eehi/>

<sup>20</sup> [http://gotw.nerc.ac.uk/list\\_them.asp?them=EEHI](http://gotw.nerc.ac.uk/list_them.asp?them=EEHI)

<sup>21</sup> [http://gotw.nerc.ac.uk/list\\_short.asp?searchterm=Air+pollution+and+weather+related+health+impacts+&Submit=Search&sb=t](http://gotw.nerc.ac.uk/list_short.asp?searchterm=Air+pollution+and+weather+related+health+impacts+&Submit=Search&sb=t)

<sup>22</sup> [http://gotw.nerc.ac.uk/list\\_short.asp?searchterm=From+Airborne+Exposures+to+Biological+Effects+&Submit=Search&sb=t](http://gotw.nerc.ac.uk/list_short.asp?searchterm=From+Airborne+Exposures+to+Biological+Effects+&Submit=Search&sb=t)

- Traffic pollution and health in London<sup>23</sup> (budget c £2 million lifespan, 2001–15)—Research will elucidate the more toxic components of the pollution mix in London, with particular emphasis on traffic generated particles to inform a more focussed and efficient policy process for regulating vehicle emissions and ambient air quality. It will provide better information on spatial and temporal exposures to inform more focussed traffic and infrastructure planning and management. A number of investigations to examine the relationship between chronic exposure to traffic pollution and health will be carried out.

7. The Urban Atmospheric Science programme<sup>24</sup> (budget £2.9 million, lifespan 2009–12) was designed as part of the LWEC accredited Environment & Human Health programme, with the input of several LWEC partners, including EPSRC, MRC, and the Environment Agency (along with valuable advice from others, including the Health Protection Agency). NERC has invested the £2.9 million budget of this programme in ClearLo,<sup>25</sup> to be carried by a consortium of universities and NERC research centres, led by University of Reading. ClearLo will provide integrated measurements of the meteorology, composition and particulate loading of London's atmosphere to improve the prediction of air quality—a key priority for improving quality of life and increasing life expectancy in cities. The new measurement capabilities established by ClearLo will be used for long-term measurements and intensive observation periods. Analysis and modelling of the measurements will establish key processes responsible for producing the main pollutants in urban areas which affect health.

8. The *Networks of Sensors—Demonstration High Resolution Networks*<sup>26</sup> programme is a five-year NERC research programme (2010–14) that is supporting six collaborative demonstration projects exploiting the potential of distributed high density networks of sensors, with the objective of discovering new insights into the environment. As part of this programme NERC has invested around £1 million in a *High density sensor network system for air quality studies at Heathrow airport*<sup>27</sup>. The overall scientific objective is to demonstrate the potential of low cost sensor network systems for characterising air quality in the urban environment, to understand the factors which influence pollutant distributions on local scales. The project will develop and demonstrate a sensor network system in and around London Heathrow Airport for an extended period.

9. The NERC National Centre for Atmospheric Science (NCAS) conducts a long-term programme of research in to air quality. The ambition of this programme is to improve the prediction of human exposure to air pollution and the attribution of contributing sources. This forms one of four central NCAS science challenges (along with short and long term climate science and high impact weather). NERC makes an investment of around £1.5 million per annum in this on-going research through NCAS (distinct from other investments outlined in this memorandum). NCAS also provides underpinning support for many of the fixed-term research grants highlighted elsewhere in the response. The Air Quality research theme is led by one of the NCAS science directors, Prof. Ally Lewis, and draws on research staff based a number of key Universities. The activity is conducted in close consultation with Defra (Atmosphere and Local Environment) and is undergoing the process of LWEC accreditation. Of specific relevance to this Inquiry are the following NCAS research activities:

- assessment of how atmospheric composition varies over space scales from the street canyon to continents and develop understanding of how processes operating on these various scales interact;
- quantification of the changing background in atmospheric composition and the effects of this in controlling future air quality ;
- prediction of the frequency and severity of poor air quality events ;
- reduction in uncertainty in the chemical and physical mechanisms associated with aerosol and particle formation and transformation;
- improving estimates of key biogenic and anthropogenic atmospheric emissions that influence both background and localized air quality and in particular O<sub>3</sub> and NO<sub>2</sub>; and
- assessment of the adequacy of existing UK observation networks and air quality prediction models.

10. The NERC Centre for Ecology and Hydrology coordinates a large-scale collaborative project co-funded by the EC 7th Framework programme *Effects of climate change on air pollution impacts and response strategies for European ecosystems* (ECLAIRE, 2011–14), which will investigate the effect of air quality and climate change on ecosystems, including carbon sequestration and ecosystem services. This project brings together 39 international research institutions and will answer vital questions on the effect of future strategies to combat air pollution and climate change on European ecosystems.

11. Defra commissioned CEH to coordinate a group of scientific experts to produce a Review of Transboundary Air Pollution (RoTAP).<sup>28</sup> The RoTAP report aims to review the current state of rural air pollution issues in the UK, evaluate the extensive measurements of atmospheric pollutants and their effects,

<sup>23</sup> [http://gotw.nerc.ac.uk/list\\_short.asp?searchterm=Traffic+pollution+and+health+in+London+&Submit=Search&sb=](http://gotw.nerc.ac.uk/list_short.asp?searchterm=Traffic+pollution+and+health+in+London+&Submit=Search&sb=)

<sup>24</sup> <http://www.nerc.ac.uk/research/programmes/uas/>

<sup>25</sup> [http://gotw.nerc.ac.uk/list\\_short.asp?searchterm=clearflo&Submit=Search](http://gotw.nerc.ac.uk/list_short.asp?searchterm=clearflo&Submit=Search)

<sup>26</sup> <http://www.nerc.ac.uk/research/programmes/nos/>

<sup>27</sup> [http://gotw.nerc.ac.uk/list\\_short.asp?searchterm=High+density+sensor+network+system+for+air+quality+studies+at+Heathrow+airport+&Submit=Search](http://gotw.nerc.ac.uk/list_short.asp?searchterm=High+density+sensor+network+system+for+air+quality+studies+at+Heathrow+airport+&Submit=Search)

<sup>28</sup> <http://www.rotap.ceh.ac.uk/>

**Ev w30 Environmental Audit Committee: Evidence**

and produce a synthesis of current understanding which will be used to determine air quality policies. The review focuses on the main chemicals causing acid deposition, eutrophication, ground level ozone and heavy metal pollution in the UK, namely sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>), aerosols (particulate matter), heavy metals, nitric acid (HNO<sub>3</sub>) and ozone (O<sub>3</sub>). The RoTAP report reviews all of the current data available to the group on these pollutants and their contribution to acidification, eutrophication, ground level ozone and heavy metal deposition in the UK. A draft copy of the RoTAP report is available.<sup>29</sup>

12. NERC is currently supporting numerous other grants relevant to air quality, constituting an investment of over £5 million. Several examples are provided below:

- *Demonstrating Techniques for Air Pollution Source Performance Assessment*<sup>30</sup> (budget c £225K, lifespan 2009–12)—This research aims to demonstrate the advantages of “smarter” forms of aerometric analysis to a wide range of air-quality practitioners. It will show how existing and novel techniques can be used to exploit air-quality data more fully and rigorously, and crucially how the extra information can benefit operational and policy decisions.
- *Improving representation of wildfire smoke transport and effects in a key operational atmospheric monitoring and forecasting scheme*<sup>31</sup> (budget c £100K, lifespan 2011–12)—UK air quality can be significantly affected by long-range transport of smoke from European and Russian wildfires particularly when particulates and trace gases are injected high into the atmosphere. This work will exploit the findings from two previous successful NERC research grants to provide major improvements to the current prescription of wildfire smoke plume injection height in the prototype Global Monitoring for Environment and Security UK/European atmospheric monitoring and forecasting scheme.
- *Aerosol model Robustness and Sensitivity study for improved climate and air quality prediction (AEROS)*<sup>32</sup> (budget c £337K, lifespan 2010–13)—AEROS is a collaboration of the University of Leeds, Oxford University, the UK Met Office and the European Monitoring and Evaluation Programme to comprehensively assess the performance, quantify the uncertainties and develop strategies for improvements of the latest generation of global aerosol models. The overall outcome of this proposal will be improvement in predictions of aerosol properties, variability and spatial distribution that are fundamental requirements for accurate prediction of aerosol climate and air quality effects.

6 June 2011

---

**Written evidence submitted by Councillor Paul Braithwaite, London Borough of Camden**

For the last nine months Camden’s Health Scrutiny Committee has had a cross-party working group of Councillors investigating the effects on residents’ health of air quality (AQ). On 1 June the group’s draft report and recommendations were presented to the Committee and accepted nem con. After responses from the NHS and Camden officers it will go forward to Camden’s Cabinet. This submission contains key extracts from that report.

(Item 9 of Camden Council agenda and attached PDF) <http://democracy.camden.gov.uk/mgConvert2PDF.aspx?ID=3684&T=10>

**SUMMARY OF EAC SUBMISSION**

1. The health scrutiny working group started from being concerned about the effects of pollution on the health of those who live and work in Camden. We recognise that, going forward, we will need to work cooperatively with neighbouring boroughs and will be dependent on resources and help both from TfL and Defra. We aspire for Camden to be a leading exemplar borough.

2. The biggest issue that needs to be addressed is the public’s understanding—through raising awareness of the health ramifications of not only mortality (up to 10 years off the life of those most at risk) but also morbidity, the day-to-day wellbeing of our residents. The coincidence of poor air quality with hot sunny days is counter-intuitive and simply not understood. It is alarming that in March, April and May this year, there have been forty days out of ninety with airTEXT health warnings of poor air quality in Camden. At present carbon reduction is centre stage but the consequences of air pollution needs to be elevated to similar prominence, because of its cost to the nation’s health and the NHS, which is not collecting the data.

3. In the last three years there have been retrograde and woefully inadequate measures towards bringing London into compliance with EC directives. Without a major initiative, London is in danger of failing to meet required air quality standards during the Olympics—to the nation’s disgrace and the prospective loss of £175 million of the broadcasting fees. Even at this 11th hour, serious consideration should be given to making the

<sup>29</sup> <http://www.rotap.ceh.ac.uk/documents>

<sup>30</sup> [http://gotw.nerc.ac.uk/list\\_full.asp?pcode=NE%2FG001138%2F1&classtype=](http://gotw.nerc.ac.uk/list_full.asp?pcode=NE%2FG001138%2F1&classtype=)

<sup>31</sup> [http://gotw.nerc.ac.uk/list\\_full.asp?pcode=NE%2FI022116%2F1&classtype=](http://gotw.nerc.ac.uk/list_full.asp?pcode=NE%2FI022116%2F1&classtype=)

<sup>32</sup> [http://gotw.nerc.ac.uk/list\\_full.asp?pcode=NE%2FG006172%2F1&classtype=](http://gotw.nerc.ac.uk/list_full.asp?pcode=NE%2FG006172%2F1&classtype=)

existing inner-London congestion zone, enforced by the camera network, an LEZ in time for the Olympics with the banning of all diesel vehicles that fail to meet the Euro 4 standard.

4. The single biggest short-term gain could be achieved by addressing London's 23,000 black cabs, which the Mayor recognised are responsible for more than 30% of central London's PM<sub>10</sub> particulates. Additionally, London's particulate filters on its 8,000 buses raise levels of NO<sub>x</sub>, hence NO<sub>2</sub>. This could be overcome by an urgent programme of retrofitting them with SCR electrolytic filters.

5. Camden is a pioneer of bio-methane fuelled vehicles, with 17 of our own fleet, plus trials with John Lewis and Waitrose delivery vehicles, based out of our Kings Cross transport depot. This fuel has the benefits of being clean, reliable and inexpensive. It is a bi-product of organic waste and anaerobic digestion and, unlike bio-diesel, it does not use up valuable agricultural land.

6. The working group proposes to hold an Air Quality summit this September bringing together all involved parties, stakeholders and interested local citizens. Also, given adequate funding, the group recommends production of a series of educational videos on air quality issues for use in primary schools. We recommend focussing on awareness-raising with groups most at risk, such as those with COPD, cyclists, taxi drivers etc.

7. The group is extremely concerned that the current hiatus in the NHS, coincidental with the move of responsibility for Public Health into Local Authorities, will lead to funding evaporating, staff quitting and activity initiatives—for example walking and outdoor gyms—becoming neglected “Cinderella” services.

#### VERBATIM EXTRACTS FROM THE REPORT BY CAMDEN'S HEALTH SCRUTINY SUB-COMMITTEE

*From the chairman's foreward:*

8. London's Air Quality (AQ) is consistently in breach of EC laws for air quality standards, which are there to protect the health of our residents and working population.

9. In Camden we have several hot-spots of pollution and they relate to traffic volumes: Tottenham Court Road, Finchley Road, Theobald's Road, Camden Road, Kentish Town Road, Kilburn High Road for example. The worst example in Camden is the Euston Road.

10. The pollution every day around Kings Cross and St Pancras stations is caused by emissions from the thousands of taxis with diesel engines that queue and drop off and it is exacerbated by the diesel trains that still arrive at both stations. The taxi problem is common to all London station termini and ideally needs addressing with a London-wide approach.

11. Very little has been achieved in the last three years by Defra, or by the GLA. Their focus has been on modelling and seeking delays and waivers, rather than concentrating on bold action to redress our poor AQ. Spraying the worst roads with suppressant glue, the current TfL experiment on the Euston Road, is expensive and is not a practical long-term solution.

12. We need to discourage journeys and encourage cleaner engine vehicles. Whilst Camden cannot single-handedly transform central London's AQ, we can encourage and participate in co-operation between neighbouring inner-London boroughs and the GLA by sharing our expertise, for example in our pioneering of bio-methane clean fuel.

13. Mayor Ken Livingstone made big strides by introducing a Low Emissions Zone (LEZ) for heavy goods vehicles inside the M25 in 2008, introduced an inner London congestion zone and added particulate filters to all of London's buses. Since 2008 Mayor Boris Johnson has made more modest strides and indeed he has worsened the problem in a number of ways:

- Delaying the start date for introducing cleaner engine requirement for “white vans” and taxis from Oct 2010 until January 2012.
- Abolished the western extension congestion zone (WEZ) in December 2010.
- He is removing all bendy buses from London's road before 2012, with consequential increase in the number of buses to replace them.
- He has reprieved taxis age for acceptable re-registration to 15 years (instead of the 10 years originally proposed), from January 2012.

14. Unfavourable weather conditions and emissions carried from Europe has led to much elevated air pollution levels in London almost daily since mid-March this year. This also resulted in a formal Smog incident over the Easter weekend.

15. ALL diesel vehicles emit particulate matter. Diesel cars are however encouraged by the fiscal policies set by the Department for Transport (DfT). The Vehicle Excise Duty (VED) rewards low CO<sub>2</sub> emitting vehicles whilst totally ignoring the pollution and health consequences of diesel engines. Even modern diesel cars still emit harmful particles. The working group therefore encourages Camden to follow the lead of the borough of Kensington and Chelsea and surcharge resident parking permits by at least £15 pa for all diesel engine cars.

16. Currently, several monitoring sites in London, including the Euston Road in Camden, are in breach of European limit values for PM<sub>10</sub>. Member states are allowed up to 35 days of elevated PM<sub>10</sub> levels per year. In

**Ev w32 Environmental Audit Committee: Evidence**

2011, in the 106 days to Easter, London had already exceeded this annual quota. This is clinical evidence to the European Commission that London is not, despite warm words, anywhere near compliance despite the waivers granted and aspirational assurances.

17. It is the immediate prerogative of the Commission to instigate proceedings in the European Court of Justice to impose a penalty of up to £300m for London's PM<sub>10</sub> particulate breaches. Such proceedings would be lengthy.

18. Perhaps more immediately attention-getting is the prospect of the Olympic Development Authority (ODA) withholding 25% of the broadcast revenue from the Olympics, £175 million, if London's AQ is in exceedence during the Olympics. This looks to be highly likely, given the proposed dedicated road lane network for Olympic traffic, which is bound to exacerbate traffic congestion in London.

19. Despite assurances to the contrary, to avoid that costly penalty, it may be necessary to introduce a daily alternate odds and evens number plate ban during the Olympics, as happened in the Beijing.

20. While this report cannot bring about any immediate solutions, we hope it will provide focus and begin to increase public understanding of this worrying silent killer that affects our residents in Camden. There follow a number of practical recommendations commended to Camden's Councillors and officers. We encourage Camden's Cabinet to make improving AQ a priority alongside its serious commitment to carbon reduction.

**21. RECOMMENDATIONS (IN FULL):***Developing public understanding*

- 21.1 The working group recommend that Camden Council hosts an Air Quality Summit in September to invite participation by residents and third sector organisations to hear from Kings College, Defra, TfL, CAL and the NHS about Air Quality health impacts, per Camden's recent Green Summits.
- 21.2 We recommend that Camden's Sustainability team looks at implementing targeted air quality campaigns at both polluters and those most vulnerable (for example cyclists AND taxi drivers) to the effects of air pollution and produce a strategy and prospective budgets. We suggest seeking funding from the RAC Foundation, European Commission, TfL, Wellcome Trust, Defra etc. to create a series of modular videos for primary schools.
- 21.3 We recommend a link with Camden North Reach team to utilise the successful Kings College smartphone App and the soon-to-be-revised AirTEXT system with COPD rehabilitation service patients, incorporating these alert systems into the wider COPD service.
- 21.4 We recommend that the Council pilot air quality awareness days through the Council and local NHS websites and staff intranets. Further, the Council should encourage local communities to propose local car-free days and cycle to school experiments.

*Transport*

- 21.5 We recommend that the Council work in partnership with neighbouring boroughs, the GLA and TfL to create a Berlin-type central London LEZ inside the congestion zone, banning all diesel engine vehicles that do not meet Euro 4 standards, to be introduced as an emergency measure for the Olympics—with a view to extending subsequently. The working group recognises the complexity of this task but notes the likelihood of £175 million withholding of broadcast rights revenue unless such a measure is instigated.
- 21.6 We suggest a London-wide approach to Taxi pollution. We recommend TfL introduce a telephone hotline for Londoners to report both buses and taxis that are emitting soot, as traps are obviously proving ineffective. We encourage working with the PCO and Defra towards fast-track introduction of clean fuel taxis through a scrappage scheme and an urgent focus on an immediate pan-London approach to station termini queuing and loading. Camden should seek to greatly increase the number of simultaneous loading positions at Kings Cross and St Pancras and encourage the use of Marshals.
- 21.7 Camden should seek to share its expertise (for example pioneering bio-methane clean fuel) and encourage co-operation between neighbouring boroughs (for example, reciprocal use of charging points) and with the GLA to work on projects to improve AQ, increase transparency and public understanding.
- 21.8 We recommend that the Sustainability team considers and reports on how the Council plans to take action against idling vehicles.

*Camden's Air Quality Action Plan, communication and partnership working*

- 21.9 The working group recognise that Camden has a comprehensive Air Quality Action Plan. However, we recommend that AQ is elevated up the sustainability agenda within Camden Council, especially in terms of raising public understanding. It should be equal in status to climate change and be integrated into the Council's strategies and those with local partners. For example, our current Climate Change Alliance should be encouraged to follow the City of London's new ground-breaking "City Air" initiative to businesses and add to its current CO<sub>2</sub> focus raising the profile of AQ to businesses
- 21.10 We recommend that the Council and NHS include data on AQ in the Joint Strategic Needs Assessment

and use this as the springboard for negotiating local strategies and as a platform for raising understanding and awareness of AQ issues.

21.11 We recommend that Camden's Sustainability team establishes links with the NHS for joint working by implementing a Council/NHS Communications plan on AQ. The current process of absorption of Public Health within the local authority is noted to be a period of considerable risk but it also presents an opportunity to strengthen and integrate. The Sustainability team should appoint an officer to lead on this project and act as a conduit for the key players, potentially with clinicians at RFH and UCLH.

21.12 We recommend that the Council and NHS seek financial funding and support from DEFRA and the GLA, to commission a study looking at perceptions of AQ effects in Camden, comparing Somers Town ward with a ward in the north of the borough.

COUNCILLORS PAUL BRAITHWAITE, SAMATA KHATOON AND MAYA DE SOUZA

### *Transport*

#### *Taxis*

22. The working group has grave concerns about the number of dirty-engined old taxis in London. Just 23,000 back cabs are responsible for more than 30% of PM<sub>10</sub> emissions in Central London, in part due to queuing at and rat-running to railway stations. The GLA is introducing marshals at Kings Cross, St Pancras and Euston but there are doubts whether this can succeed in persuading taxis not to keep their engines idling. The working group wishes to further explore a by-law to preclude taxis from picking up from Camden stations unless they have a Euro 4 engine. But this is a London-wide issue and would best be addressed by the Central London Transport Partnership. We recommend a new TfL 24-hour dedicated hotline to report both taxis and buses emitting soot, using photo proof from smart phones.

#### *Buses*

23. With regard to improving emissions from London's bus fleet, Camden has encouraged TfL to consider the use of biomethane gas. This would significantly reduce air pollutant emissions when compared to the diesel fleet—PM<sub>10</sub> by 90% and NO<sub>x</sub> by 60%, and with added benefits in terms of the fuel savings which would also be achieved. The working group encourages TfL to retrofit all London's 8,000 fleet with SCR electrolytic NO<sub>x</sub> filters—because the particulate traps currently used have had the unfortunate side-effect of boosting NO<sub>x</sub>, hence NO<sub>2</sub>. With the recent news that the Transport Secretary is providing the Mayor of London's office with £5 million to improve air quality in London, it is hoped that this fund could be used in such a way.

#### *Motorcycles*

24. The side effect of the congestion zone being free to motorbikes has been detrimental. This is because it has hugely boosted sales of scooters and motorbikes for commuters. Contrary to the public's perception, motorbikes, particularly those with two stroke engines (which burn oil as well as petrol) are far from clean. These new motorcycle commuters are contributing to central London's pollution whilst riders enjoy a free ride, whilst doing nothing for the rider's health. The Mayor's experiment of allowing motorbikes alongside bicycles in bus lanes has been poorly received by cyclists and has apparently not reduced motorbike accident rates.

#### *Cycling*

25. The working group has concerns about the effect that air pollution has on all people who take strenuous physical exercise outdoors on or close to main roads in the borough. Cycling has increased enormously in London in recent years and Camden has led the way. The Barclay bike hire scheme has given cycling a big boost and has introduced thousands of newcomers to the benefits of cycling, many of whom have become new cycling commuters. This has been encouraged by the Mayor of London's introduction of new "Cycling Superhighways". However, these radial routes have been superimposed on and around already overloaded main arterial roads, such as the A23 through Clapham.... There is a need to educate cyclists (and pedestrians) to use parallel side roads wherever possible and understand how bad our clogged roads are for health.

#### *Bio-methane fuel*

26. Biomethane gas is a clean and renewable transport fuel. It has attractive financial benefits, being priced at approximately 20% below diesel. Lorries and large vans which run on biomethane comply with the particulate matter emission standards set by the London Low Emission Zone, hence saving a £200 daily charge. Biomethane gas vehicles operating before 2012 are exempt from the Mayor's congestion charge scheme. Gasrec is the Europe's leading commercial producer of liquid biomethane fuel. The fuel is being produced from landfill gas released during the decomposition of organic waste. The landfill gas is then upgraded to liquid bio-methane which can be used in vehicles run on compressed or liquid natural gas.

**Ev w34 Environmental Audit Committee: Evidence**

---

*Low Emission Zones*

27. The working group is interested in Low Emission Zones (LEZs) and whether we could implement an LEZ in Camden in partnership with other boroughs through the Central London Air Quality Cluster Group. An LEZ aims to reduce the pollution of diesel-powered vehicles in London by surcharging vehicles that fail specific emission standards (eg Euro 4). Like the congestion charge, an LEZ could be monitored using automatic number plate recognition cameras. It is proposed that different vehicles would be affected over time and tougher emission standards could be implemented progressively.

*Developing Public Understanding*

28. Thus far the view has prevailed that authorities should not risk causing public concern. The working group takes the alternative view that it is time to be more candid, so that AQ does not stay below the radar.

29. Camden residents can access the airTEXT service which provides AQ alerts via a free text message, voicemail or email about the prospect of air pollution the next day—but only 92 Camden users are registered. Additionally the trigger thresholds that are used were set in 1998 and do not match those recognised by the World Health Authority (WHO). The working group recognise that this is a London-wide scheme but there is an urgent need to upgrade this service and publicise it. COMEAP is in the process of bringing in new contemporary thresholds.

30. The working group was very impressed with the King's College iPhone App and although it is recognised that this service is not universally accessible it was interesting to hear that their most subscribed site for users of the App is in Bloomsbury.

31. Camden has in hand a new exemplar innovation:

a real-time visual display to be erected soon on the Euston Road, beside the Town Hall (south side). Given that the Euston Road is one of London's worst hot spots, the working group recommend that this sign (funded by Defra) be bold in conveying the local poor air quality to raise awareness of risks to health of pedestrians, cyclists and drivers alike. A nearby billboard states that 1,600,000 people pass by every two weeks, so it will certainly be seen by vast numbers of drivers, bus passengers and pedestrians.

3 June 2011

---

**Written evidence submitted by the Royal College of Physicians****INTRODUCTION**

1. The Royal College of Physicians (RCP) welcomes the House of Commons Environmental Audit Committee's inquiry into Air Quality in the UK. We value the opportunity to provide evidence.

**COMMENTS**

2. Our experts believe that the follow-up report might usefully consider nanomaterials (in particular, fuel additives) which are increasingly used to improve the efficiency of fuel consumption in engines. As stands, routine procedures are not available for monitoring nanoparticles in the environment, meaning it cannot be determined:

- who is exposed and to what.
- where nanoparticles accumulate.
- how long nanoparticles persist and with what biological effects.

3. Do we know we know enough about how air pollutants (including nanoparticles) interact, and with what effect?

4. How does air quality influence the behaviour of people with regard to spending time outdoors? At a time when the population is encouraged to spend time exercising or simply being outdoors, this would appear important (especially given the fact that 85% live in urban environments where air pollution is most severe).

5. How do the policies of the Department of Health, Department of Transport, DEFRA and DECC interact to minimise air pollution and its damaging effects? We believe that joined up thinking among the above—and also with the Ministry of Defence—is required to encourage active transport and to disinsensitise “fossil fuel travel”. Such integrated policy would have advantages to air pollution, obesity, diabetes, asthma, stroke, MI, cancer rates, climate change, and UK energy security.

3 June 2011

---

---

### Written evidence submitted by UKLPG

UKLPG welcomes the opportunity to respond to the Inquiry by the Environmental Audit Committee on Air Quality. UKLPG is the trade body for the Liquefied Petroleum Gas (LPG) industry and represents all the major LPG supply companies, LPG conversion equipment suppliers and vehicle converters in the UK. This response outlines the LPG industry's views generally on the current Air Quality approach in the UK, specifically relating to the role of transport policy. We would be happy to discuss any of the issues raised in this response and in the consultation paper with the Environmental Audit Committee.

#### 1. EXECUTIVE SUMMARY

1.1. LPG autogas is a popular, clean and green fuel with the potential to help to meet the UK's public policy objectives on clean air as well as CO<sub>2</sub> emissions.

1.2. UKLPG fully supports London's and the UK's objectives of meeting the Air Quality Directive's PM limit values by 2011 and NO<sub>x</sub> limit values by 2015.

1.3. Measures to support innovation, research and development as well as the take up of new products are welcome, UKLPG would however emphasise the role that existing technology could play. LPG autogas is an established and proven technology which can be applied to private cars, taxis, and light commercial vehicles, without the need to scrap and replace a large number of vehicles.

1.4. Air Quality Strategy tends to focus on only two transport fuels: electric and hydrogen. If other alternatives to conventional fuels are not considered, opportunities to reduce emissions of pollutants speedily and economically could be wasted. UKLPG believes that any strategy should include a thorough consideration of the role of transport fuels in meeting emissions targets, and of support for alternative fuels with lower NO<sub>x</sub> and PM emissions, such as LPG autogas.

#### 2. ABOUT UKLPG

2.1. UKLPG is the trade body for the Liquefied Petroleum Gas (LPG) industry and represents all the major LPG supply companies, LPG conversion equipment suppliers and vehicle converters in the UK.

2.2. This document has been produced by the LPG autogas division of UKLPG, and focuses on LPG as a transport fuel for passenger and light commercial vehicles.

2.3. Member companies cover over 95% of the total LPG sales in the UK, around 80% of autogas equipment sales and the participants in the UKLPG Approved Autogas Installer Scheme account for around 70% of vehicle conversions.

2.4. LPG autogas, also known as propane, is a clean and readily available, low carbon alternative fuel. There are over 160,000 LPG vehicles in the UK, served by over 1,400 refuelling sites and a national network of vehicle installers, representing a £50 million investment from the LPG industry.

2.5. There has been significant international take up of LPG autogas, most notably where support was available from governments. In Germany, for example, the government announced in 2006 that fuel duty on LPG would be fixed to 2018. The market is now growing to over 100,000 conversions per annum. Vehicle manufacturers are now producing factory fitted LPG options for the market.

#### 3. LPG AUTOGAS AS A CLEAN FUEL

3.1. LPG is a by-product of oil refining and/or natural gas importation, supplied to market as a liquid gas under pressure. It is supplied to petrol stations by road tanker and is stored in a tank and delivered to cars in a similar way to petrol through a dedicated pump. Cars are either converted to LPG at point of manufacture, or retrofitted, at a cost between approximately £1,300 and £2,500.

3.2. LPG is a clean fuel, exceeding the highest performing combinations of conventional fuels and new vehicles in terms of air quality. Proposed Euro VI limits for diesel commercial vehicles are 0.08 gm/km NO<sub>x</sub> and 0.005 gm/km PM, a moderate improvement on current Euro V standards of 0.18 gm/km NO<sub>x</sub>, and 0.005 gm/km PM. Average emissions for LPG, according to 2003 EDC Type 1 European Emissions Testing Programme tests, were 0.018 gm/km NO<sub>x</sub>, with PM levels too low to measure.

3.3. Increased uptake of LPG autogas in the UK could make significant contributions to meeting the UK's targets.

3.4. LPG autogas has additional benefits in terms of noise pollution and CO<sub>2</sub> emissions. Vehicles running on LPG are estimated to reduce noise pollution by 50% when compared with diesel.

Life cycle (well to wheel) analysis demonstrates that an LPG autogas-fuelled vehicle generates 14% and 10% lower CO<sub>2</sub> emissions than its petrol and diesel run equivalents respectively. Exact emissions vary between vehicles, but the vast majority of cars in the existing parc (total vehicles on London's roads) would have their exhaust CO<sub>2</sub> emissions improved.

**Ev w36 Environmental Audit Committee: Evidence**

3.5. LPG autogas is a retrofitted solution, meaning that there are immediate opportunities for Londoners to reduce their emissions by converting to LPG. Other solutions, such as electric vehicles, are only adopted where members of the public purchase a new car.

3.6. LPG autogas is an innovative, low cost and low carbon technology with a fully established national conversion and refuelling network—a network created by the private sector, with no cost to Government. The infrastructure is in place to provide LPG capability and consequent emissions reductions to the 20 million-plus petrol vehicles currently on our roads and the 60% of new cars which are fuelled by petrol.

3.7. There is a mature network of LPG autogas filling stations in the UK, including several within the major cities such as London and Birmingham. These filling stations are operated by both well-known brands such as Shell, Total, BP, Sainsburys, Morrisons and Co-Op, as well as many independent suppliers of LPG.

3.8. There are numerous examples from around the world, such as Asia, where LPG works well with electric vehicles, providing back up power for when batteries run out. Hybrid solutions like these demonstrate that LPG is an established and proven solution that could help to provide a stepping stone in the roll out of electric cars as part of the energy mix.

**4. CONCLUSION**

4.1. LPG autogas can play a key role in meeting the EU targets. As a proven and established technology that can be applied to existing vehicles, LPG autogas can deliver reductions in NO<sub>x</sub> and PM levels quickly and cheaply.

UKLPG would be delighted to discuss the content of this document in further detail. For further information, please contact:

**APPENDIX****CASE STUDY: LPG LIGHT COMMERCIAL VEHICLES VERSUS EURO 5 STANDARDS**

Converted Euro IV light commercial vehicles converted to LPG autogas are cleaner than Euro V standards. Euro V converted vehicles are not yet available to test, but with Euro IV converted already bettering the Euro V standard then even greater benefits can be expected in the future.

The comparisons below show two typical LPG LCV results for type N1 and type N2. Both examples demonstrate the continuing advantage of LPG in comparison with petrol and diesel light commercial vehicles: better on NO<sub>x</sub> than petrol and diesel; infinitely better than diesel on particulates, and considerably better than petrol on complex hydrocarbons.

<i>Emission<sup>(3)</sup></i>	<i>Diesel LCV Type N1<sup>(1)</sup></i>		<i>Emission<sup>(3)</sup></i>	<i>Diesel LCV Type N2<sup>(2)</sup></i>	
	<i>Euro V</i>	<i>LPG Average<sup>(4)</sup></i>		<i>Euro V</i>	<i>LPG Average<sup>(4)</sup></i>
NO <sub>x</sub>	0.180	0.010	NO <sub>x</sub>	0.180	0.010
PMs	0.005	Below measurable levels	PMs	0.005	Below measurable levels

1 Based on a 1.6 Citroen Berlingo.

2 Based on a 2.3 Ford Transit.

3 Euro standards limits as per European Emission Regulations—source [www.dieselnet.com/standards/eu/ld.php](http://www.dieselnet.com/standards/eu/ld.php)

4 Figures taken from emissions testing carried out for Powershift Registration 2010.

<i>Emission<sup>(3)</sup></i>	<i>Petrol LCV Type N1<sup>(1)</sup></i>		<i>Emission<sup>(3)</sup></i>	<i>Petrol LCV Type N2<sup>(2)</sup></i>	
	<i>Euro V</i>	<i>LPG Average<sup>(4)</sup></i>		<i>Euro V</i>	<i>LPG Average<sup>(4)</sup></i>
NO <sub>x</sub>	0.060	0.010	NO <sub>x</sub>	0.180	0.010
THC	0.100	0.054	THC	0.160	0.071

1 Based on a 1.6 Citroen Berlingo

2 Based on a 2.3 Ford Transit

3 Euro standards limits as per European Emission Regulations—source [www.dieselnet.com/standards/eu/ld.php](http://www.dieselnet.com/standards/eu/ld.php)

4 Figures taken from emissions testing carried out for Powershift Registration 2010

---

### Written evidence submitted by Countrystyle Recycling Ltd

Countrystyle Recycling Ltd welcomes the opportunity to comment on this inquiry.

We intend to build a number of Anaerobic Digestion plants and the gas thus generated will be injected into the grid. Each plant will inject in excess of 25,000,000 kWh of biomethane per annum. In at least one case we are in discussions with a London Borough who want to provide a gas filling station to enable their waste collection vehicles to run on compressed natural gas (CNG) and it is likely a number of other authorities will wish to progress CNG filling stations.

CNG for heavy goods vehicles compared to diesel substantially reduces the levels of NOx and PM10s which as the Committee know are a significant contributor to poor air quality in London.

We agree with the comments made by CNG services and enclose a copy of their supporting statement.

- Natural gas as a vehicle fuel provides significant benefits in terms of local air quality and is the fuel of choice in cities with air quality problems such as Los Angeles, Rome, Delhi.
- The embodied energy principles of using gas especially when generated from waste and then for vehicle fuel has significant benefits in terms of improving air quality compared to diesel fuel.

We believe that now is an appropriate time for the Government to review the benefits of natural gas in relation to air quality and also the reduction in CO<sub>2</sub>, jobs, investment and reduced oil imports.

Much of the world is introducing natural gas vehicles; we believe the UK commercial vehicle and bus sectors should also follow this path and request that this option is reviewed by the Environmental Audit Committee.

3 June 2011

---

### Written evidence submitted by Air Quality Management Resource Centre, University of the West of England, Bristol

This letter constitutes a response to the Environmental Audit Committee's latest call for evidence on air quality. The points made in our submission to the last call for evidence in December 2009 still stand and this submission should be seen as additional to those. The key points made in our response can be summarised as follows:

- There is an important relationship that needs to be maintained between action to improve air quality at a national level and at a local level. For a number of reasons this relationship has not been sufficient so far to achieve the UK air quality objectives and limit values, however we feel that that there is a real danger that the government's current intentions with respect to the agendas of "localism" and "deregulation" pose a significant threat to the likelihood of achieving the air quality targets.
- There is currently a great focus on the failure of EU vehicle emission standards to have achieved good air quality for all. Whilst important, this discussion distracts from the underlying cause of poor air quality which lies with the unrelenting growth in traffic levels. Whilst it is important that vehicles are as clean as possible, there has been too great a reliance on technological solutions rather than on addressing the wider transport problem itself. Local action on air quality is never likely to be successful within the context of national policies that allow, or even encourage, continual growth in traffic.
- Air quality has not been effectively integrated within policies concerning transport, spatial planning or health at either local or national levels and this has led to it failing to be given due regard in these areas.

#### ABOUT THE AIR QUALITY MANAGEMENT RESOURCE CENTRE AT UWE, BRISTOL

1. The AQMRC is based at the University of the West of England, Bristol and was formed in 1998. Between 1999 and November 2010, it held (in partnership with Air Quality Consultants Ltd.) a contract with Defra (and formerly with DETR) for undertaking management tasks in relation to the Local Air Quality Management process. These tasks included:

- the appraisal of local authority Review and Assessment reports;
- the management of archives of reports and Air Quality Management Area orders;
- the maintenance of databases to record and track these documents and other elements and indicators of progress within the LAQM system;
- the operation of a telephone, email and internet-based helpdesk service to help local authorities with their work; and
- support in the writing and updating of official guidance for Defra and the Devolved Administrations.

2. In addition to the LAQM contract with Defra and the Devolved Administrations, AQMRC has also carried out a wide-range of other LAQM work for UK local authorities. This has included carrying out and providing

**Ev w38 Environmental Audit Committee: Evidence**

---

assistance for review and assessment work and air quality action planning, support and facilitation for consultation and engagement exercises with the public and other key stakeholders, and training provision to enhance capability and capacity, specifically for LAQM but also in related areas of air pollution, climate change, and land-use and transport planning. AQMRC has a significant research background based on air quality management funded by prestigious research organisations including ESRC, NERC and EPSRC. This has generated an extensive peer reviewed publications list, and has allowed the development of a renowned track record in supervising and examining PhD students in the field of LAQM. AQMRC was also instrumental in the design and development of the Institute of Air Quality Management in order to promote and support the increasing number of professionals working in this field.

3. AQMRC are internationally recognised for their leadership in the field and have been involved in a number of major international projects. The group has also had significant involvement in the promotion of the UK LAQM Framework as good practice in a range of contexts, including the EU Framework V INTEGAIRE (Integration of Environmental Governance and Air Quality in Europe) project, the provision of support for the development of air quality capacity in Bangkok Metropolitan Administration, and in the development of the South African National Framework on Air Quality (which used the UK system as a basic model).

4. The AQMRC is a part of the Institute for Sustainability, Health and Environment (ISHE). This is an Institute comprising a wide-range of research groups covering key areas of research into: sustainable communities and the built environment; public health and well-being; and environmental sustainability.

*Causes of particulate and NO<sub>2</sub> air pollution in the UK and how these can be reduced most effectively*

5. The cause of air pollution problems in the UK are predominantly emissions of pollutants from road traffic within environments where there is poor dispersion of pollution and exposure of members of the public.

6. Efforts to reduce pollution from vehicle tailpipes is not working, and is becoming increasingly ineffectual with each new Euro Standard.

7. It is generally estimated that 50% or more of PM<sub>10</sub> related to vehicles is associated with resuspended road dusts. Particularly as PM from exhausts, and tyre and brake wear is reduced this will become a much more significant source. Therefore measures to actually reduce road speeds and flows will become more effective.

8. Problems with nitrogen dioxide are often associated with very low flows of traffic (sometimes <5000 vehicles per day) in narrow streets in small urban locations.

9. Significant efforts need to be made to control and reduce levels of motorised traffic in built-up areas; this can only be done through aligned efforts at national and local levels.

*Impacts on health and the environment from particulate and NO<sub>2</sub> pollution, and how these should be measured*

10. There is not necessarily a problem with how impacts of air pollution are measured, so much as how the measurements are reported. Despite increasing evidence regarding the impacts of air pollution on health (which have shown previous estimates of the impacts to be significant underestimates) there has been little attempt to effectively engage the public over this issue.

11. Defra last asked a question on air quality in their Quality of Life survey in 2001<sup>33</sup>. The response indicated that air quality was the most important of the government's environmental indicators for sustainability with 95% of respondents rating it as either Very or Fairly Important. There is little evidence that the government has taken up this opportunity for engaging the public.

12. Within public engagement work done by AQMRC it is common to find air quality rated higher than climate change as a priority amongst local people, yet this is rarely reflected in messages from national government. This is something that potentially endangers the ability to take effective action on both issues.

13. One problem that is apparent in the recording and reporting of pollution is the discrepancies between modelled pollution concentrations as calculated by Defra for the purposes of EU reporting, and the extent of problems evidenced through the LAQM process. Particularly with regard to PM<sub>10</sub> the national modelling appears to significantly underestimate the scale of the problem in the UK with 59 local authorities in England alone having declared Air Quality Management Areas for PM<sub>10</sub>.

*The effectiveness of the Government's strategy for improving particulate and NO<sub>2</sub> air quality, and how that might be improved*

14. The Local Air Quality Management process as set out and developed by the 1995 Environment Act, 1997 Air Quality Strategy, and successive guidance and strategy revisions has been unsuccessful at delivering the necessary reductions in air pollution to meet domestic objectives and EU limit values because it was never designed to meet the eventual challenge.

---

<sup>33</sup> <http://www.defra.gov.uk/statistics/files/pas-survey2001.pdf>

15. In the mid-1990s, following very successful reductions in pollution emissions from industry, through significant regulation, and from transport through the introduction of catalytic convertors, it was widely anticipated that future measures at a national level would be sufficient to ensure that air quality met necessary standards in all but a handful of locations.

16. The Local Air Quality Management process can be divided into 2 parts: Review and Assessment and Action Planning. The Review and Assessment process was very successful in terms of identifying air quality problems in over 60% of Local Authority areas. A far greater problem than had ever been envisaged when the process was established.

17. The current framework for action planning, where LAs are given the responsibility for devising an action plan and implementing it in relative independence from national government, and with no clear penalties for not achieving objectives, was never devised for a situation where air quality problems were so widespread, and is now out of date.

18. With such extensive problems occurring, it is obvious that the problem, to some extent, exists at a national level and there is therefore a need to pay much closer attention to the interaction between national policies and local problems. One example of this is from the findings of the Sustainable Travel Town Demonstrations<sup>34</sup> that showed that whilst local efforts to reduce traffic might achieve a 9% reduction in trips by local residents, when overall traffic flows were examined, this was reduced to a reduction of only 2% in traffic flows due to the impact of non-local traffic.

19. The LAQM Framework was developed at a time when there was a strong intention to try and tackle growth in road traffic (c.f. The 1997 Road Traffic Reduction Act, 1998 New Deal for Transport White Paper<sup>35</sup>, and 2000 Ten Year Transport Plan). If these intentions had been successful there would have been much less difficulty for Local Authorities in developing and implementing effective local Air Quality Action Plans. However, in the context of national policies failing to effectively limit (and arguably encouraging) growth in transport, the ability of LAs to reduce air pollution is significantly constrained.

*Potential effects of the Government's localism agenda and proposed reforms of public health provision on local authorities' capacity for tackling poor air quality*

20. As described above, we believe that the failure of UK air quality policy in achieving the UK objectives and EU Limit Values lies largely with national government and not local government. Whilst more power and influence at a local level is a good thing, a number of key issues need to be addressed:

21. There must be sufficient statutory obligation on local authorities to tackle air quality to ensure that they prioritise it sufficiently to contribute effectively to the meeting of national targets, and to ensure that environmental protection doesn't become an option, leaving the protection of the health of the most disadvantaged to the chances of a postcode lottery. Local political priorities are rarely decided by the disadvantaged who most often suffer the ill-effects of air pollution.

22. Local action must take place in the context of national policies that support local action and work in the same direction. It is no good cutting local authorities loose and expecting them to tackle the problems caused by a national failure to control road traffic growth.

23. Local authorities need to be adequately resourced in order to carry out effective work in their areas. The first year of the new administration has seen swingeing cuts in local authority budgets that have resulted in a large number of air quality staff being made redundant. We consider it highly unlikely that this will lead to sufficient capacity in local authorities to undertake efficient action on air quality.

24. Whilst much is being made of the proposed move of Public Health from the NHS to Local Authorities, particularly in respect of the potential for linking to environmental health issues, there are some significant problems to be overcome. The greatest of these is the issue of the two-tier Local Authority system in England. Over 50% of English LAs are district authorities rather than unitary, and therefore the proposed health service reforms will establish public health responsibilities at a county level, in a different organisation to environmental health which resides at the district level. Although there is some rhetoric regarding the fact that this will not be a problem and will in fact encourage cross-organisation working, current experience of working with local authorities at the district level suggests that pressures on staff and resources are so tight (resulting in the departure of many members of staff) that it is very hard to envisage how district environmental health departments will be able to actively engage with county level public health teams without clearly ring-fenced resources being allocated to them.

25. AQMRC has been involved in a wide range of research and consultancy work that has involved examining or working across the cross-tier divide between air quality and transport officers, and the experiences generally indicate that inter council communication can form a serious hindrance to the development and implementation of effective policy.

3 June 2011

<sup>34</sup> <http://www.dft.gov.uk/pg/sustainable/smarterchoices/smarterchoiceprogrammes/>

<sup>35</sup> Launched by John Prescott stating "I will have failed if in five years time there are not fewer journeys made in a car"

**Ev w40 Environmental Audit Committee: Evidence****Written evidence submitted by the Transport and Environment**

## COMMITTEE, LONDON COUNCILS

London Councils represents all 32 London boroughs, the City of London, the Metropolitan Police Authority and the London Fire and Emergency Planning Authority. We are committed to fighting for fair resources for London and getting the best possible deal for London's 33 Councils. We lobby on our members' behalf, develop policy and do all we can to help boroughs improve the services they offer. We also run a range of services ourselves which are designed to make life better for Londoners.

This response has been developed by our borough officer Air Quality Steering Group.

## SUMMARY OF COMMENTS

- Road traffic is the main source of particulate and nitrogen dioxide (NO<sub>2</sub>) air pollution in the UK. The increase in the proportion of diesel vehicles over the past 10—20 years has been damaging for urban air quality. Emissions from heating both domestic and commercial buildings also contribute a significant amount to local pollution in London.
- In West London there is the added complication of the presence of Heathrow Airport, the operation of which contributes significantly to a specific nitrogen dioxide hotspot. This situation could deteriorate further as the airport is not yet operating to its permitted maximum capacity.
- The government has relied on advancements in vehicle technology to reach air quality targets, but the anticipated improvements have not materialised. More emphasis needs to be placed on behavioural change than has been given to date.
- The government is encouraging the roll out of wood fuel biomass across the country to meet renewable heat targets, with insufficient regard to urban air quality. Slight alterations to the legislation, such as the Clean Air Act 1993, could deliver a significant reduction in emissions from all medium and large sized boilers going forward.
- There is a wealth of information available about the health impacts of particulate and NO<sub>2</sub> pollution. The most significant health effects are associated with PM<sub>2.5</sub>. The most recent COMEAP report highlights the 340,000 life years lost every year in the UK due to fine particulate air pollution, which equates to approximately 29,000 premature deaths.
- The government's air pollution banding system does not reflect the serious impact of long term exposure to air pollution. Air quality in the UK has a greater impact on mortality than passive smoking, yet this information is not widely available. The health message about poor air quality needs to be much clearer so it can be fully understood by the general public.
- The government does not appear to have a strategy for dealing with PM<sub>2.5</sub>. The government's strategy for dealing with NO<sub>2</sub> is not clear. Given the problems with European Vehicle Emission Standards, we cannot rely on Euro Standard based Low Emission Zones alone to meet the NO<sub>2</sub> Limit Value across London by 2015.
- London local authorities are concerned that the localism agenda could result in the government passing fines, from the European Commission, down to local authorities where air quality does not meet the Limit Values. This would be unreasonable as local authorities have not been given adequate tools and powers to improve air quality.
- The devolution of public health functions could result in better integration of health and air quality policies. However, it is too early to say what benefit this may have on improving air quality in practice. Local directors of public health will need proper support from the Department of Health on air quality matters.

## DETAILED COMMENTS

Detailed comments are provided below in each of the four areas requested by the Committee:

*The causes of particulate and NO<sub>2</sub> air pollution in the UK, and how these can be reduced most effectively*

1. The main cause of particulate and NO<sub>2</sub> air pollution in the UK is road traffic. Emissions arise from the exhaust, and in the case of particulates, also from the general wear of tyres and brakes. Diesel vehicles create significantly more pollution than petrol. The increase in diesel vehicles in the UK over the past 10—20 years has been damaging for urban air quality.

2. In West London there is the added complication of the presence of Heathrow Airport, the operation of which contributes significantly to a specific nitrogen dioxide hotspot. Although surrounded by heavily used parts of the strategic road network including the M4, M25 and A312, airport operation, in terms of passenger and freight transport accessing the airport; the operation of aircraft; and other "on-airport" activities; make a significant contribution to the amount of nitrogen oxides emitted. This leads to exposure of local residential populations to excessive nitrogen dioxide concentrations. The difficulty with regards to reducing emissions from this source is exacerbated by lack of national or local control measures being available. With the landing pattern across London, and the prevailing Westerly winds, Heathrow's pollution levels impact on the rest of

London and therefore undermine efforts to reduce emissions elsewhere in the capital. This situation could deteriorate further as the airport is not yet operating to its permitted maximum capacity.

3. There has been a government assumption that advancements in vehicle technology would be a sufficient to deliver the required improvements in air quality. However concentrations of nitrogen dioxide across London, particularly at roadside, remain very high.

4. A recent piece of research published by DEFRA has revealed that increasingly stringent vehicle emission standards for NO<sub>x</sub>, brought in by Euro Standards, have not been working for diesel vehicles.<sup>36</sup> For diesel cars and vans, the report suggests that there has been little change in total NO<sub>x</sub> emissions over the past 15 years. The report also details that selective catalytic reduction used in Heavy Goods Vehicles, to meet Euro Standards, is ineffective in urban driving conditions. These findings are very significant when considering the most appropriate action to take to work towards the NO<sub>2</sub> Limit Values. Any Low Emission Zone to deal with NO<sub>2</sub> would need very careful consideration and further research into what retrofit technology would be effective in urban areas. Given the findings of the report, it would appear that compliance by simple Euro Standard, i.e. date of vehicle registration, would not be sufficient.

5. A significant proportion of NO<sub>x</sub> emissions in London originate from boilers used to heat domestic and commercial premises. The Clean Air Acts of 1956 and 1968, subsequently replaced by the Clean Air Act 1993, were introduced to deal with smoke, and associated sulphur dioxide (SO<sub>2</sub>), from buildings. The Clean Air Acts have been very effective in the past. A local authority can declare a "Smoke Control Area", in which only authorised fuel can be burned (i.e. smokeless fuel) or, an "exempt appliance" must be installed. Exempt appliances must meet strict smoke emission limits. However the emission standards for smoke, and associated SO<sub>2</sub>, are now out-dated as the pollutants of concern today are PM<sub>10/2.5</sub> and NO<sub>2</sub>. The exempt appliance standards behind the Clean Air Act 1993 could be altered to include appropriate emission standards for PM<sub>10/2.5</sub> and NO<sub>x</sub>. As an example, there is currently no limit on the amount of NO<sub>x</sub> that can be emitted from a gas boiler, however, in a smoke control area, a new gas boiler above a certain size could be required to meet an emission limit such as a dry NO<sub>x</sub> emission rate of <40mg/kWhr. Over time this would decrease NO<sub>x</sub> emissions in London significantly.

6. The governments drive for renewable heat and specifically policies to increase the amount of biomass (wood) burned in the UK is a concern. A recent piece of research undertaken by the Environment Research Group at King's College London has revealed that wood burning already contributes approximately 3g/m<sup>3</sup> to PM<sub>10</sub> in winter, which equates to about 15% of background concentrations. Biomass is being encouraged through the Government's Renewable Heat Incentive (RHI) scheme. A commitment to include strict air quality standards for biomass through the RHI has been progressively watered down by the Government. The Department for Energy and Climate Change (DECC) appears to regard air quality as a barrier to be overcome, rather than an issue that can be helped by Climate Change policies. DECC should be prioritising the roll out of non-combustion renewable energy in urban areas, as this would help with both climate change and air quality targets.

7. DEFRA published a document in 2010 outlining how air quality and climate change policies should be integrated more closely.<sup>37</sup> London Councils understands that this document is aimed at local authorities. One of the key messages in the report is:

"These air quality/climate change co-benefits will be realised through actions such as promoting ultra low-carbon vehicles, renewable sources of electricity which do not involve combustion, energy efficiency measures, and reducing agricultural demand for nitrogen".

Unfortunately, this advice appears to be being ignored by DECC in its desire to achieve its own policy targets for renewable heat.

8. Biomass is being promoted as a low carbon renewable fuel. However, it appears that little regard is being paid to the wider impacts of burning wood, such as the release of black carbon, methane and nitrous oxides and the impact that they have on climate change. There is also a concern about the potential impact on biodiversity from burning wood on such a large scale.

9. Adequate controls over emissions from Combined Heat and Power (CHP) plant in urban areas are required. On-site CHP is being rolled out rapidly to work towards energy efficiency, energy security and carbon reduction targets for new developments. However, this policy is bringing electricity production and associated increases in emissions, back into London.

10. Little attention has been given to date to community engagement to help improve air quality. The government should develop a clear health message about air quality that is easy for everyone to understand and provide a framework for community engagement (see paragraphs 13—15). Local authorities will then be able to build on this message to engage with their local communities. The City of London Corporation has recently been working with businesses to raise the profile of air quality and obtain their help in reducing emissions. During the initial consultation phase with businesses, it was very clear that they were not aware of the problems but were very keen to help, once the health impacts associated with long term exposure to poor

<sup>36</sup> Trends in NO<sub>x</sub> and NO<sub>2</sub> emissions and ambient measurements in the UK [http://uk-air.defra.gov.uk/reports/cat05/1103041401\\_110303\\_Draft\\_NOx\\_NO2\\_trends\\_report.pdf](http://uk-air.defra.gov.uk/reports/cat05/1103041401_110303_Draft_NOx_NO2_trends_report.pdf)

<sup>37</sup> Air Pollution: Action in a Changing Climate <http://www.defra.gov.uk/publications/files/pb13378-air-pollution.pdf>

**Ev w42 Environmental Audit Committee: Evidence**

air quality were explained.<sup>38</sup> All businesses interviewed felt that, given the health effects, air quality should have a higher profile.

11. The London Borough of Harrow has worked with schools to raise the profile of air quality by linking “walk to school” events with air quality. Teaching plans, games and puzzles were developed to highlight the problems of increased air pollution. The feed back from the schools was very positive.

12. In the Royal Borough of Kensington and Chelsea a very active special interest group—the Campaign for Clean Air in London, based within the Knightsbridge Association, often works with the Council in lobbying to improve local air quality. It has been particularly concerned about the prospect fines from the European Commission for failing to meet the PM<sub>10</sub> objective as the 2012 Olympic Games approach.

*The impacts on health and the environment from particulate and NO<sub>2</sub> pollution, and how these should be measured*

13. There is a wealth of information available about the health impacts of particulate and NO<sub>2</sub> pollution. The most significant health effects are associated with PM<sub>2.5</sub>. The government’s advisers, the Committee On the Medical Effects of Air Pollutants (COMEAP) published a report in 2010 which details that 340,000 life years are lost every year in the UK due to fine particulate air pollution, COMEAP say that this could equate to 29,000 premature deaths.<sup>39</sup> An alternative metric put forward, in the same report, is that air pollution in 2008 could have made a contribution to the early deaths, by up to two years, of 200,000 people. This is a very confusing message. If we are to engage the public we need the government to deliver a clear and simple message based on these statistics that is understood by everyone.

14. The current government air pollution banding system, which is used to convey air quality information to the public, is at odds with the European Limit Values. It gives the impression that air pollution is generally “low” in London and occasionally “moderate”. The health information on the DEFRA web site reads:

“Generally if you are young and in a good state of health, moderate air pollution levels are unlikely to have any serious short term effects. However, elevated levels and/or long term exposure to air pollution can lead to more serious symptoms and conditions affecting human health. This mainly affects the respiratory and inflammatory systems, but can also lead to more serious conditions such as heart disease and cancer. People with lung or heart conditions may be more susceptible to the effects of air pollution”.

15. The information fails to convey to the public that air pollution reduces the life expectancy of everyone in the UK, and possibly quite significantly in the most heavily polluted areas. It also fails to convey the impact that poor air quality can have on children. A recent study of children in East London has revealed that the lung capacity of 8 and 9 year-olds is five per cent lower than the national average due to poor air quality. Furthermore, seven per cent of the children have lung function reduced to a level regarded as “hazardous”. This deficit becomes ever more prejudicial in later years. Air quality has a greater impact on mortality than passive smoking, yet this information is not widely available. An effective health message may encourage people to help improve London’s air quality and take simple steps to reduce emissions, for example not leave their vehicle engine idling outside the school gates, or walk rather than using motorised transport. However, there is no incentive to take any action while the public is told that pollution is “low” or occasionally “moderate”, with the following health messages:

“Low pollution: Effects are unlikely to be noticed even by individuals who know they are sensitive to air pollutants”.

“Moderate pollution: Mild effects, unlikely to require action, may be noticed amongst sensitive individuals”.

16. In the UK, we are required to measure PM<sub>10</sub> as total weight in a given volume of air, represented as “microgrammes per metre cubed”. However, PM<sub>10</sub> is made up of a variety of different particle types, some of which are more hazardous to health than others. In order to be more effective at improving health, we should also measure particle type, in addition to mass, and action plans should be developed to deal with the most hazardous particles first.

*The effectiveness of the government’s strategy for improving particulate and NO<sub>2</sub> air quality, and how these might be improved*

17. The government’s strategy for reducing particulate and NO<sub>2</sub> pollution appears to be based on waiting for progressively tighter European Emission standards to deal with the problem. This strategy has not worked, particularly for NO<sub>2</sub>, in large part due to the performance of diesel vehicles. Monitoring data has shown that concentrations of NO<sub>2</sub> have not decreased over the past five years. The 2007 Air Quality Strategy is not focussed on compliance with achieving Limit Values or maximising health benefits, any future strategy should be developed with other departments such as the Department of Health, DECC and the Department for Transport.

<sup>38</sup> [www.cityoflondon.gov.uk/cityair](http://www.cityoflondon.gov.uk/cityair)

<sup>39</sup> The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom, A report by the Committee on the Medical Effects of Air Pollutants (COMEAP) 2010

18. DEFRA will shortly be consulting on their time extension notification for NO<sub>2</sub> and this should contain measures to ensure that we meet the NO<sub>2</sub> Limit Values by 2015. Given the very high levels of NO<sub>2</sub> across London, particularly in the centre, this will be a very challenging and will need to include traffic reduction proposals, in addition to technological solutions. Any Low Emission Zone for compliance with NO<sub>2</sub> Limit Values would need to be based on appropriate retrofit, rather than Euro Standards.

19. Apart from a small number of “priority locations” as designated by the Mayor of London, it appears that no further action is underway to deal with PM<sub>10</sub> in London, as it has been assumed that the UK will comply with the PM<sub>10</sub> Limit Values. This is of concern, as reducing fine particles realises the greatest health benefits. The government doesn’t appear to have a strategy at all to reduce PM<sub>2.5</sub> as we move towards 2020.

*The potential effects of the government’s Localism Agenda and proposed reform of public health provision on local authorities’ capacity for tackling poor air quality*

20. London local authorities are concerned that the localism agenda could result in the government attempting to pass European Commission fines down to local authorities, where air quality does not meet the Limit Values. This would be unreasonable as local authorities have not been given the necessary tools and powers to adequately improve air quality.

21. Other aspects of localism sit uncomfortably with the need for coordinated regional and national action to improve air quality. For instance there has been little advice on robust mechanisms to replace regional planning, i.e. for local authorities “to work together on (*regional*) planning issues”, in which air quality is likely to be a significant consideration. The proposed obligation for developers of large schemes to directly consult the local community is welcome, although already established best practice among the more responsible developers, but does not necessarily result in air quality issues being adequately addressed, or an obligation to target air pollution, especially if the agenda is dominated by other issues. It would be useful if planning conditions could control vehicle routes to a site and the type of vehicles to be used—slot in.

22. The devolution of public health functions could result in better integration of health and air quality policies, but it is too early to say what benefit this may have on improving air quality in practice. Local directors of public health will need proper support from the Department of Health on air quality matters. Recent central government staffing reductions in this area do not inspire confidence that this support will be available. The generic nature of the issue would make it difficult for any local initiatives to achieve major results, except for road closures but this isn’t really practicable. However Area Based traffic scheme like the one in Wallington in Sutton will hopefully deliver some improvements in air quality by smoothing traffic flow and encouraging sustainable modes.

7 June 2011

---

### Written evidence submitted by ClientEarth

#### SUMMARY

- The Government does not have an effective strategy for improving either NO<sub>2</sub> or particulate pollution.
- Legally binding limits for levels of NO<sub>2</sub> continue to be exceeded by huge margins since coming into force on 1 January 2010. These legal breaches are particularly severe in London, where levels of NO<sub>2</sub> are thought to be the worst of any capital city in the EU. Defra is in the process of drawing up a plan for NO<sub>2</sub> prior to submitting a time extension notification to the European Commission. However, Defra’s continued delays in publishing this plan mean that ClientEarth and other concerned groups and individuals are as yet unable to comment on its effectiveness. In delaying publication of this plan, Defra has reneged on a firm commitment made to ClientEarth in the course of pre-litigation correspondence that the plan would be published in May. This delay also means that there will now be insufficient time to allow a public consultation of reasonable length prior to submission of the plan to the Commission by the September deadline.
- The Government and Mayor of London’s approach to tackling PM<sub>10</sub> in London seems to have been to do the bare minimum necessary to avoid the escalation of infringement action by the Commission. The Mayor’s strategy focused on targeting pollution “hotspots” with a number of experimental local measures. The inadequacy of this approach was exposed by the high pollution episodes experienced in March and April 2011, which were the worst since 2007.
- Defra has displayed a lack of good faith and transparency in its dealings with both the Commission and the public in relation to air quality. Defra has resorted to exploiting legal and technical loopholes to project future compliance with limit values, deny current breaches and justify delaying action. It has also repeatedly failed to adequately consult the public on air quality plans.

**Ev w44** Environmental Audit Committee: Evidence

- 
- These failures are symptomatic of a systemic failure in air quality policy and governance. This is partly due to the complex and ineffective legal and institutional framework. The existence of two separate legal frameworks creates confusion over legal duties. The legal framework also fails to provide for effective and dissuasive sanctions in the event of breaches of its provisions, as required by EU law. Instead reliance is placed on judicial review claims being brought by groups and individuals for breaches of air quality laws by the Government, which is wholly inadequate given the cost, complexity and length of time involved in legally challenging government failures in the High Court.
  - The legal framework needs to be streamlined and simplified—this would be consistent with the aims of both the “Red Tape Challenge” and Defra’s “Better Regulation Agenda”.
  - The legal framework also needs to be made effective. This requires effective and dissuasive sanctions to be available where air quality laws are broken by the Government, as required by EU law. This will necessitate an independent regulator being given powers to enforce air quality laws.

**BACKGROUND**

1. ClientEarth is a not-for-profit organisation of environmental lawyers. Our CleanAir programme was launched in July 2009 with the aim of achieving full compliance with air quality laws in London by the start of the Olympic Games in Summer 2012.

2. ClientEarth is a member of the “Healthy Air Campaign” and fully endorses the joint submission made by that umbrella group. We also fully endorse the individual submissions made by Environmental Protection UK and Clean Air in London. After consultation with these groups, ClientEarth has decided to focus on the fourth issue: The effectiveness of the Government’s strategy for improving particulate and NO<sub>2</sub> air quality.

**PARTICULATE POLLUTION**

3. Since the previous EAC report on air quality, the Mayor adopted his final Air Quality Strategy in December 2010. This strategy projected that compliance with PM<sub>10</sub> limit values would be achieved in 2011, so deferred implementation of most measures until 2012 and after. However, the strategy identified a number of priority areas which were most at risk of breaching the daily limit value in 2011, and focused a number of “local” measures on these areas, including:

- a six-month trial of dust suppression techniques along two heavily polluted routes.
- measures to reduce vehicle idling.
- redeployment of the cleanest buses along the most polluted roads.

4. Since the previous EAC report, the Government reapplied for a time extension to meet the daily limit value for PM<sub>10</sub> in Greater London, in accordance with Article 22 of Directive 2008/50/EC (the “Directive”). The Commission rejected the initial time extension notification because it failed to demonstrate that compliance would be achieved by the extended deadline of 11 June 2011. ClientEarth and other groups were highly critical of the revised submission, which did not put forward any additional measures, but merely used alternative monitoring and modelling methodologies to demonstrate that compliance would be achieved by the extended deadline. ClientEarth and other groups repeatedly expressed concern that Defra was using overly optimistic and unreliable methodologies to project compliance in 2011.

5. In March 2011 the Commission approved a time extension for London on the condition that the air quality plan was amended to include short term measures which were:

“... effective for controlling or, where necessary, suspending activities which contribute to the risk of the limit values being exceeded”.

The Commission gave the following reason for imposing this condition:

“In view of the very narrow margin by which compliance in [Greater London] is projected, the Commission considers that there may still be a risk that the daily limit value is exceeded after the exemption period”.

6. London and the South East of England experienced very high levels of PM<sub>10</sub> pollution in March and April 2011. These episodes proved ClientEarth’s and the Commission’s concerns regarding the Government’s plans to be well founded. Defra’s resubmitted time extension notification had projected that there would be 32 exceedances of the daily limit value in the whole of the 2011 calendar year at its favoured monitoring station on the Marylebone Road. However, data from this monitoring station shows that there have already been 40 exceedances of the daily limit value, less than half way through the calendar year.

7. The Government’s response to the Commission’s conditional time extension was to allocate £5million to a “Clean Air Fund” to be used by the Mayor. However, indications are that this money will simply be spent on expanding the local measures contained in the Mayor’s Strategy.

8. The Government has also failed to consult the public on the amendment of the air quality plan to include short term measures, as is legally required by the Air Quality Standards Regulations 2010 (the

“Regulations”).<sup>40</sup> Public participation in the production and amendment of air quality plans is essential to allow concerned groups to scrutinise measures that are being proposed and ensure that they are adequate to prevent further exceedances.

## NO<sub>2</sub> POLLUTION

9. The deadline for achieving compliance with the hourly and annual limit values for NO<sub>2</sub> was 1 January 2010. The hourly limit value sets a maximum of 18 hours in a calendar year in which levels of NO<sub>2</sub> can exceed 200 micrograms per cubic metre (g/m<sup>3</sup>). This maximum was breached in London on 18 January 2010. In total there were 534 exceedances of the hourly limit value in London in 2010, with an annual mean of 98 g/m<sup>3</sup>, almost double the limit value. These are the statistics from the Government’s monitoring station at Marylebone Road. However, there are sites in London where levels of NO<sub>2</sub> are even worse, such as Brixton Road in Lambeth and Putney High Street in Wandsworth. Exceedances of the hourly limit value have continued in 2011, and there has been little or no discernible improvement in mean levels of NO<sub>2</sub>.

10. Unlike the problems with PM<sub>10</sub>, which is principally a London issue, NO<sub>2</sub> limits are being exceeded in urban areas throughout the UK.

11. In light of the breaches of the limit values in London in 2010, ClientEarth issued a “letter before claim”<sup>41</sup> against the Secretary of State for Environment, Food and Rural Affairs (the “SoS”) on 30 November 2010. The letter before claim is a requirement of the pre action protocol, which requires that before applying to the High Court, potential claimants should attempt to resolve the dispute by setting out the grounds of the intended claim and the action that the defendant is expected to take to avoid litigation. The letter alleged, *inter alia*:

- That the SoS had breached her statutory duty under the Regulations by failing to ensure compliance with the NO<sub>2</sub> limit values; and
- That the SoS had unlawfully failed to produce an air quality plan demonstrating how compliance with the limit values would be achieved in the shortest time possible, as required by the Regulations.

12. The letter called on the SoS to acknowledge the breaches of limit values and within three months publish an air quality plan for public consultation which demonstrated how compliance would be achieved by the end of 2012.

13. Defra’s response refused to acknowledge that the limit values had been breached, for a number of reasons. First, they sought to rely on the time extension provisions of the Directive. The Directive allows a member state to postpone compliance with the NO<sub>2</sub> limit values until January 2015, with the approval of the Commission, if it produces a credible strategy which demonstrates that compliance will be achieved by the extended deadline. However, Defra had not at that time, and still has not, published the air quality plan, let alone had the time extension notification approved by the Commission.

14. Defra also claimed it was not possible to confirm whether limit values had been breached in January 2010 until several months into 2011. In doing so they relied on a provision in the Directive which gives member states to report exceedances of limit values to the Commission by no later than nine months after the end of the calendar year in which the exceedance took place.<sup>42</sup> Their reliance on this provision and failure to acknowledge these exceedances in the face of incontrovertible evidence from their own monitoring stations was in ClientEarth’s view a cynical attempt to justify its indefensible failure to act promptly to tackle NO<sub>2</sub> in London.

15. After careful consideration, ClientEarth eventually decided to put legal action on hold, relying on Defra’s commitment to publish its draft air quality plan for public consultation in May. Despite this commitment, we have now been informed that the plan will now not be published until June. In response to an earlier complaint by ClientEarth in 2009, Defra had previously assured us that the time extension notification would be published for public consultation in 2010.

16. Defra’s repeated delays in publishing its air quality plan have also meant that a reasonable timescale for public consultation is no longer possible. The Regulations require that reasonable timescales are allowed for public consultation. The relevant code of practice recommends that “*Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible.*”<sup>43</sup> Given the severity of the NO<sub>2</sub> problem and the complex technical information which consultees need to digest in order to properly scrutinise air quality plans, 12 weeks would be the minimum reasonable timescale in the circumstances. However, even if Defra publish the draft plan in the next week, there will not be sufficient time to hold a 12

<sup>40</sup> Regulation 28 provides that the Secretary of State must consult the public where the Secretary of State proposes to prepare, modify or review an air quality plan or a short-term action plan. It also requires the Secretary of State to inform the public of the proposal, any relevant background information and the right of the public to participate. The Secretary of State must allow a reasonable timescale for the consultation.

<sup>41</sup> The letter before claim is a requirement of the pre action protocol, which requires that before applying to the High Court, potential claimants should attempt to resolve a legal dispute by setting out the grounds of the intended claim and the action that they expect the defendant to take in order to avoid litigation.

<sup>42</sup> Article 27, Directive 2008/50/EC.

<sup>43</sup> HM Government, “Code of Practice on Consultation” (July 2008).

**Ev w46 Environmental Audit Committee: Evidence**

---

week consultation and take responses into consideration before finalising the plan and submitting it to the Commission by the end of September.

17. Because of these delays, we are as yet unable to comment on whether the Government has an effective strategy for reducing NO<sub>2</sub> pollution. If the plan does not contain credible measures which demonstrate that the limit values will be achieved within the shortest time possible, and no later than 1 January 2015, ClientEarth will, as soon as practicable, seek permission for judicial review in the High Court in relation to the SoS's breach of statutory duties.

18. The Mayor's Air Quality Strategy does not contain sufficient measures to achieve compliance by January 2015. However, it makes a number of recommendations for measures that need to be taken by the Government to achieve compliance by that date. However the Government has not committed itself to adopting these measures.

**RECOMMENDATIONS**

19. There is clearly a lack of political will to implement the ambitious measures which are necessary to ensure limit values are complied with and human health protected. However, underlying this is an ineffectual and overly complex legal framework which urgently needs strengthening and simplifying. The Government is able to repeatedly fail to meet its legal obligations in relation to air quality because the legislation does not provide for effective and dissuasive sanctions.

20. ClientEarth's previous submission to the EAC (attached) made a number of recommendations for simplifying and improving the legal framework governing air quality. These recommendations were not adopted. However, events since the previous EAC report have strengthened the case for reform of the legislative and institutional framework. These include:

- The lack of progress in achieving compliance with limit values for PM<sub>10</sub> and NO<sub>2</sub>.
- Defra's tactics of delay, denial and obfuscation in its dealings with both the Commission and ClientEarth.
- The recent introduction of the Civil Sanctions regime and the Environmental Tribunal, which mean that the legal architecture is now in place which would facilitate effective enforcement of air quality laws by an independent regulator.

21. This submission therefore repeats the recommendations made in our first submission, with some refinement to take into account recent developments.

*Recommendation 1*

22. The existing legal framework should be consolidated so that there is only one legal framework which incorporates the requirements of the Directive and the system of local air quality management currently laid down by the Environment Act 1995. The consultation document accompanying the transposition of the Directive stated that Defra is already considering taking this step. This would clarify the legal duties and powers of central government, local authorities and devolved administrations such as the Mayor of London in delivery air quality improvements. This would also be consistent with the aims of both the "Red Tape Challenge" and Defra's "Better Regulation Agenda". This would also be an ideal opportunity to make further amendments to improve the effectiveness of the legal system. (see recommendation 2)

*Recommendation 2*

23. The consolidated legal framework should provide for effective and dissuasive penalties where local, central or devolved government fail to comply with statutory duties in relation to quality.

24. While the Regulations place a legal duty on the SoS to ensure compliance with limit values, they do not impose any penalties for failing to do so. This is a failure to implement Article 30 of the Directive which requires that:

"Member States shall lay down the rules on penalties applicable to infringement of the national provisions adopted pursuant to this Directive and shall take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive".

25. Defra justified their failure to implement this requirement on the basis that there were judicial review remedies available for infringements by the SoS. However, judicial review remains expensive, time-consuming, and the High Court is ill equipped to deal with the complex technical issues raised in disputes relating to air quality.

26. A system of effective, proportionate and dissuasive penalties for breaches of air quality laws would not be possible under the existing institutional framework, as central government (i.e. Defra) is responsible for assessing compliance with air quality limit values and drawing up and implementing plans. It would clearly be absurd if the SoS was to impose a penalty against herself for her own failure to ensure compliance with limit values. Some reconfiguration of the institutional framework is therefore necessary.

---

27. An independent regulator should be given legal responsibility for enforcing compliance with air quality limit values and scrutinising regional and national air quality plans. To carry out this function, this regulator would need to have considerable autonomy from the Government, and be granted wide statutory powers, including the power to give directions to the Government, and where these directions are not followed, enforce them through the courts. The Environment Agency would seem to be the most appropriate body for this role, although it would need considerable additional funding to enable it to carry out these functions.

28. Since the previous EAC inquiry, environmental regulators including the Environment Agency have been given a range of flexible enforcement tools under the civil sanctions regime, which came into force on 6 April 2010.<sup>44</sup> These include the following sanctions:

- Compliance Notices—a regulator’s written notice requiring actions to comply with the law or to return to compliance, within a specified period.
- Stop Notices—a written notice which requires an immediate stop to an activity that is causing serious harm or presents a significant risk of causing serious harm.
- Fixed and variable monetary penalties.

29. Currently civil sanctions are only available to regulators for certain types of breaches of environmental law by private entities. However this could be widened to include breaches of air quality limit values. These would give the independent regulator a flexible range of sanctions to ensure compliance with air quality laws without recourse to the courts.

30. Appeals against civil sanctions can be made to the Environmental Tribunal, which was established in January 2011. This would give the SoS the opportunity to appeal against any directions or fines issued by the regulator. The Environmental Tribunal is a more appropriate forum for environmental disputes than the High Court, as it has a remit to develop expertise in the complexities of environmental law and policy, and can call on technical experts as well as judges when hearing appeals.

31. Third parties, including environmental and health groups and individuals should also be given access to the Environmental Tribunal to appeal decisions by the regulator, in addition to breaches of air quality limit values and adoption of air quality plans. This would be consistent with the UK’s obligations under the Aarhus Convention,<sup>45</sup> which requires that concerned groups and individuals have access to a review procedure where there environmental laws are breached. This would also be consistent with the aims of the Government’s “Big Society” initiative, as it would empower groups and individuals to protect the health and environmental quality of their communities from air pollution.

### *Recommendation 3*

32. The EAC should call on the Government to appoint a cross-governmental “Clean Air Task Force” to draw up a new National Air Quality Strategy. This strategy should include the Government’s plans for achieving NO<sub>2</sub> and PM<sub>10</sub> limit values in the shortest time possible in those zones where there are currently exceedances, as well as more long-term policies for achieving the best possible air quality in order to maximise health gains. The strategy should contain firm commitments to timetables for implementing measures and reasonable estimates of air quality improvements that can be achieved by these measures.

### *Recommendation 5*

33. The EAC should call on the Government to hold a public consultation on the amendment of the PM<sub>10</sub> air quality plan for London, and commit to holding proper consultations when drawing up or amending air quality plans.

### *Recommendation 6*

34. The EAC should call on the Government to produce a credible, ambitious and robust air quality plan for NO<sub>2</sub> which complies with all statutory requirements, including achieving compliance with the limit values in the shortest time possible. The NO<sub>2</sub> air quality plan for London should as a minimum adopt all the recommendations included in Policy 13 of the Mayor’s Air Quality Strategy.

*3 June 2011*

---

<sup>44</sup> The Environmental Civil Sanctions (England) Order 2010.

<sup>45</sup> The UNECE Convention on United Nations Economic Commission for Europe, Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus, Denmark, 25 June 1998, Article 9.

**Ev w48** Environmental Audit Committee: Evidence

---

**Written evidence submitted by the Institute for Air Quality Management**

1. The Institute for Air Quality Management (<http://www.iaqm.co.uk/index.html>) is the UK's professional body for those working in the field of air quality management. The Institute of Air Quality Management (IAQM) seeks to maintain, enhance and promote the highest standards of working practices in the field of air quality and for the professional development of those who undertake this work.

2. The IAQM does not develop policy, but it generally commends the approach put forward to the Audit Committee by Environmental Protection UK.

3. The Environmental Audit Committee has requested responses in each of four areas. The IAQM have summarised in a few words its view of current understanding in these areas.

*Question: The causes of particulate and NO<sub>2</sub> air pollution in the UK and how these can be reduced most effectively*

Answer It is not easy to reduce these pollutants as technical measures have mostly delivered what they can.

*Question: The impacts on health and the environment from particulate and NO<sub>2</sub> pollution, and how these should be measured*

Answer The impacts are thought to be large, so that the broad solution is clear. The precise linkages are subject to considerable uncertainty, making decisions as to what is the most appropriate action in local situations difficult.

*Question: The effectiveness of the Government's strategy for improving particulate and NO<sub>2</sub> air quality, and how that might be improved*

Answer It is unclear what the strategy is, but it appears to be based mainly on non-technical local action. Local action in the community is to be encouraged by ensuring that there is sufficient local support.

*Question: The potential effects of the Government's localism agenda and proposed reforms of public health provision on local authorities' capacity for tackling poor air quality*

Answer These are mechanisms for increasing support for local non-technical measures which may be unpopular with some sections of the local community. In theory, the proposed public health measures present an opportunity for addressing air quality issues in a unified manner with a firm focus on achieving health benefits, rather than "ticking a box" to confirm that certain processes have been carried out. The IAQM has serious reservations about the possible impacts of localism given some of the measures proposed in recent months. In particular the proposed redrafting of Planning Policy Statements by DCLG and the forthcoming third round of Local Transport Plans appear to relegate air quality to a minor issue which can largely be ignored. Localism could accentuate the use of the motor vehicle and road transport in the short term, especially in south east England.

4. If there is broad consensus on the above, then the serious issue facing the air quality management profession is that the right local measures on improving air quality, although highly desirable, may be difficult to determine. The UK Government needs to ensure that the quality of the evidence which supports local action is good enough and can deliver better air quality. The IAQM have grave concerns that the evidence may not be good enough, resulting in local criticism, loss of credibility, and repercussions from Europe over whether European legislation is being implemented properly.

5. The UK Government should adopt a leadership role to ensure that the latest knowledge and science is incorporated into the local air quality management system. There is a need for continual update and review of current science and understanding.

6. The role of Europe in UK environmental policy is now dominant. The EU Air Quality Directive will be revised in 2013. Examples of relevant questions for UK action are:

- Does the effort on particulate matter and NO<sub>2</sub> fairly reflect the degree concern over these pollutants?
- Should more attention be paid to ammonia if the country is concerned with critical loads, either to address acidification or an excess of nutrients?

7. There is a lack of guidance on implementing EU Directives. The FAIRMODE (Forum for Air Quality Modelling in Europe) and AQMEII (Air Quality Modelling Evaluation International Initiative) programmes are making international comparisons of air quality practice, but will their deliberations and Commission staff papers be consistent with UK expert opinion, and fairly reflect uncertainties? In contrast, in the UK detailed advice has been available on how local air quality management legislation should be carried out, following much consultation.

8. There needs to be effective leadership within Government to ensure that local air quality management, in operation, is subject to the highest standards. The IAQM is not confident that the present departmental system,

which has a tendency to adopt a silo mentality and short-term thinking, is able to tackle the broad and undoubtedly difficult policy measures relating to further improvement in air quality. It must also engage fully in discussions with Europe to ensure that UK experience and practice is taken into account when European requirements are drafted.

9. At the present time the reduction in resources available to local air quality management as the budget deficit is addressed should not be ignored. Reductions in experienced professional staff, in the monitoring of air quality and in the scope of assessment activities are to be expected. Thus the need to address the national leadership role is even more important, in order that the resources and priorities assigned to air quality management are balanced correctly in the overall national interest.

6 June 2011

---

### Written evidence submitted by Johnson Matthey PLC

#### 1. BACKGROUND

Johnson Matthey welcomes this new inquiry into air quality, and would like to comment in particular on the steps that need to be taken to ensure that air quality targets will be met in the future.

As one of the largest UK companies in the chemicals sector, Johnson Matthey has been supplying catalysts for the control of air pollution since the late 1960's and has supplied one third of all autocatalysts made since production first started in 1974. Johnson Matthey has 15 manufacturing sites and 9 technology centres supporting our emission control technologies business around the world.

The technologies developed at Johnson Matthey have made it possible to reduce oxides of nitrogen (NO<sub>x</sub>), hydrocarbons (HC) and carbon monoxide (CO) from petrol powered vehicles by over 95% from pre-regulation levels.

Johnson Matthey has also developed diesel particulate filter (DPF) technologies to reduce emissions of the mass of particulate matter (PM) from diesel engines by over 90% and the number of particles by over 99%. Johnson Matthey is the owner of CRT<sup>®</sup> and SCRT<sup>®</sup> technology that is licensed to Eminox Ltd for supply to the UK retrofit market.

The Johnson Matthey SCRT<sup>®</sup> system combines CRT<sup>®</sup> DPF technology with selective catalytic reduction (SCR) to reduce emissions of all four regulated pollutants from diesel engines.

#### 2. SUMMARY OF KEY POINTS

- Johnson Matthey's December 2009 response to the previous inquiry contains information relating to specific emissions reduction options.
- Johnson Matthey welcomes the importance placed by the Committee on improving air quality.
- Central government has a key role to play in incentivising and encouraging lower emissions from combustion sources, in particular transport, through low emissions schemes as well as through stricter planning guidance.
- Localism can play an important part in enforcement of local air quality improvement schemes, and in enforcing planning conditions, but clear direction from central government will be essential.
- It was encouraging that the previous inquiry identified a National Framework for Low Emission Zones as an important strategy in bringing about air quality improvement.

#### 3. CENTRAL GOVERNMENT'S ROLE IN IMPROVING AIR QUALITY

Johnson Matthey acknowledges that the Government wishes to devolve decision-making on a number of policy issues to local authorities. As transport and related emissions are by nature mobile, central Government does have a role to play in providing strong direction. This will ensure that a high level of consistency is applied when creating low emission zones that could affect vehicles and machinery operating across the country.

In spite of the financial constraints facing the Government, the Committee's conclusion from the last inquiry that potential fines should be included in any cost-benefit analysis should be heeded and used to provide incentives to operators to upgrade their vehicles and fleets.

#### 4. LOCAL AUTHORITIES' ROLE IN IMPROVING AIR QUALITY

Enforcement of air quality improvement tools such as low emission zones is clearly a role for local authorities, but risk being ineffective if not applied within a tight framework. With many local authorities facing resourcing issues in the field of air quality, clear guidance is needed so they have a narrow range of realistic options to choose from.

Planning conditions can and should be used to enforce use of the lowest emitting construction machinery on sites, whether new or retrofitted with diesel particulate filters. This approach is being developed in London and should be rolled out to the rest of the country under guidance from central Government.

**Ev w50 Environmental Audit Committee: Evidence**

---

**5. NATIONAL FRAMEWORK FOR LOW EMISSION ZONES**

It is encouraging that Defra and DfT have started to look at the possibility of implementing a National Framework for Low Emission Zones since the Committee reported on its last inquiry. Johnson Matthey has been actively engaged in the process, contributing to discussions on NO<sub>x</sub> certification for retrofit equipment.

We would encourage the Committee to ensure that Government departments not only use this process to inform the report to the European Commission requesting a delay to the UK's obligation to meet limits on NO<sub>2</sub>, but also take the recommendations forward to full implementation of a framework within a defined timescale. Such a framework must give very clear and targeted recommendations to local authorities to implement effective low emission zones.

London, through the Mayor's Air Quality Strategy, is already asking for Government assistance in the form of a NO<sub>x</sub> certification scheme, as well as funding for implementation. This assistance should be readily forthcoming, particularly if set against the size of potential fines from Europe.

I hope you will find these comments helpful, and will be happy to respond to any clarification you might need.

8 June 2011

---

**Written evidence submitted by the Mayor of London****SUMMARY**

- The Mayor of London's Air Quality Strategy includes a range of measures to reduce emissions from the transport network, homes and workplaces that will ensure that in a normal meteorological year, London would comply with PM<sub>10</sub> limit values. To provide additional reassurance, Transport for London (TfL) is implementing a £5 million Clean Air Fund for targeted measures at hotspots in central London.
- Meeting NO<sub>2</sub> limit values is much more challenging and is a problem in many urban areas in the UK. The Government needs to implement national measures such as tax incentives for cleanest vehicles, a NO<sub>x</sub> abatement certification scheme, scrappage schemes and incentives for vehicle retrofit. The Government also needs to provide local authorities with technical assistance and resources to develop local NO<sub>2</sub> abatement measures.
- Emerging evidence shows that the poor performance of recent Euro standards for cars may be responsible in large part for the failure to meet NO<sub>2</sub> limit values. The European Commission should commit to reviewing real-world emissions from Euro 6 vehicles as soon as they are on the market and bringing forward changes to the vehicle testing regime if necessary.
- The Government should consider a cross-departmental national air quality strategy that would maximise benefits across different policy areas while addressing potential conflicts. It should also provide clear policy guidance to local authorities.
- Further research is needed into the morbidity impacts of poor air quality as well as the impacts of NO<sub>2</sub> pollution. This would provide useful evidence for policy makers at all levels of government.
- To support the localism agenda, air quality awareness-raising campaigns are required at local and national government level, to help communities play their part in air quality management.
- The Mayor welcomes the proposed devolution of public health functions to local authorities, as this could lead to better integration of health and air quality policies. However, devolution must be accompanied by the provision of appropriate resources to local authorities. The Department of Health should also take a lead in promoting the health benefits of air quality improvement measures.
- The Mayor is concerned by proposals in the Localism Bill for EU fines to be passed on to local authorities without corresponding delegation of funds, resources and powers. He is therefore committed to working with Ministers to develop a methodology that ensures that any allocation of fines takes into account resources and responsibilities.

**INTRODUCTION**

1. The Mayor of London welcomes the opportunity to provide a written submission to the Environmental Audit Committee. The Mayor, along with Environment Director—Kulveer Ranger, is committed to improving air quality in London to protect the health of its citizens.

2. The Mayor is required under the Greater London Act 1999 to prepare an Air Quality Strategy. This must contain the Mayor's policies and proposals for the implementation in Greater London of the Government's Air Quality Strategy for England, Scotland, Wales and Northern Ireland, as well as for achieving air quality standards and objectives prescribed in regulations under the Environment Act 1995. The Mayor published his Strategy on 14 December 2010 and implementation is now underway.

3. The Mayor works closely with the Government on joint action to improve air quality in London. This includes a commitment to assist the Government in limit value time extension notifications for both particulate matter (PM<sub>10</sub>) and nitrogen dioxide (NO<sub>2</sub>).

---

## AIR QUALITY IN LONDON

### *Particulate Matter (PM<sub>10</sub>)*

4. Modelling carried out for the development of the Mayor's Strategy showed that in 2011, if it was a normal meteorological year, all of London would be compliant with PM<sub>10</sub> limit values. However, at a small number of locations in central London along major roads, compliance would be by a small margin.

5. Even at the kerbside of busy roads in central London (with high levels of local emissions) around 40% of PM<sub>10</sub> pollution originates from outside London. Significant sources of PM<sub>10</sub> within central London include cars (responsible for around a quarter of central London emissions), taxis (also responsible for a quarter) and LGVs (responsible for 10 to 20%). Considerable efforts have been made to reduce the emissions from buses, which now contribute less than 10% to PM<sub>10</sub> in central London.

6. Around 35% of PM<sub>10</sub> emissions in 2008 from road transport in central London came from tyre and brake wear, and this is projected to increase to around 40% in 2011, and 55% in 2015 as exhaust emissions of PM<sub>10</sub> are expected to reduce. Emissions of PM<sub>10</sub> from car tyre and brake wear are now greater than those from car exhaust emissions and over the next five years, this is also expected to become the case with heavier vehicles such as HGVs and buses. This reflects the fact that measures have been taken to reduce emissions from exhausts but similar reductions have not been achieved for tyre and brake wear emissions, largely because there are no technical improvements affecting tyre and brake wear on the market.

7. Spring 2011 saw some of the highest levels of PM<sub>10</sub> concentrations in London for eight years. Analysis from King's College London suggests that much of the responsible pollution was blown in by easterly winds from continental Europe. During the April air quality episode, around 80% of PM<sub>10</sub> pollution at background locations and 60% of pollution at roadside locations was caused by pollution from outside London, including much from continental Europe. The Mayor has raised with the European Commission the need for tighter emissions limits for all Member States, to reduce the amount of transboundary pollution that can have a considerable impact on London's air quality.

### *Fine particulate matter (PM<sub>2.5</sub>)*

8. Air quality modelling suggests that almost all of London, including all urban background locations, is already compliant with PM<sub>2.5</sub> limit values. It is expected that all locations with relevant public exposure will be compliant with the limit values by their relevant dates. The sources of PM<sub>2.5</sub> in central London are very similar to those of PM<sub>10</sub>. Therefore, many of the measures designed to reduce PM<sub>10</sub> concentrations will also address PM<sub>2.5</sub>.

### *Nitrogen dioxide (NO<sub>2</sub>)*

9. Modelling for NO<sub>2</sub> shows that a number of locations across central and inner London exceed the annual mean NO<sub>2</sub> (2010) EU limit value. At some of these locations the limit value is exceeded by a factor of two or more. Concentrations at a number of kerbside or roadside monitoring sites near busy roads also exceed the hourly mean EU limit value, although these short-term concentrations can be strongly influenced by local conditions and sources (e.g. road works and traffic diversions) and are generally confined to locations within a few metres of main roads. This is not untypical for an urban environment and is also observed in other UK and European cities.

10. Emissions from road transport and domestic gas dominated Greater London's NO<sub>x</sub> emissions in 2008, contributing 46% and 22% respectively. NO<sub>x</sub> emissions from commercial gas, industry, airports, and rail are all estimated to contribute around 7 to 8% of emissions in 2008.

11. NO<sub>2</sub> levels have not fallen in recent years as modelling had predicted. This is a problem across major cities in the UK and across the EU. Emerging evidence, including a report by King's College London, suggests that this may be due to the failure of recent Euro standards to deliver expected reductions of NO<sub>2</sub><sup>46</sup>. A Euro 5 car, for example, emits around five times as much direct NO<sub>2</sub> as a fifteen year old car.

12. The Mayor has raised this problem with the European Commission, urging it to review real world emissions from Euro 6 cars as soon as they are on the market. If necessary, changes to the testing regime, including the introduction of a NO<sub>2</sub> emissions limit, should be introduced as quickly as possible.

### *Implementing the Mayor's Air Quality Strategy*

13. The Mayor's Air Quality Strategy<sup>47</sup> includes a number of measures aimed at reducing emissions from sources within the Mayor's control, including the transport network, homes and workplaces. It was developed in conjunction with Mayoral strategies for transport, energy and climate change, and the overarching London Plan for strategic development. It builds on measures already underway, including the Low Emission Zone (LEZ) Phases 1 and 2 (Euro III standard for PM for buses, coaches and HGVs), the taxi retrofit programme,

<sup>46</sup> See [http://uk-air.defra.gov.uk/reports/cat05/1103041401\\_110303\\_Draft\\_NOx\\_NO2\\_trends\\_report.pdf](http://uk-air.defra.gov.uk/reports/cat05/1103041401_110303_Draft_NOx_NO2_trends_report.pdf)

<sup>47</sup> See [www.london.gov.uk/air-quality](http://www.london.gov.uk/air-quality)

**Ev w52 Environmental Audit Committee: Evidence**

smarter travel schemes and improvements to the cycling infrastructure. The main new measures in the Strategy are:

- Age limits for taxis and PHVs from 2012, to remove the oldest, most polluting vehicles from the roads.
- Source London, which will provide the infrastructure to enable 100,000 electric vehicles to be on London's streets by 2020 if not sooner.
- Putting 300 hybrid buses into service by the end of 2012.
- Retrofitting older buses so that they meet the Euro IV for NO<sub>x</sub> standard by 2015 (subject to Government funding).
- Including larger vans and minibuses in the LEZ from 3 January 2012, with a Euro 3 standard.
- Tightening the LEZ standard for HGVs, buses and coaches to Euro IV for PM from 3 January 2012.
- Including a NO<sub>x</sub> standard in the LEZ from 2015.
- Emissions standards for new biomass boilers and CHP.
- Updating construction and demolition best practice guidance and making it Supplementary Planning Guidance.

14. The Strategy also includes local measures for the small number of locations in central London that modelling shows would be at risk of exceeding PM<sub>10</sub> limit values in 2011. Already TfL has undertaken a trial of dust suppressant technology in central London, the results of which will be published in the summer. TfL has also ensured that the cleanest buses are routed along roads in air quality hotspots.

15. The Department for Transport (DfT) has recently provided a £5m Clean Air Fund to TfL to extend the local measures approach. Measures that will be implemented through this fund include:

- Measures to reduce vehicle idling, targeting coaches, buses and taxis, and including taxi management, awareness raising, signage and enforcement (where necessary).
- Power cleaning of flyovers, underpasses and other priority locations.
- Extension of dust suppressants (depending on results of trials).
- Retrofit of buses using Upper Thames Street, Marylebone Road and Park Lane.
- Installing green infrastructure, including green walls and vegetated barriers.
- Working with businesses to reduce their air quality footprint.

16. At the end of the year-long programme, TfL will produce a report on the implementation and effectiveness of these measures that will be shared with DfT. It is hoped that this will inform the application of local measures elsewhere in the UK.

*What the Mayor's Strategy will achieve*

17. The measures in the Mayor's Strategy, along with natural fleet turnover is expected to reduce PM<sub>10</sub> emissions in central London by around 13% by 2011 and by about a third by 2015, providing increased confidence of long-term compliance with PM<sub>10</sub> limit values.

18. Modelling shows that NO<sub>x</sub> emissions in Greater London will fall from 56,000 tonnes in 2008 to 45,000 tonnes in 2011 and 36,000 tonnes in 2015 as a result of the measures in the Mayor's Strategy and natural fleet turnover. This amounts to a reduction in NO<sub>x</sub> emissions across London of 35% by 2015 compared to levels in 2008. However, even this scale of reduction will not prevent some roadside locations in inner London, along with roadside areas near Heathrow Airport, from exceeding NO<sub>2</sub> limit values in 2015

**THE GOVERNMENT'S STRATEGY FOR IMPROVING AIR QUALITY**

19. Measures to be implemented by the Mayor alone will not be sufficient to meet NO<sub>2</sub> limit values by 2015. A number of other urban areas across the UK are also currently exceeding NO<sub>2</sub> limit values. It is therefore clear that the Government needs to implement national measures.

20. The Mayor welcomes the Government's commitment in its Coalition Agreement to "work towards European air quality standards". However, as yet there have been few actions taken to meet NO<sub>2</sub> limit values. It is understood that Defra will shortly be consulting on its action plan for NO<sub>2</sub>. This is an opportunity for the Government to set out clearly the steps that will be taken to reduce NO<sub>2</sub> concentrations across the UK, including in London. Measures that the Mayor is seeking to be included in the national action plan include:

- A certification scheme for NO<sub>x</sub> abatement equipment, to allow Low Emission Zone schemes across the country to include a NO<sub>x</sub> standard.
- An accompanying national framework for Low Emission Zones, to reduce the administrative burden on local authorities that want to implement schemes.
- Scrappage schemes for LGVs, vans, minibuses and taxis to encourage the uptake of the newest, cleanest vehicles.
- Incentives or grants to encourage NO<sub>x</sub> retrofit of older heavy duty vehicles.

- Tax incentives to incentivise the uptake of new Euro 6/VI vehicles.
- Amendments to the VED regime so that it recognises air quality emissions as well as CO<sub>2</sub> emissions.
- Increased funding for technological development of low-emission vehicles.
- Restructuring of funding for energy efficiency schemes.

21. However, a full review of the Government's overall air quality strategy is overdue. It is welcome that DfT is increasingly considering air quality impacts in policy decisions. However, other Government departments with a role in air quality management, including DECC and DH, have shown little interest in emission reduction policies.

22. A cross-departmental strategy would help to maximise benefits across different policy objectives (eg. low emission technology, behaviour change, health awareness) while addressing potential conflicts (eg. increased numbers of biomass boilers, perverse incentives for diesel cars).

23. A new strategy would also provide an opportunity to provide guidance to local authorities on local air quality management. The Mayor welcomes the efforts made by Defra to engage with local authorities and encourage the spread of best practice. However, the Government needs to make clear to local authorities the benefits of specific measures and advice on implementation. This would help local decision-makers to identify the most cost-effective policy interventions at a time of scarce resources.

#### THE IMPACTS ON HEALTH OF AIR POLLUTION

24. The Mayor welcomes the recent assessment of the health impacts of long term exposure to air pollution by the Committee on the Medical Effects of Air Pollution (COMEAP)<sup>48</sup>. This concluded that poor air quality contributed to 29,000 premature deaths in the UK in 2008, which is consistent with the results of a study commissioned by the GLA that estimated that poor air quality in London contributed to around 4,300 deaths in 2008. Such figures are useful when communicating to the public and policy-makers the need for air quality improvement measures.

25. The impact of air quality on premature deaths is, however, only part of the picture. There is still no clear evidence of the health costs that would be avoided by improvements to air quality. The Mayor therefore calls on the Government to undertake further research to assess the morbidity impacts of poor air quality, including costs of treatment and absence from work.

26. The majority of research into the health impacts of poor air quality focuses on fine particulate matter (PM<sub>2.5</sub>). At a time when all levels of government are being required to address concentrations of NO<sub>2</sub>, further research needs to be undertaken that would help to justify expenditure on NO<sub>2</sub> reduction schemes.

#### THE LOCALISM AGENDA AND PUBLIC HEALTH REFORM

27. Air quality is a highly technical subject and it is sometimes difficult to engage people in the topic. The Mayor therefore supports awareness-raising programmes at all levels of Government that would help raise the profile of air quality as a serious public health issue. This would help communities to get involved in air quality improvement schemes and to register their concerns with local politicians.

28. The Marmot Review<sup>49</sup> highlighted the considerable economic and social benefits that would result from reducing health inequalities. Disadvantaged communities tend to live along major roads which often experience poor air quality, so improving air quality could contribute greatly to reducing health inequalities.

29. The devolution of public health functions to local authorities provides an opportunity for better integration of air quality and health improvement schemes. The inclusion of an air quality public health indicator in the Government's proposals should help to ensure that local authorities consider air quality improvements in developing health policies, in the same way that air quality is increasingly integrated into transport policies at London borough level, due to the inclusion of air quality advice in guidance for Local Implementation Plans. However, the devolution of public health responsibilities to local authorities must be accompanied by the provision of appropriate resources, including resources for local air quality management.

30. The Localism Bill includes provision for EU fines, including potential air quality fines, to be passed on to local authorities. The Mayor is concerned about the concept of delegating fines without also delegating the funds, resources and powers to take the steps necessary to avoid the fines. He is therefore committed to working with Ministers to develop a methodology that ensures that any allocation of fines takes into account resources and responsibilities.

8 June 2011

<sup>48</sup> See <http://comeap.org.uk/images/stories/Documents/Reports/comeap%20the%20mortality%20effects%20of%20long-term%20exposure%20to%20particulate%20air%20pollution%20in%20the%20uk%202010.pdf>

<sup>49</sup> See <http://www.marmotreview.org/AssetLibrary/pdfs/Reports/FairSocietyHealthyLives.pdf>

**Ev w54 Environmental Audit Committee: Evidence**

---

**Further written evidence submitted by the Mayor's Office Greater London Authority**

Earlier this month, the GLA submitted written evidence to the Environmental Audit Committee's follow-up inquiry into air quality. As part of that inquiry, Professor Frank Kelly gave evidence to the Committee on 8 June and I would like to clarify some of the remarks that he made regarding policies in Greater London.

Professor Kelly stated that targeted cleaning and application of dust suppressants is not the way forward because "we need to be dealing with the source emissions". We agree with Professor Kelly that reducing emissions is vital. That is why the focus of the Mayor's Air Quality Strategy is to reduce emissions through measures such as tightening the Low Emission Zone (LEZ) standards, age limits for taxis and PHVs, further improvements to the bus fleet (including more hybrid and Euro V buses and use of bus retrofit technologies) and energy efficiency programmes. Yet re-suspended particles contribute significantly to levels of pollution in central London and a responsible air quality strategy that aims to improve public health needs to address this problem. That is why transport for London (TfL) has trialled targeted street cleaning and the application of dust suppressants.

The outcomes of the six-month trial are currently being collated by TfL and a detailed report will be published shortly. However, initial analysis indicates that the application of Calcium Magnesium Acetate (CMA) has been effective in reducing kerbside 24-hour concentrations of PM10 along Victoria Embankment by up to 20%. Additional analysis will be undertaken to further optimise the use of targeted cleaning and application of dust suppressants in London.

Due to the need to consult stakeholders and other operational practicalities, many of the policies in the Mayor's Strategy will not come fully into force until 2012 or later. This is after the extended deadline for meeting the EU limit value of 11 June 2011 or later. Consequently the Mayor's Strategy identified the need for short-term local measures to help improve local air quality at the small number of priority locations in central London most at risk of exceeding EU limit values, which included dust suppressants. The £5m Clean Air Fund, recently awarded by DfT to TfL, is allowing such measures to be implemented across central London.

Professor Kelly stated that the Fund has "largely been spent in using adhesive to stick pollutant particles to our road, which is not obviously the way forward". It should be noted that targeted cleaning and the application of dust suppressants at priority locations is just one part of the £5m Clean Air Fund. Funding is also being spent on:

- reducing idling at priority locations by using marshalling and enhanced taxi management at rail stations and through "no-idling" awareness raising;
- installing Diesel Particulate Filters (DPF's) on older buses travelling along Upper Thames Street, Marylebone Road and Park Lane;
- installing green infrastructure, such as trees, green walls and green screens; and
- working with businesses to reduce their air quality footprint, for example, by sharing deliveries with other businesses or encouraging their staff to walk to meetings.

Full details of the measures being taken to reduce levels of PM10 in central London can be found on the GLA website at:

<http://www.london.gov.uk/sites/default/files/Information%20on%20central%20London%20local%20measures%20-%20Submission%20to%20Defra.pdf>

Finally, it is heartening that in his evidence, Professor Kelly acknowledged the positive impact of the LEZ. He suggested, however, that "the turnover of the fleet has not been sufficient to have removed all polluting lorries from the road, so they must have gone somewhere else—probably in the UK and probably into the continent." Research carried out before the commencement of the LEZ showed that the vast majority of operators intended achieving compliance with the scheme's requirements by upgrading their fleets. As a result, the positive health impacts of the scheme would be as great outside London as inside the capital, as vehicles made cleaner to comply with the London LEZ travelled more widely throughout the UK and beyond. Analysis of the impacts of Phases 1 and 2 of the LEZ suggests that per-vehicle compliance rates of 95–98% are routinely achieved—which translates to almost 100% for practical purposes when exemptions are taken into account. This suggests that the expected health benefits outside London are being delivered.

I hope that this information is helpful and I would be happy to provide further information, either in written evidence or in a Committee hearing.

4 July 2011

---

---

### **Further written evidence submitted by the Chartered Institution of Water and Environmental Management and the Institute of Air Quality Management**

1. The Chartered Institution of Water and Environmental Management (CIWEM) is the leading professional and qualifying body for those who are responsible for the stewardship of environmental assets. The Institution provides independent comment, within a multi-disciplinary framework, on the wide range of issues related to water and environmental management and sustainable development.

2. The Institute of Air Quality Management (<http://www.iaqm.co.uk/index.html>) is the UK's professional body for those working in the field of air quality management. The Institute of Air Quality Management (IAQM) seeks to maintain, enhance and promote the highest standards of working practices in the field of air quality and for the professional development of those who undertake this work. It has already submitted one letter to the Inquiry.

3. At the launch of the Healthy Air Campaign on the 5 July you invited further comments on your committee's inquiry into Air quality: a follow up report. Originally the Environmental Audit Committee invited evidence by the 3 June, but since then, on the 9 June, Defra published a Consultation on Air Quality Plans to meet EU Limit Values for Nitrogen Dioxide (NO<sub>2</sub>) in England, which is relevant to your Committee's examination of whether the Government is developing an effective strategy to meet its air quality obligations under the EU Air Quality Directive. The Defra consultation consists of:

- (a) a draft UK Overview Document;
- (b) a draft List of UK and National Measures consisting of a list Air Quality Plans for the achievement of EU air quality limit values for nitrogen dioxide (NO<sub>2</sub>) in the UK;
- (c) draft air quality plans for the 30 air quality zones in England where the assessment for 2010 shows that additional time will be needed to meet in full the NO<sub>2</sub> limit values. We will refer specifically to the Air Quality Plan for the achievement of EU air quality limit values for nitrogen dioxide (NO<sub>2</sub>) in the Greater London Urban Area (UK0001); and
- (d) a draft Technical Report describing the methods used to assess the air quality plans for 2015 and other future years. This relies essentially on estimates of emissions for a zone and surrounding regions, a model (a mathematical method or procedure for doing calculations) to estimate concentrations in the zone and comparisons between the model and past observations to check on the model's performance i.e. that it can be used to estimate future concentrations. These are the three essential components of air quality management. This document, in its second paragraph, states that it should be read alongside the separate UK overview document, the list of UK and National Measures and the air quality plans for each of the 40 UK zones included in the notification. This is an almost impossible task for any individual, as no clear attempt has been made to explain methods and general conclusions.

4. Because of the concerns that we have over this approach, we are submitting further evidence to your Committee.

5. Table 3 of Defra's draft Overview report shows that compliance will not be achieved in 17 zones (under a Low Emissions Zone scenario) or 21 zones (under a baseline scenario) by the attainment date of 2015, although as stated in paragraph X of the overview document, Article 22 of the 2008 Directive allows Member States to apply to postpone the attainment date for the NO<sub>2</sub> limit values from 2010 up to 2015, subject to submission to the Commission of air quality plans setting out how the limits will be met by the extended deadline. It is not entirely clear why Defra is applying for a postponement when one of the conditions for applying for a postponement is that plans should be submitted to show how the limits will be met, which clearly they will not be.

6. The Overview report also makes the point that NO<sub>x</sub> emissions from road transport have not followed projections for various reasons, and are therefore subject to uncertainty regarded past conditions and uncertainty when projected forward in time to 2015, and to 2020 and 2025, as discussed in the draft Overview report. Although Defra recognise the uncertainty in road transport emissions, this uncertainty is not taken into account in the projections. The uncertainty arises from problems with emission factors and assumptions in emission inventories relating to diesel vehicles, accentuated by the high fraction of diesel cars in new registrations in recent years. These problems have become apparent from trends in roadside measurements in recent years.

7. This uncertainty undermines the basis of the modelling used to project forward to future years. It is unsatisfactory to continue to use existing road transport emission factors, just because "nothing else is available". Instead an attempt should be made to apply "inverse modelling" techniques, often referred to as assimilation methods, to correct emission factors. Some so called "tuning" is a feature of the current modelling, but no systematic attempt has been made to adjust emission trends in the projections presented and this invalidates the method used.

8. In addition the interested reader is subject to a paper chase to understand how the assessment has been undertaken. Model projections should be readily understood by any interested reader, if presented clearly in a plain common sense way, showing why projections behave as they do, and need not be shrouded in complications. This is part of what is called "diagnostic" evaluation of a model. This provides a useful check and an alternative to the blind acceptance of the results of a model calculation. It is one way to explain the

**Ev w56** Environmental Audit Committee: Evidence

---

reasons for differences in models. Defra can call upon experts to review the quality of their technical analysis, and given the importance of this one should have done so on this occasion.

9. The report contains no general approach as to how national and local measures will be used to achieve NO<sub>2</sub> limit values. A strategic view of air quality management based on evidence from the past two decades should have been presented with Defra providing leadership. We therefore consider that Defra has failed to develop an effective strategy to meet its air quality obligations.

10. Further technical issues are listed below.

11. It is stated in the Technical Report that it is not possible to calculate an unambiguous source apportionment for annual mean NO<sub>2</sub> concentrations. Source apportionment, if possible, would show how much each sector e.g. cars, buses taxis *etc.*, contributes to the total concentration at a specified location and is a key step in defining what is the appropriate air quality management measure. However such a source apportionment for NO<sub>2</sub> is undertaken for the road link with the highest concentration in Table 12 and elsewhere in the Air Quality Plan for the Greater London Urban Area (UK0001), one of the air quality plans to be read alongside the overview document. This is directly contradictory. One cannot know that the complete removal of one source sector, such as buses, will reduce NO<sub>2</sub> concentrations by 78.6 in 2015, as shown in Table 9 of the UK001 plan, because of the complex relation between NO<sub>x</sub> and NO<sub>2</sub>.

12. One can undertake source apportionment for NO<sub>x</sub> and this is shown at many locations in Annex 1 to this plan. It appears from Table 9 that nearly three quarters of the NO<sub>x</sub> is from buses at the road link in Greater London with the highest concentrations. However this does not mean that cleaning buses will remove the annual NO<sub>2</sub> exceedance in the whole of the UK0001 zone. In other words this site is not representative of all zones in London where the air quality limit value for NO<sub>2</sub> is predicted to be exceeded in 2015.

13. The Air Quality Plan for Greater London is one of the 40 UK air quality plans and contains information about measures which could affect NO<sub>x</sub> emissions within the Greater London zone. However no attempt is made to assess quantitatively the effectiveness of local and national measures within this Action Plan. This means that it is not possible to assess which measures are likely to be effective. With 30 Air Quality Plans contributing to reductions in NO<sub>x</sub> and NO<sub>2</sub> within England, it is not possible for interested parties to see which measures are likely to be the most effective. Such an analysis is one of the main reasons why one undertakes modelling. (The other is to make future projections.) It allows the decision maker to consider a variety of scenarios and on this occasion is an important opportunity missed.

14. To understand the technical report one has to go to a further technical report (UK air quality modelling for annual reporting 2008 on ambient air quality assessment under Council Directives 96/62/EC, 1999/30/EC and 2000/69/EC [http://uk-air.defra.gov.uk/reports/cat09/1101250943\\_dd122008mapsrep\\_v4.pdf](http://uk-air.defra.gov.uk/reports/cat09/1101250943_dd122008mapsrep_v4.pdf)). In this report the relationship between NO<sub>2</sub> and NO<sub>x</sub> is assumed to depend on an empirical relationship which may not apply in the future. Complexity is further increased because the fraction of primary NO<sub>2</sub> emissions varies from one location to another. Thus the NO<sub>2</sub> to NO<sub>x</sub> relationship varies in different locations. The relationship between NO<sub>2</sub> and NO<sub>x</sub> assumes that oxidant levels will stay the same in future years out to 2025, based on a paper published in 2006, which uses observations up to 2003 and a global model to extrapolate to the future. In addition Fig 3.21 of this technical report shows clearly that the model's prediction of roadside concentrations is subject to considerable scatter possibly by as much as plus or minus 30%, suggesting that error bounds should be placed on any projections which are used for assessment. These should be presented in the draft Technical Report and Overview Report, which at present contain no indication of the accuracy of the estimates which have been made.

19 July 2011

---