



'One Atmosphere'

Getting Clean Air in Cities

By Simon Birkett
Founder and Director
Clean Air in London
Twitter: @CleanAirLondon

Getting 'Clean Air in Cities'

1. Getting started
2. Background and context
3. Situation now
4. Social media
5. Getting liveable cities
6. UNEP's GEO-6
7. Next steps
8. Opportunity

1. Getting started

- Starting 'Clean Air in London'
- Mission
- Three principles
- Building media and public understanding
- Milestones and successes

Starting 'Clean Air in London'

- Campaigning locally. Entity and governance
- Mission. Objectives: health, London-wide. Highly political but non-party. 'Wholesale' not 'retail'
- Principles: London Matrix, Principle and Circles
- Strategy? Focus on air quality in London and 'up'
- How? Content and communications
- It's fun! Engage others. Share knowledge. Sustainable




Mission

“To achieve urgently and sustainably full compliance with World Health Organisation guidelines for air quality throughout London and elsewhere”

The London Matrix – ‘One Atmosphere’

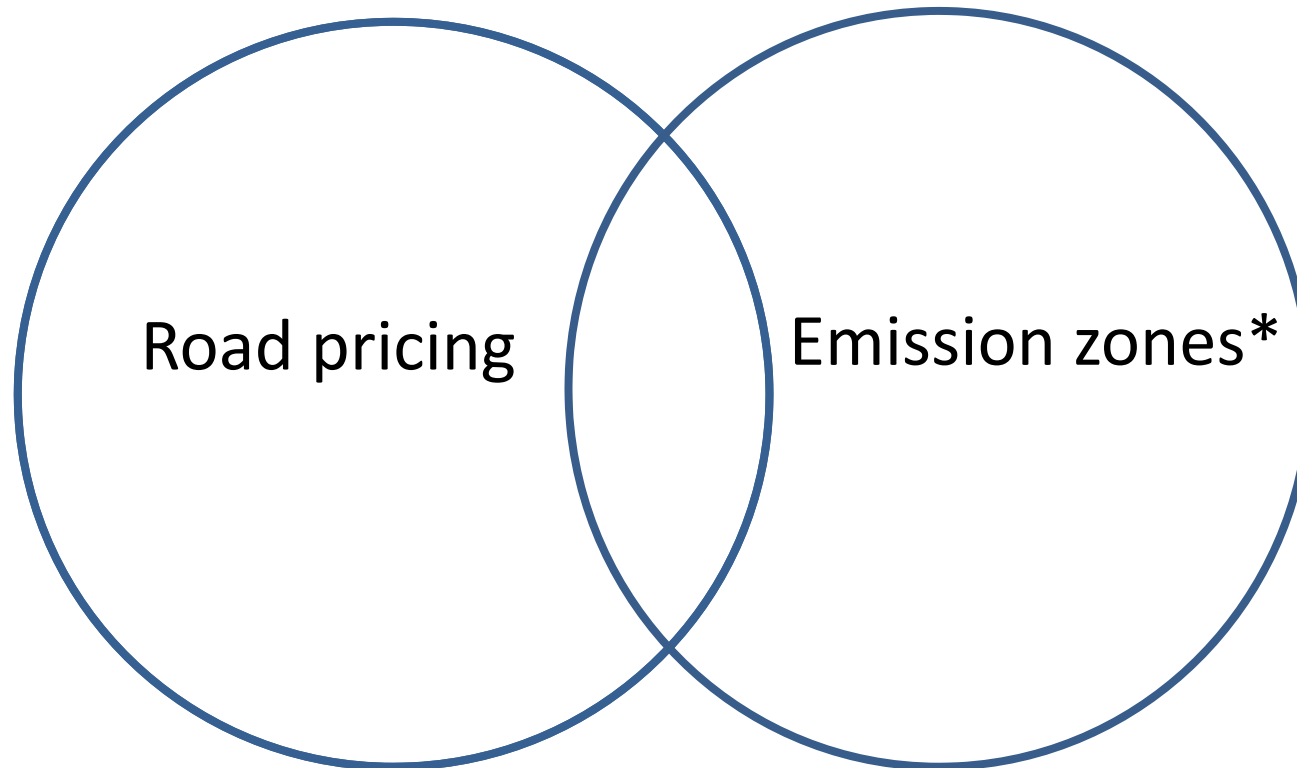
	Air pollution	Climate change
London		
Rest of world		

The London Matrix – ‘One Atmosphere’

	Air pollution	Climate change
London	Success	
Rest of world		

The London Circles

Transport measures address congestion and/or emissions



* 'Clean Air Zones'

The London Principle – ‘One Atmosphere’

We must think in terms of ‘One Atmosphere’. All obligations to reduce air pollution must be met. Any trade-offs between climate change and air quality should be made in an explicit and transparent way e.g. through the application of the ‘London Principle’. This states that a 1% disbenefit in climate change terms (e.g. increased CO₂ emissions) should be accepted when there is an associated benefit of 10% in air quality terms (e.g. reduced emissions of particulate matter or oxides of nitrogen) (and vice versa) provided that legal breaches are not worsened

Media coverage: Oxford Street



Examples of media coverage

ABC Al Jazeera Ars Technica BBC Bloomberg Boston
Globe Business Green CBS Channel 4 China Central
Television China Radio International CNN DW Eco dalle
Citta El Pais ENDS Euronews Evening Standard Express
Financial Times France 24 Gibraltar Chronicle Guardian
The Hill Independent ITV LBC London Live Mail Metro
Mirror New York Times Observer Oriental Morning Post
Radio France International Reuters RT Saturday Paper
Le Soir Sky Southern Weekly Sun Svenska Dagbladet
Sydney Morning Herald Telegraph Time Time Out Times
Vice Voice of Russia Yellow Advertiser ZDF

Building public understanding

Easier to warn the general public than...



Survey of 100 Members of Parliament

...politicians

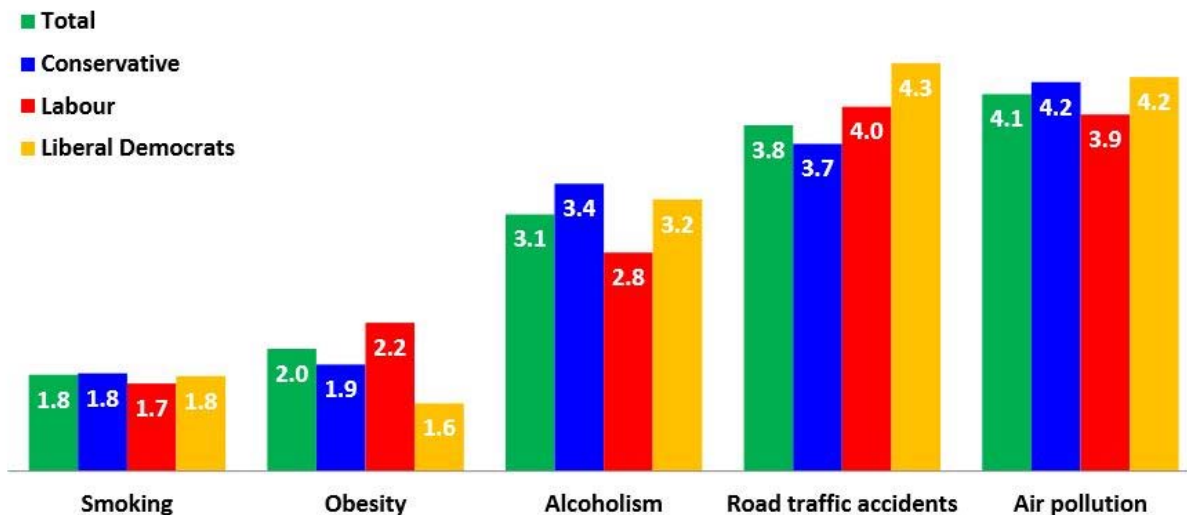
Rank the following risk factors in terms of the number of early deaths attributable to them in the UK annually:

1. Smoking
2. Obesity
3. Alcoholism
4. Road traffic deaths
5. Air pollution

Rank 1 is for the greatest number of deaths and 5 is for the lowest number

DODs Parliamentary survey ...politicians

Average rankings 2014

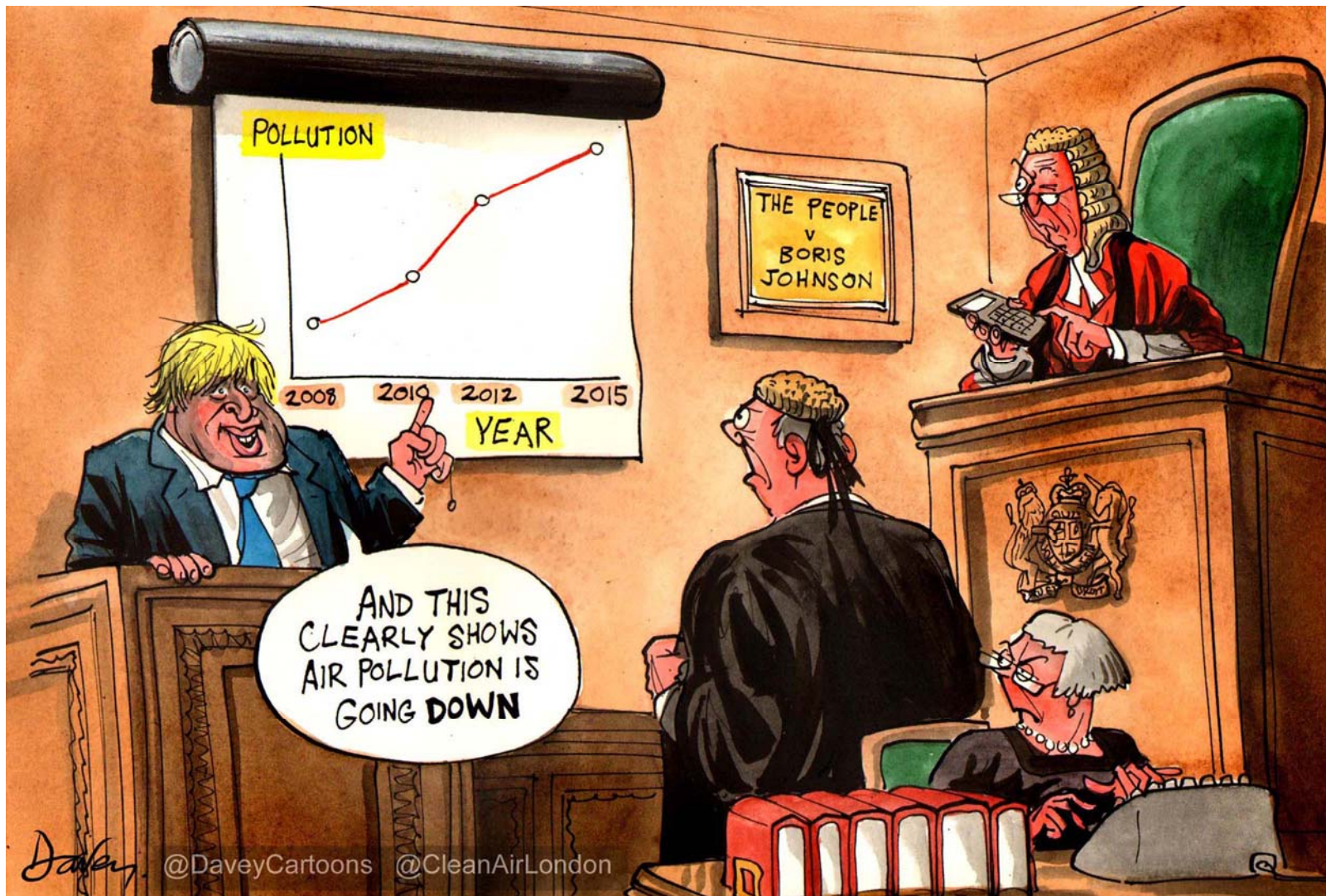


Rank the following risk factors in terms of the number of early deaths attributable to them in the UK annually (rank 1 is for the greatest number of deaths; and 5 is for the lowest number). Base 100, weighted by party



Milestones and successes

- **2006-2008** Getting started. Media coverage. New Air Quality Directive for Europe
- **2008-2010** Health investigations. Solutions proposed
- **2010-2012** Olympics and legal pressure. European Commission infraction twice on PM₁₀. Many others begin campaigning. Parliamentary inquiries
- **2012-2015** Breakout. European Commission's 'Clean Air Policy Package' in December 2013 and keeping it in early 2015. Role of social media, cartoons etc. NO₂ infraction
- Three sponsors: Camfil (indoor air quality), New West End Company (Oxford Street businesses) and Licensed Taxi Drivers Association (distributing taxi receipts)
- **2015-2020** 'One Atmosphere'. UNEP role



2. Background and context

- Jargon
- Historical perspective
- 'Pollution Suppressor'
- Lessons

Jargon

- Particles (PM_{2.5} and PM₁₀) and gases (NO₂)
- Short (e.g. PM₁₀) and long-term (e.g. PM_{2.5}) health effects. Mortality and morbidity. Overlapping effects
- Emissions and concentrations. Health exposures, impacts and outcomes. Visible and invisible
- All affected. Many outcomes. Deaths mainly cardiovascular. 4,300 PM_{2.5}. 5,900 NO₂ in London versus 8,500 from smoking. Second biggest public health risk
- Local (NO₂), regional (PM_{2.5}) and transboundary pollution e.g. tropospheric ozone (O₃)

Historical perspective

- Great Smog 1952 and Clean Air Act 1956
- Scientific focus on short-term respiratory effects despite evidence of cardiovascular deaths in 'time series' studies
- 'Cohort studies' identified long-term effects of PM_{2.5}
- Myopic focus in UK since 1990 on CO₂ and fuel efficiency
- Many roads in Central London tend (today) to have the highest NO₂ concentrations in the world. Blame diesel
- Europe Union's 'Clean Air Policy Package' in 2013
- 68th World Health Assembly. First debate on air pollution!
- Back where we thought we were 60 years ago

Myopic focus on CO₂

*A very senior civil servant, now retired, who worked in the [Department of Environment in the late 1990s] and has asked not to be named, said that cost-benefit studies of a switch to diesel were done, but climate change was “the new kid on the block” and long-term projections of comparative technologies were not perfect. “I recall all the discussions had the health issue as a significant factor,” he says. “We did not sleepwalk into this. **To be totally reductionist, you are talking about killing people today rather than saving lives tomorrow.** Occasionally, we had to say we were living in a different political world and everyone had to swallow hard.”*

John Vidal, Environment Editor, in The Guardian, 20 June 2015

Myopic focus on CO₂

“The Chairman, summing up the discussion, concluded that the points could be put to Ministers in a general way. It was important, however, not to allow the question of fiscal incentives to encourage the purchase of cars meeting lower emission standards than the mandatory ones to obscure the long-term need to encourage people to use fuel efficient [diesel] vehicles.”

Department of Transport

Minute of meeting on 28 September 1990

London: 15 March 2012



Pollution Suppressor – 26 March 2012



London: 19 February 2013

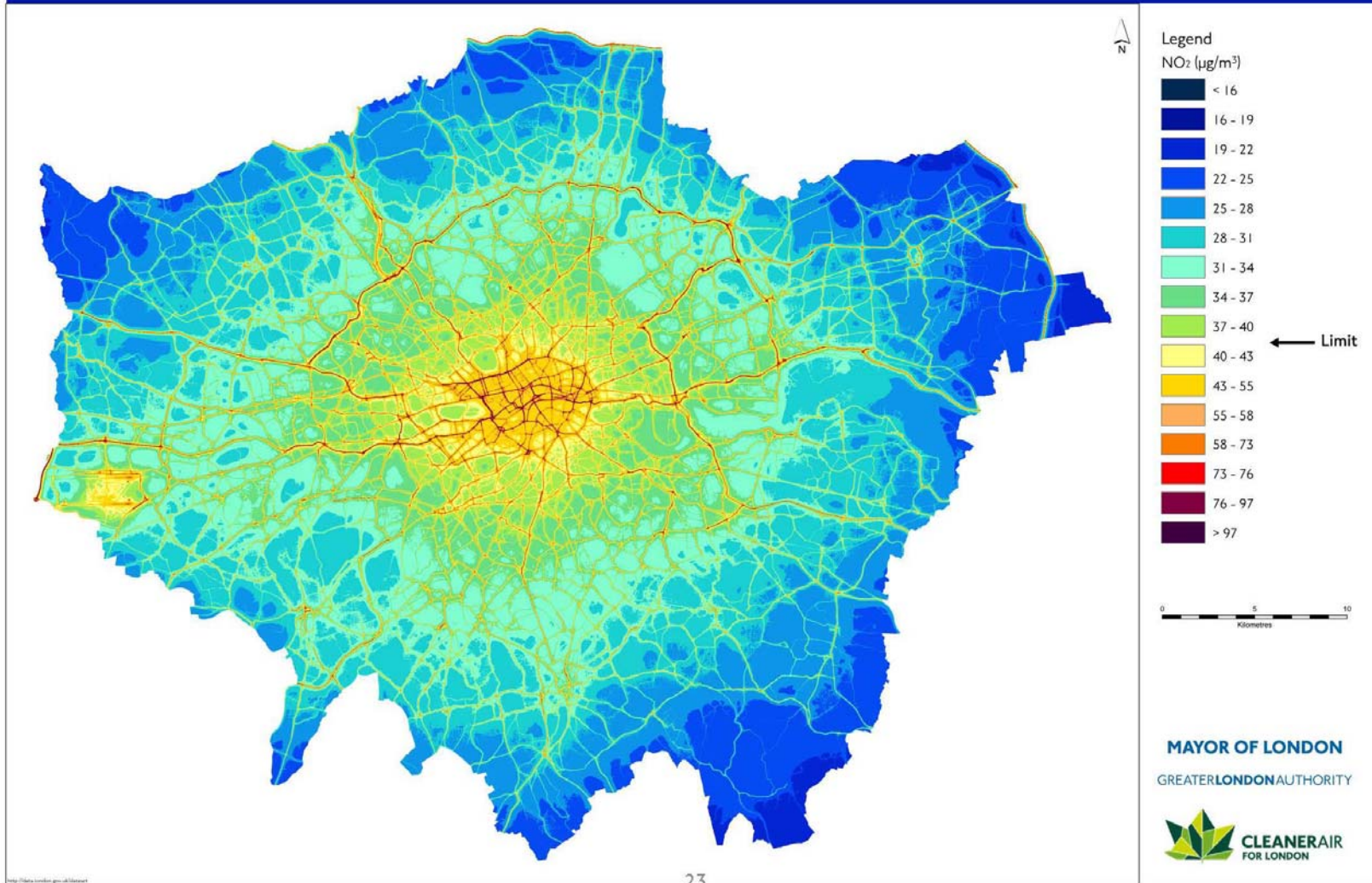


Lessons

- ‘One Atmosphere’: air pollution and greenhouse gases. Policy disasters promoting diesel and biomass burning
- Government departments are not/never ‘joined-up’. Must maintain and build scientific and official expertise
- Short and long-term effects e.g. offsetting. NO_x/O₃. SO_x cooling effects from shipping. Black carbon. CH₄. Hg. NH₃
- Solutions: Governance. Political leadership, lifestyle changes and technology. Not just ‘Best available technical solutions’. Offsetting is never the answer. Green walls cost 40x exhaust abatement per kg of pollutant removed
- Indoor air quality: ventilation, air conditioning and filtration
- Communicate health impacts. Warn, protect and reduce
- Expect new health and natural environment impacts

3. Situation now

- Health
- Legal
- Sources
- Solutions



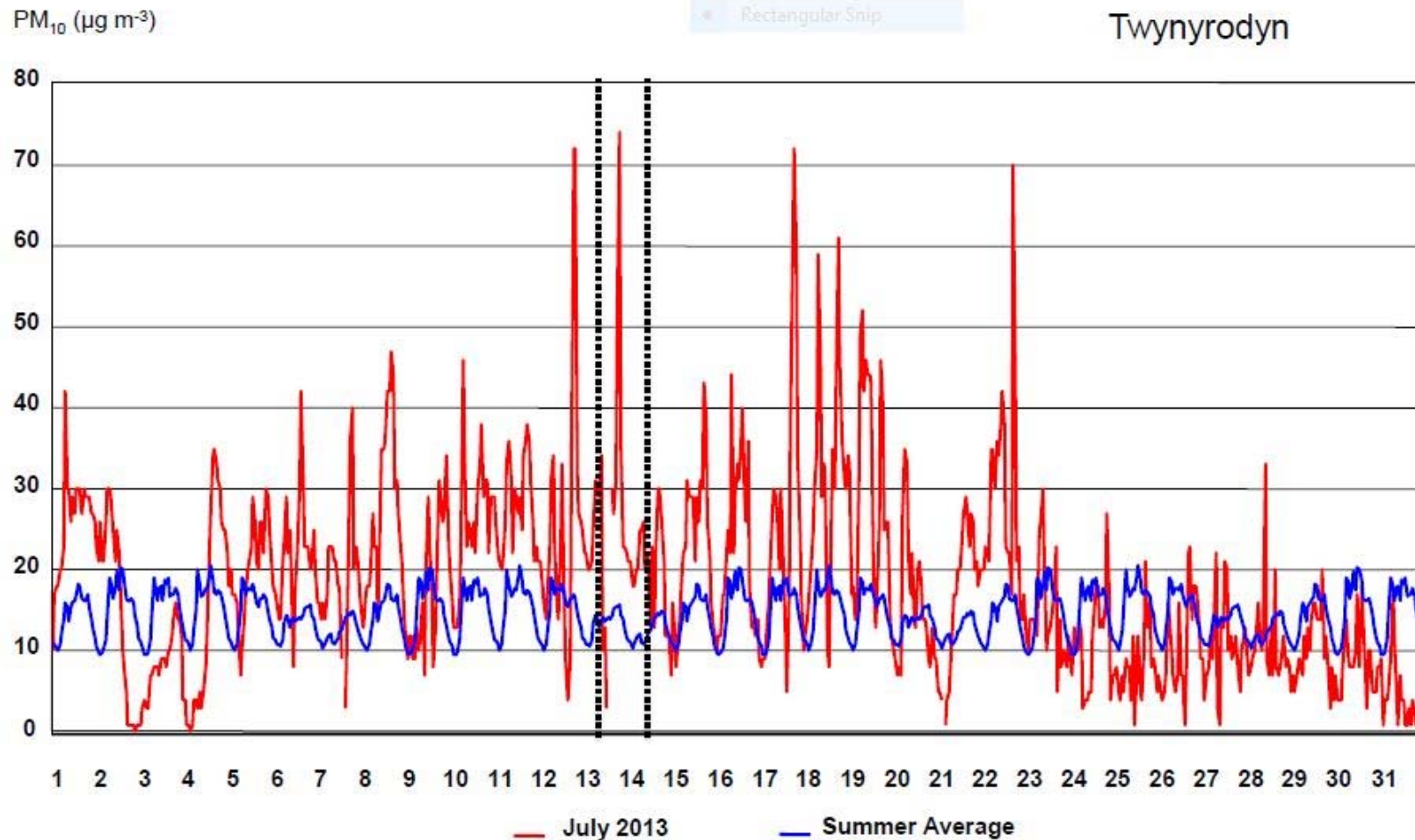
Health

- Excellent REVIHAAP and HRAPIE reports by WHO
- Statistical versus actual impacts
- PM_{2.5}. Health effects detectable well below 10 µg/m³
- NO₂ – London study based on WHO's HRAPIE
- Traffic-related air pollution (TRAP)
- Cognitive effects on children. Jordi Sunyer et al
- Inequalities
- Emerging problems: PM_{2.5}! NO₂, TRAP, ozone and nanoparticles. More pollutants and more outcomes

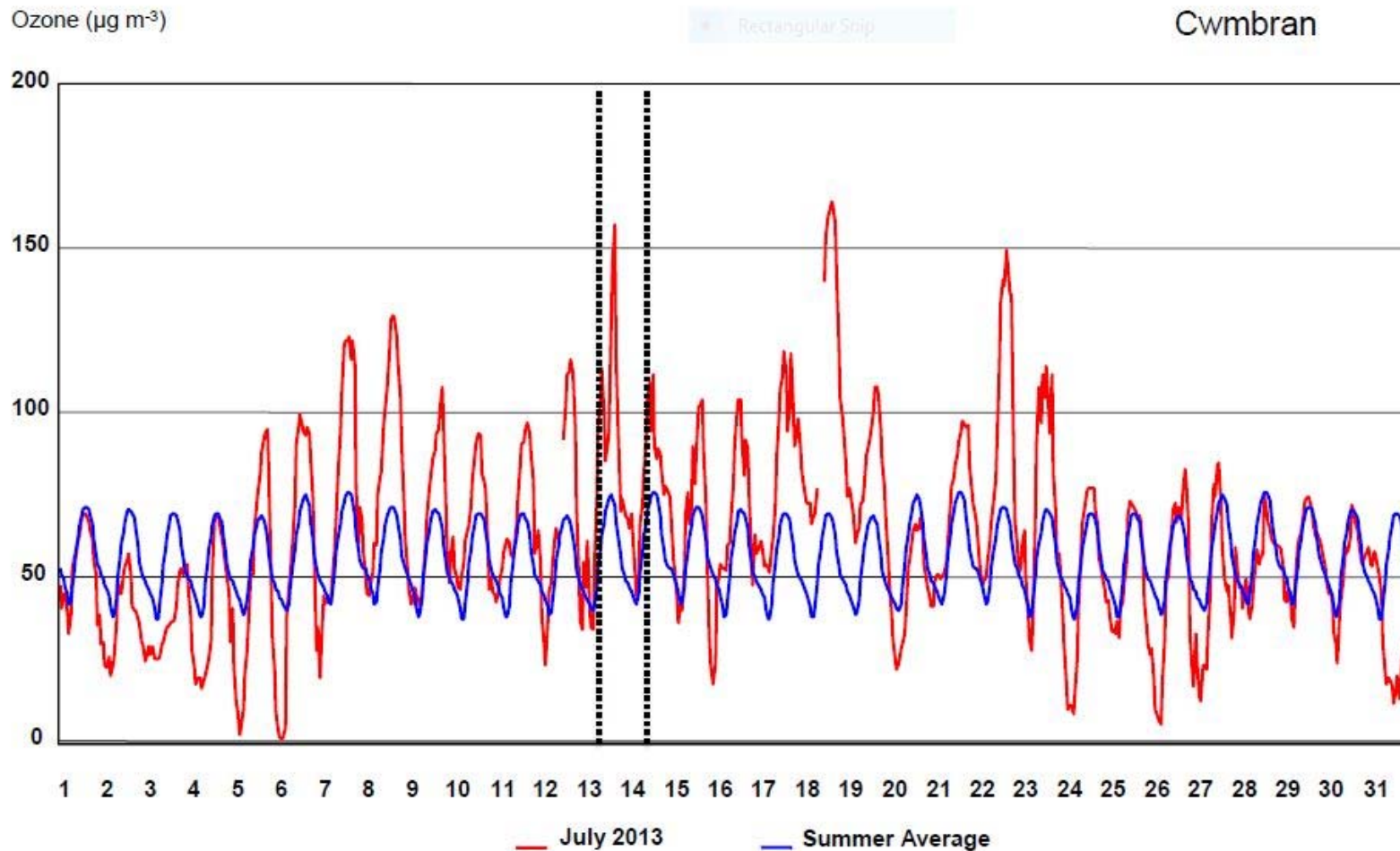
World Health Organisation declares...



Tragic deaths during SAS selection in 2013



Tragic deaths during SAS selection in 2013



Legal – London and Europe

- Governance e.g. Freedom of Information
- Tiers
 - European infraction
 - National courts. ClientEarth's wins have implications across Europe. Government's NO₂ plans 'pass the buck'
 - Planning decisions. Authoritative QC opinion
- Need new Clean Air Act to address modern fuels and technologies
- New laws in Europe e.g. National Emissions Ceilings Directive to target sources. NRMM
- Brexit? Heathrow expansion?

ClientEarth wins

Supreme Court in 2015. High Court in November 2016



Sources – London and Europe

- Be sure to identify them. Many pollutants
- PM, NO₂, NO_x and O₃. Black carbon, CH₄, NH₃, SO_x and VOCs. Indoor and outdoor
- City (24% PM_{2.5} but 82% NO₂) versus background
- Importance of agriculture, construction, industry, power generation and shipping
- Gas heating and cooking. Illegal wood burning
- Road transport in cities. #DieselGate. New Euro 6 standards failing. Tyre and brake wear
- Air pollution episodes e.g. Sahara dust?

Solutions – General principles

- Build public understanding. Warn people and give them advice on protecting themselves (adaptation) and reducing pollution for themselves and others (mitigation)
- Political leadership. Need action in cities and outside them
- Hierarchy of solutions simultaneously and in parallel
 - Governance e.g. access to information and justice
 - Lifestyle changes e.g. active travel
 - Ban or close the most polluting activities e.g. no biomass burning within the gas grid
 - Short-term technology solutions e.g. retrofit
 - Long-term technology solutions e.g. electric, renewables
- What policies? Everything including the kitchen sink
- China knows how to do it e.g. Olympics 2008. 2015. 2022?

Zero tailpipe emissions by 2020

Source: Transport for London



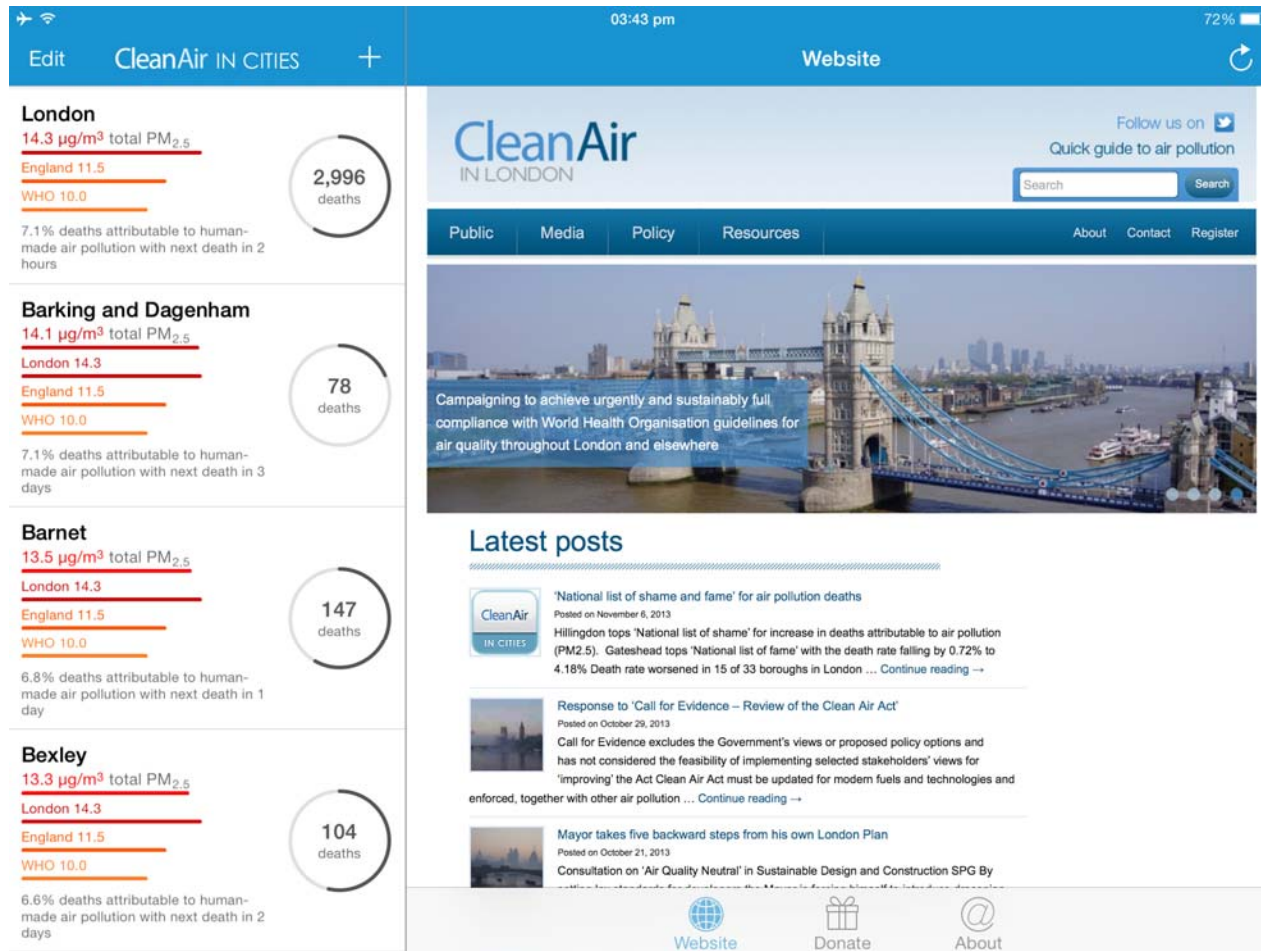
4. Social media

- Twitter and Facebook
- Apps
- Cost effectiveness
- Big 'hits'

Social media and technology

- Website. Twitter versus Facebook. Analytics
- 30,000 Twitter followers – global audience. 50,000 Facebook fans – London audience. Cost effective and powerful. No-one knows how far or fast a tweet or post will spread. Transparent. Viral
- Twitter: images, links, hashtags and usernames. Top tips: mutual respect and account security. Lists. First EMEA Twitter success story was about us
- Apps. Viral. Repetition. Momentum
- Reaching anyone, anywhere. Everyone, everywhere

'Birkett Index' – 'Clean Air in Cities' app



Big 'hits'

- 1,100 schools within 150 metres of busy roads
- 60th anniversary of the 'Great Smog'
- Diesel emissions on 41,700 road links in London
- Top 50 most-polluted. Buckingham Palace!
- ClientEarth's legal wins. Infraction action
- Ranking of top 10 death 'outcomes' in London
- Air pollution episodes e.g. 'Sahara Dust'

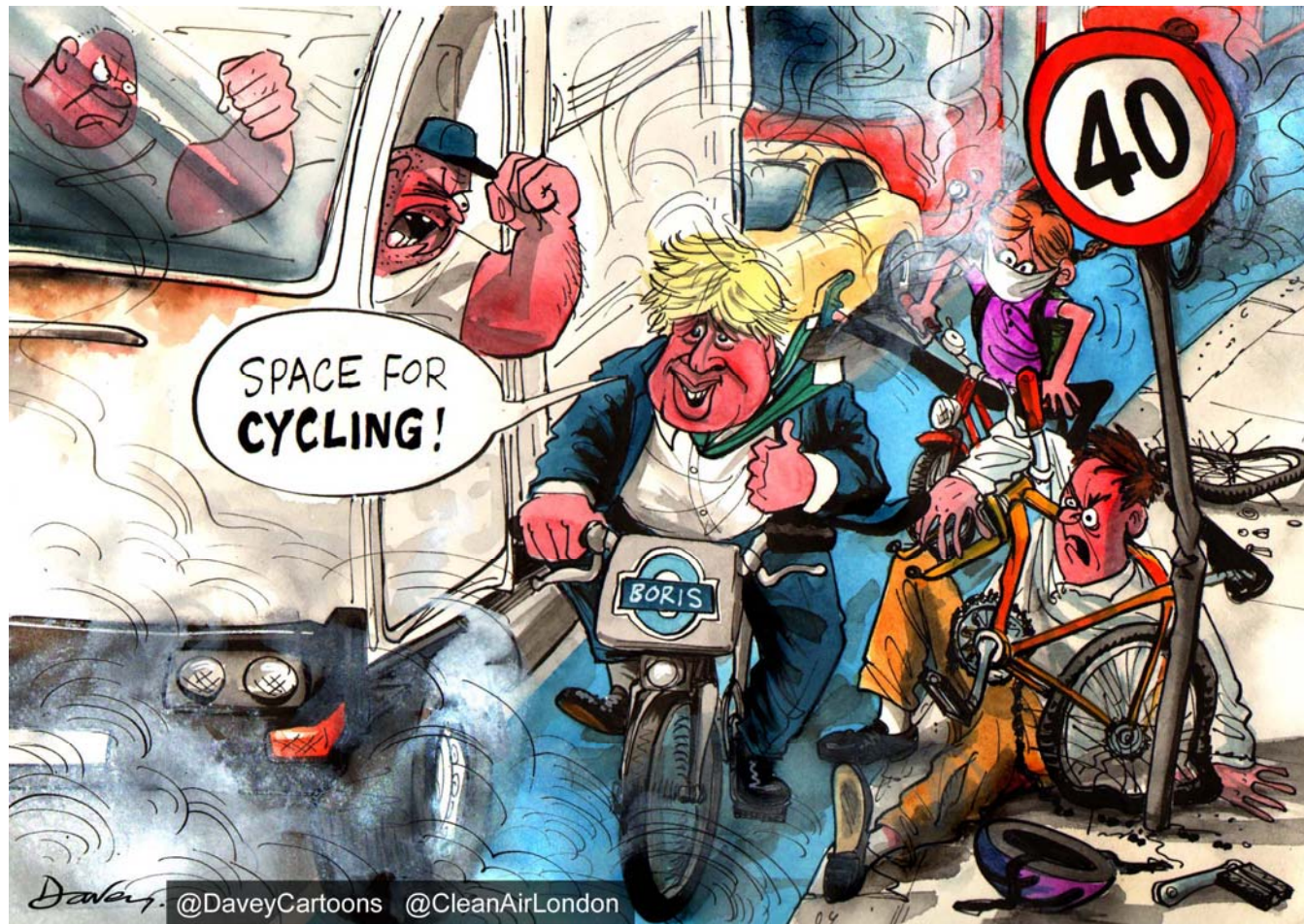
5. Getting liveable cities

- London and other mega cities
- 'Ultra low' emission zone in 2020
- Indoor air quality matters (a lot!)

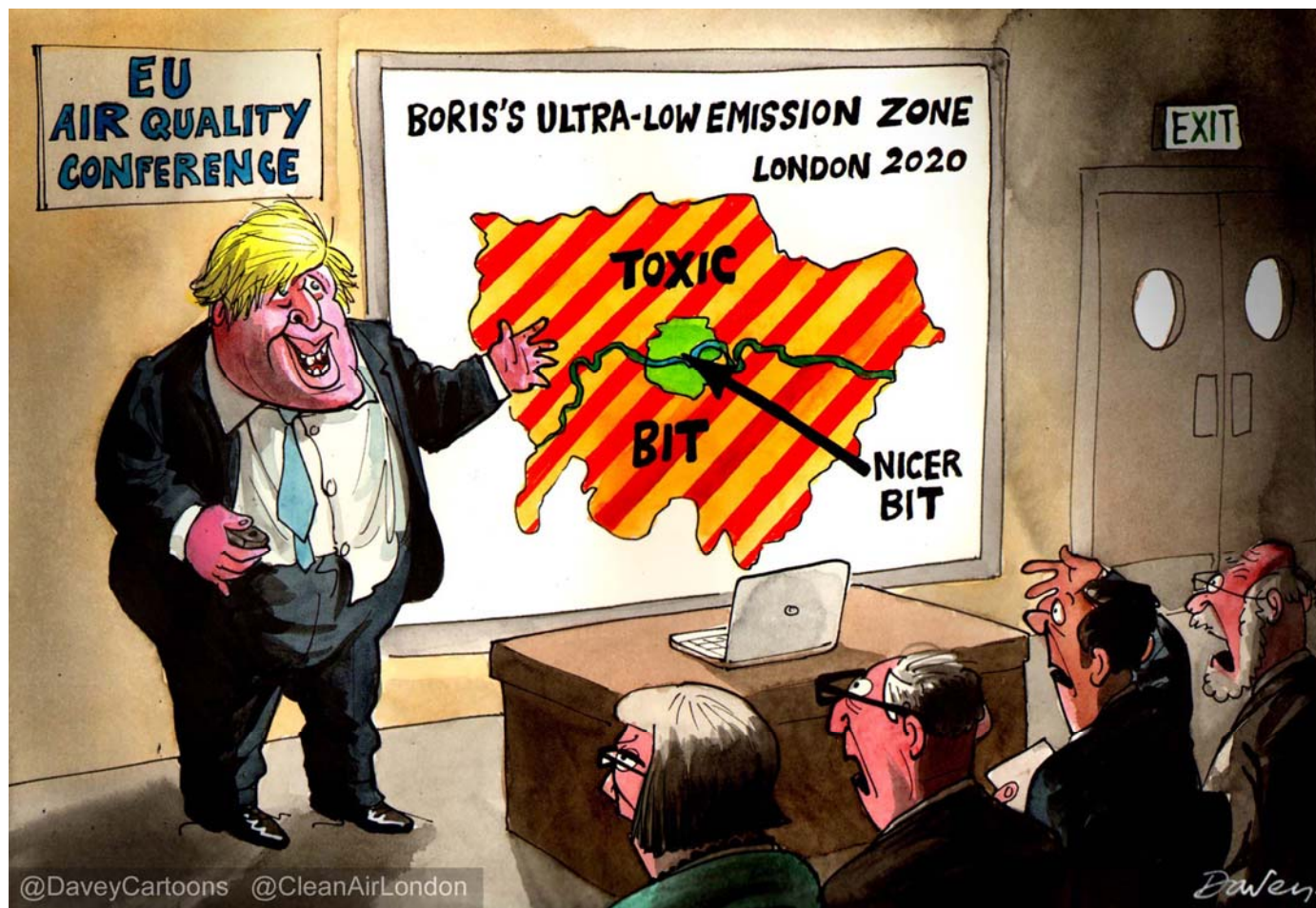
London and mega city solutions

- Build public understanding of air pollution. Smog warnings. Public health agencies must protect people
- Act on illegal wood burning: 5-10% annual mean PM₁₀
- Think 'One Atmosphere' on local energy generation e.g. stop standby diesel generators feeding into the 'grid'
- Energy: Efficiency. Zero air emissions. Renewables. Onsite
- Ban diesel, diesel, diesel as we banned coal
- Bus and taxi emissions (scrapping 25ft turning circle)
- Use 'geo-fencing' with care. Restrict road building
- Promote positive measures e.g. active travel and car-free centres. Restrict polluting activities e.g. ultra low emission zones and/or emissions based road charging

Encourage active travel



Ultra-low emission zone in 2020



Indoor air quality matters (a lot!)

New standard ISO 16890

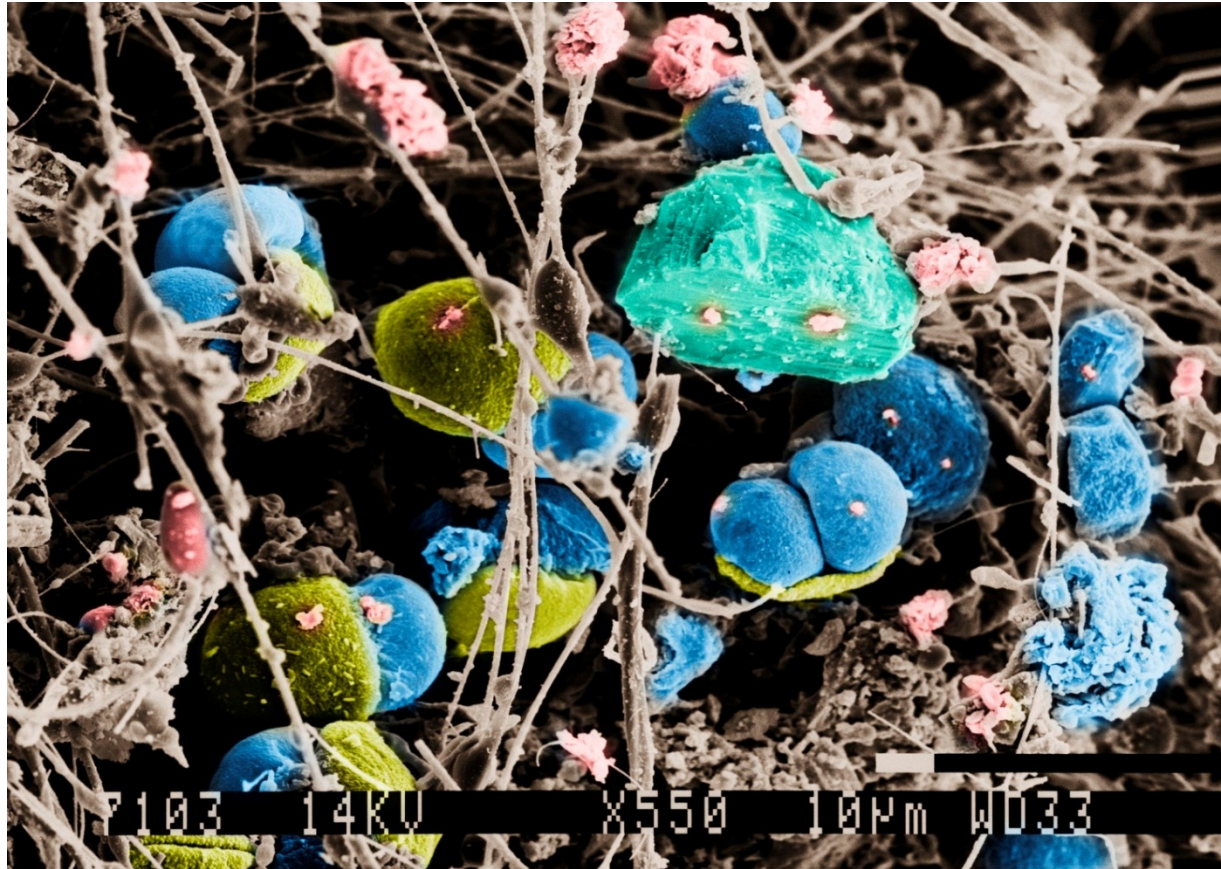
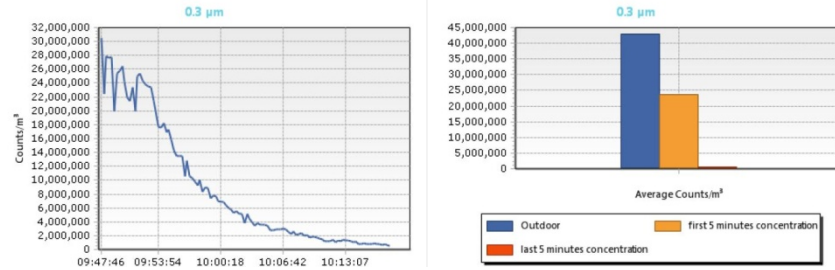


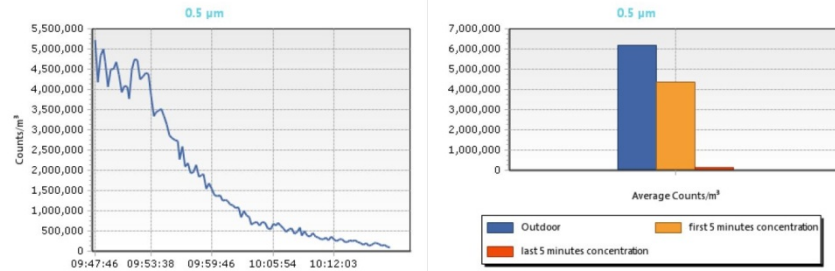
Photo: Lennart Nilsson

Proof of Concept Measurement

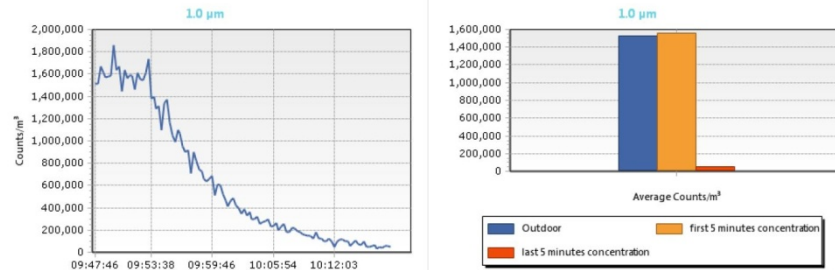
0.3 μm : 97% Improvement



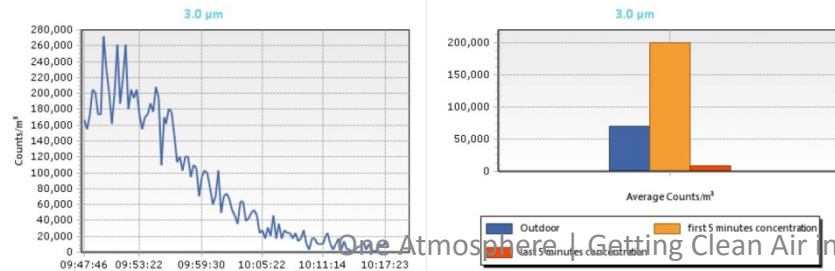
0.5 μm : 97% Improvement



1.0 μm : 97% Improvement



3.0 μm : 96% Improvement

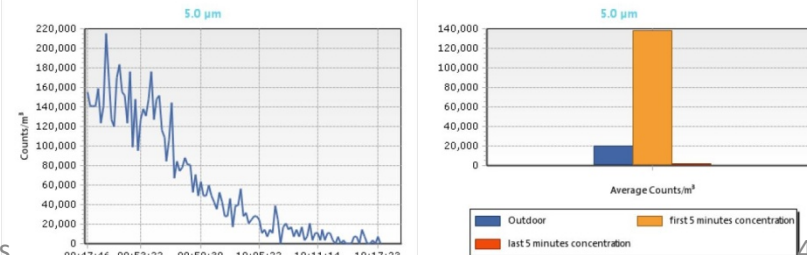


Home office test – City S unit
Over 25 minutes
Range 0.3 to 5 microns

97% - 98%
Particle number
reduction



5.0 μm : 98% Improvement



Global solutions

- PM_{2.5}: Replace coal and wood burning with solar, hydro, tidal and wind. Energy saving
- Action on agriculture, rail and shipping e.g. NOx Emission Control Areas for shipping
- Local energy generation. Reduce emissions from CHP, medium-sized combustion plant, incinerators etc.
- NO₂: road transport and diesel. Retrofit ST. LT solutions
- Ban diesel, diesel, diesel. Non-road mobile machinery
- Promote positive measures e.g. active travel and car-free centres. Restrict polluting activities e.g. ultra low emission zones and emissions based road charging

6. UNEP's GEO-6

- Sixth Global Environment Outlook
- Key issues
- Global air pollution issues
- Next steps towards 2018

Sixth Global Environment Outlook



HLG – Nairobi. 26-27 March 2015



GEO-6: Overview and key issues

- State and trends of air, land, water and biota
- Policies
- Outlook
- Regional issues so far
- My two headline priorities
 - ‘One Atmosphere’. Short and long-term effects e.g. offsetting pollutants and health impacts
 - Policy hierarchy must start with governance and include lifestyle changes and banning or closing the worst polluters before relying on technology
- Emerging concerns. New PM_{2.5} risks. NO₂, nanoparticles, TRAP and ozone

GEO-6: Global air pollution issues

- Africa: Environmental governance. Data revolution
- Asia: Sustainability. Transboundary issues e.g. air pollution. Environmental governance. Urbanisation e.g. transport
- West Asia: Sustainable cities and air quality linked to transport. Increasing use of social media. Fracking
- Europe: Green economy. Air quality. Climate change. Nanoparticles. Low public awareness (still). Coal
- North America: Nanoparticles. NH_3 emissions increasing (agriculture/fertiliser). Fracking. New metrics for GDP. Innovation in media and engagement tools
- South America: Citizen science. Governance – rights and responsibilities. Fracking

7. Next steps

- Internationally
- ‘Clean Air in London’

International next steps

- Paris Agreement
- Sustainable Development Goals for 2020 and 2030
 - **Goal 3. Ensure healthy lives and promote well-being for all at all ages**
 - 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination
 - **Goal 11. Make cities inclusive, safe, resilient and sustainable**
 - 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
 - **Goal 12. Ensure sustainable consumption and production patterns**
 - 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil to order to minimize their adverse impacts on human health and the environment
 - **Goal 13. Take urgent action to combat climate change and its impacts**
 - 13.2 Integrate climate change measures into national policies, strategies and planning
 - 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
- European legislation on sources and enforcement of air quality laws
- UNEP's GEO-6 at UNEA 2, UNEA 3 and UNEA 4 in 2019
- World Health Assembly approved WHO's Clean Air plan in May 2016

'Under the Dome'



Part 7 of 8 "Under The Dome" Documentary on China's Pollution by Chai Jing

Next steps for 'Clean Air in London'

- New Mayor. Top three issue with housing and...? Mayor's risk is on the 'upside' not 'downside'
- New Clean Air revolution 60 years after the last
- Update Clean Air Act for modern fuels and technologies
- Role of EU law after Soft or Hard Brexit?
- Vision: save London, save the world. Break the cycle of air pollution by eliminating emissions at source

8. Opportunity

Next five years – ‘One Atmosphere’

- 5 July 2016 was 60th anniversary of first Clean Air Act
- Focus to 2020 and beyond on ‘One Atmosphere’
- Encourage people to think holistically about local air pollution and greenhouse gases
- Show the world how to tackle local air pollution and achieve wider climate and sustainability objectives
- Wonderful opportunity

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With special thanks to:

Clean Air Society of Australia and New Zealand casanz.org.au

VicRoads vicroads.vic.gov.au

Jay Hunt of Violet Productions violetproductions.com

Ryan Blair, Cameraman ryanblair.com.au

Richard Potts of Ace Post Production acepostproduction.co.uk

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