



Ricardo
Energy & Environment

Local Air Quality Management

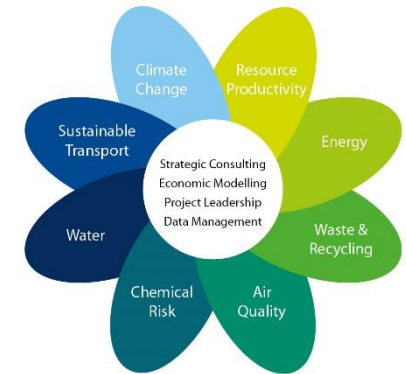
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24th November 2016

Local Air Quality Management

Outline of presentation:

- Introduction
- Air Quality Objectives
- Local Air Quality Management
 - Sussex perspective

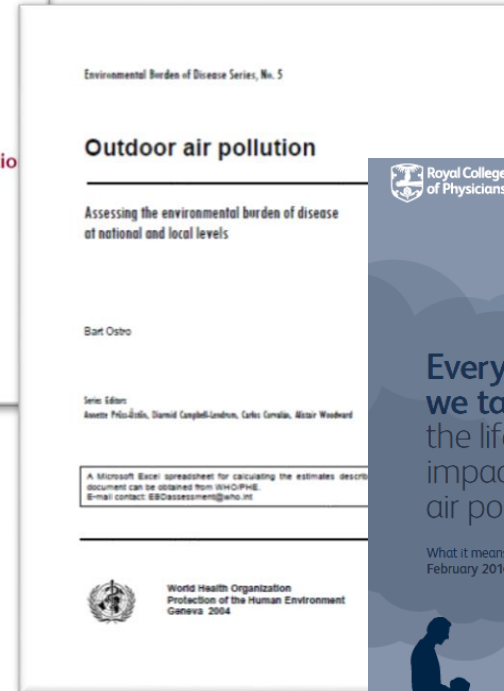
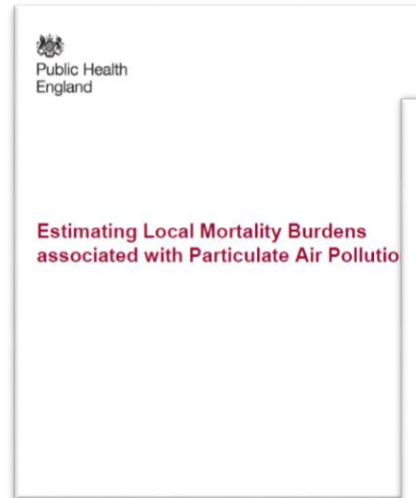
- Internationally-renowned consultancy
- Heritage of world-leading scientific/technical capability
- Providing analysis and solutions for major environmental challenges
- Client base of international governments and businesses
- Headquartered at Harwell Science Park, near Oxford
- Over 450 scientists and technical staff
- Part of Ricardo PLC – Head office in Shoreham, West Sussex.



Air Quality Objectives

Evidence and research

- Air pollution ranked UK's second biggest public health risk:
 - Smoking 87,000 (2007)
 - Air pollution 40,000 (2008)
 - Obesity 9,000 (2007)
 - Road accidents 2,200 (2009)
- ~40,000 people (prematurely) die across UK ($PM_{2.5} + NO_2$)
- Most vulnerable groups on front line are people with: COPD, asthma, cardio-vascular disease, older people and the very young.



Evidence base is growing:

- COMEAP (various)
- Public Health England (2014)
- World Health Organisation (2016)
- Royal College of Physicians (2016)
- National Institute for Health and Care Excellence (2017)

Pollution incidents

Winter-time fogs still occur when high pollutant concentrations become trapped under a natural temperature inversion.

- Pollutants: NO_2 SO_2 PM_{10} from transport, industry and heating sources.

Summer-time incidents also occur when local met. conditions contribute to the creation of high ground level ozone (O_3) concentrations.

- In addition O_3 can be transported in from other regions via transboundary air movements (such as Europe).
- Ozone (O_3) formation occurs via the photo-chemical conversion of primary pollutants such as NO_x , NO_2 & VOC's, which react in sunlight to create ozone.

Research in Sussex identified that between 2006 – 2011 estimated that around 740 – 760 respiratory hospital admissions in Sussex were caused by air pollution (King's College London Environmental Research Group – 2013 <http://www.sussex-air.net/reports/ASPIREreportKingsfinal.pdf>)



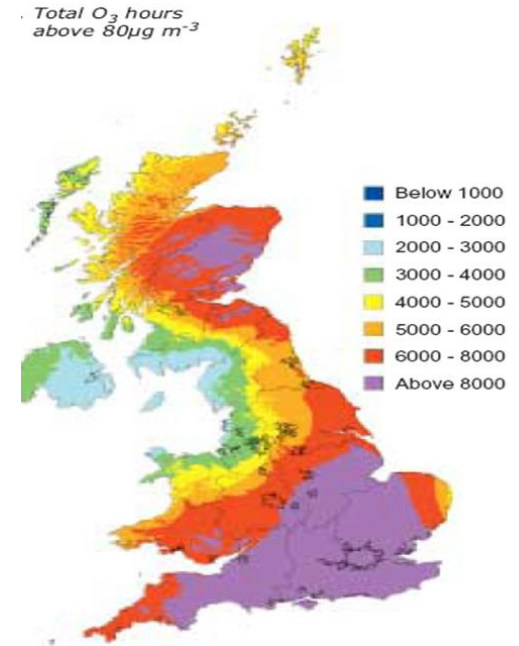
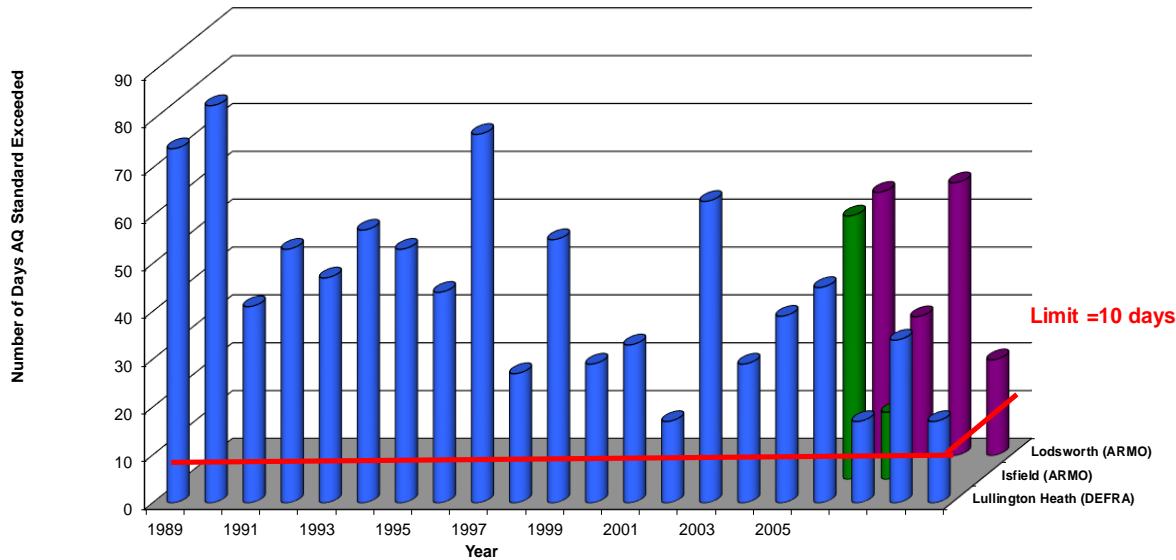
London smog's of the 1950's were typical winter-time inversions , fuelled by the local coal fired power stations, home heating and traffic = 4,000 deaths .



London's summer heatwave and associated smog of 2013 affected many vulnerable older people

Ozone pollution

Ozone- Number of days exceeding AQ Strategy Objectives in Sussex (1989 - 2006)
 (Air Quality Strategy Objective for (O3) Daily maximum 8-hour running mean > 100 $\mu\text{g}/\text{m}^3$ on more than 10 days)



Sussex ozone stations exceed the national objectives (10 days above 100 $\mu\text{g}/\text{m}^3$) every year.

- Rural locations tend to have higher ozone levels
- 3 ozone stations at Lullington Heath (S), Isfield (SE) and Lodsworth (NW)

Air quality standards and objectives

National and local air quality objective pollutants:

- Nitrogen Dioxide (NO₂)
- Particulate Matter (PM₁₀)
- Sulphur Dioxide (SO₂)

Plus:

- Benzene, 1,3-butadiene, lead and carbon monoxide

National (EU) objective pollutants (only):

- Ozone
- PM_{2.5}

Annex A: Air quality objectives contained in the Air quality (England) Regulations 2000 (2002 as amended)

| Pollutant | Objective | Averaging Period |
|------------------------------------|---|-----------------------------------|
| Nitrogen dioxide - NO ₂ | 200 µg m ⁻³ not to be exceeded more than 18 times/year | 1-hour mean |
| | 40 µg m ⁻³ | Annual mean |
| Particles - PM ₁₀ | 50 µg m ⁻³ not to be exceeded more than 35 times/ year | 24-hour mean |
| | 40 µg m ⁻³ | Annual mean |
| Sulphur Dioxide (SO ₂) | 266 µg m ⁻³ not to be exceeded more than 35 times/year | 15 minute mean |
| | 350 µg m ⁻³ not to be exceeded more than 24 times/year | 1 hour mean |
| | 125 µg m ⁻³ not to be exceeded more than 3 times/year | 24 hour mean |
| Benzene ⁴⁷ | 16.25 µg m ⁻³ | Running annual mean |
| | 5.00 µg m ⁻³ | Annual mean |
| 1,3-butadiene | 2.25 µg m ⁻³ | Running annual mean |
| Carbon Monoxide | 10.00 µg m ⁻³ | Maximum daily running 8-hour mean |
| | 10.00 µg m ⁻³ | Running 8-hour mean |
| Lead | 0.5 µg m ⁻³ | Annual mean |
| | 0.25 µg m ⁻³ | Annual mean |

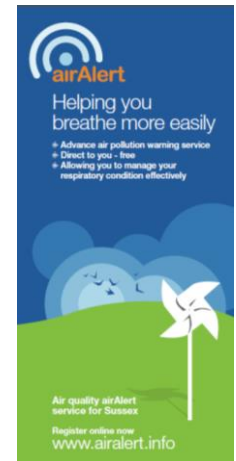
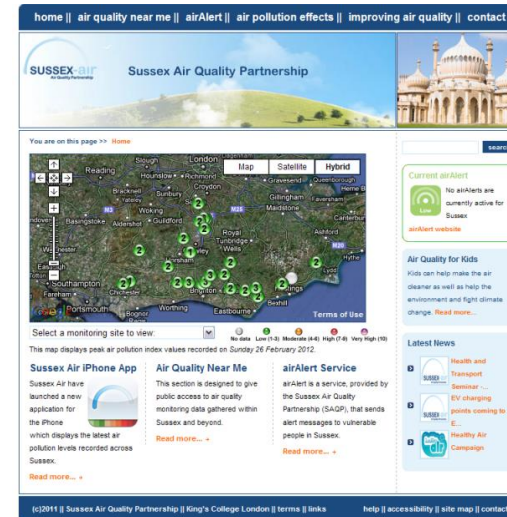
Local Air Quality Management

The Sussex Air Quality Partnership (Sussex-air)

Sussex-air members

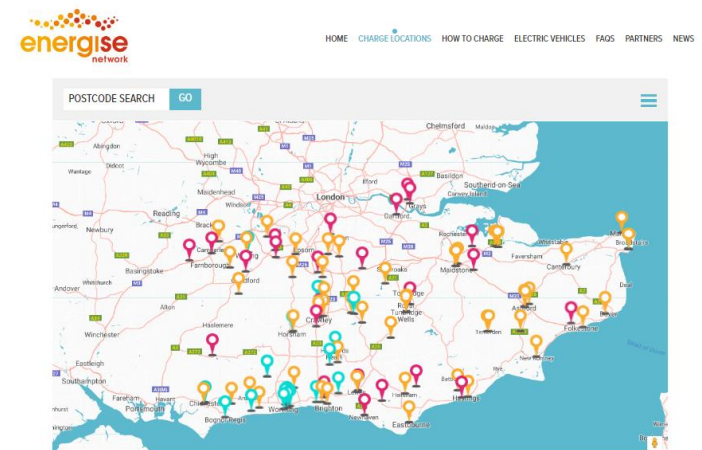
Air quality and sustainability officers:

- District / Unitary authorities (12)
- County Councils (2)
- The Environment Agency
- Public Health England (HPA)
- Public Health Authorities (Counties and BHCC)



Support and services include:

- AQ info: www.sussex-air.net Pollution alerts: www.airalert.info & www.coldalert.info
- Electric vehicle Network (Energise network) <http://www.energisenetwork.co.uk/>
- Air pollution and health impact research



Local Air Quality Management

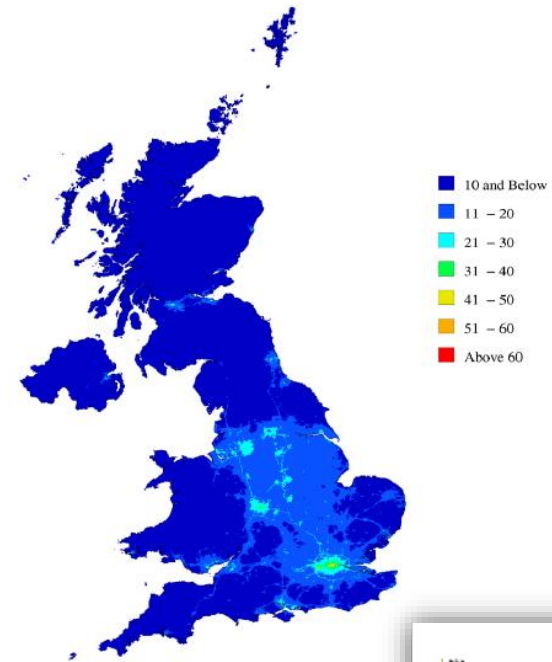
Figure 2.4. Annual mean background NO₂ concentration, 2013 (µg/m³)

Local Air Quality Management (LAQM)

Environment Act 1995 (section 82) requires local authorities to review the quality of the air and report to the government. LAQM is the mechanism under which local authorities operate.

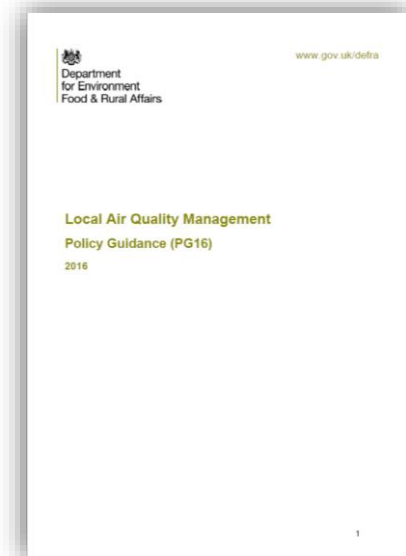
The annual “review and assessment” process follows the LAQM policy and technical guidance (LAQM.PG (16) and LAQM.TG (16)). The Annual Status Report require sign off by Public Health (DPH).

LAQM links to other national policy documents such as Nation Planning Policy Framework (NPPF) and Local Transport Plans (LTP)



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LAQM and Air Quality Management Areas

Air Quality Management Areas and Action Plans

AQMA's are declared in areas that exceed air quality objectives and require an Air Quality Action Plan to work towards improving air quality and reducing exposure.

Local authorities prepare Action Plans in consultation with local stakeholders and delivery partners, such as the Highways authority, SDNP, PH.

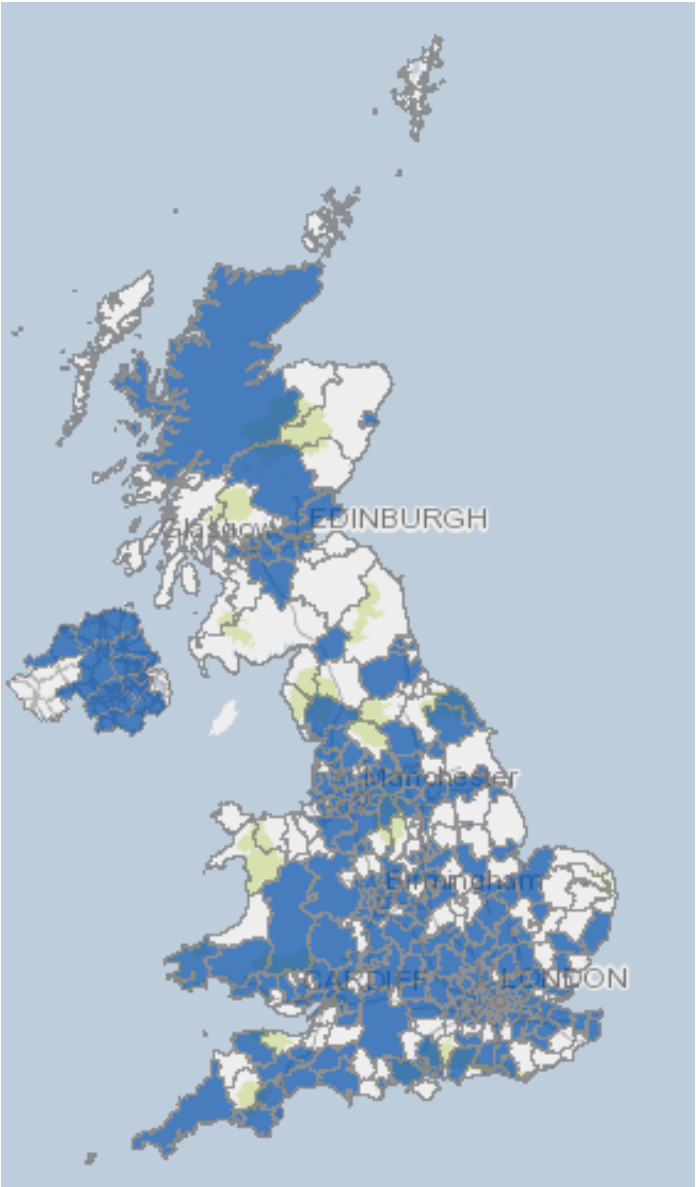
Action Plans can include measures or initiatives such as:

- Re-routing traffic, reducing access, parking, managing flows and volumes
- Uptake of low to ultra-low emission vehicles (ULEV) and infrastructure
- Provide sustainable travel options; car clubs, public transport (bus/tram/train),
- Planning policies/s106/CIL – guidance/SPDs and standards
- Linked to Public Health – active travel, cycling, health promotion/protection

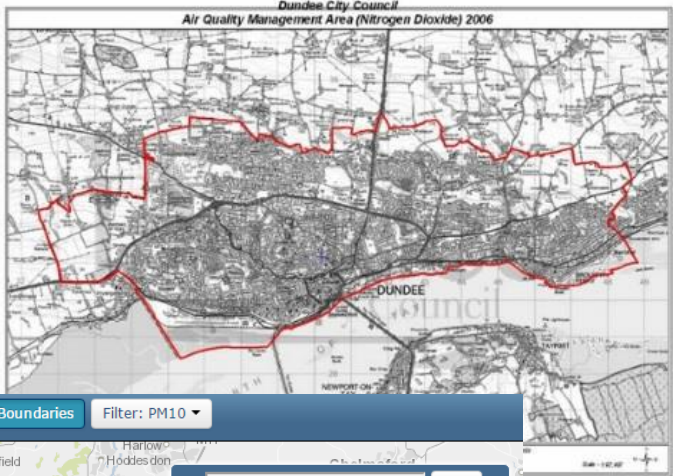
Air Quality Management Areas



There 703 Air Quality Management Areas in England (2016)



<http://uk-air.defra.gov.uk/aqma/maps>



Local Authorities with AQMA | AQMA Boundaries | Filter: PM10

Enter UK place/postcode... Zoom

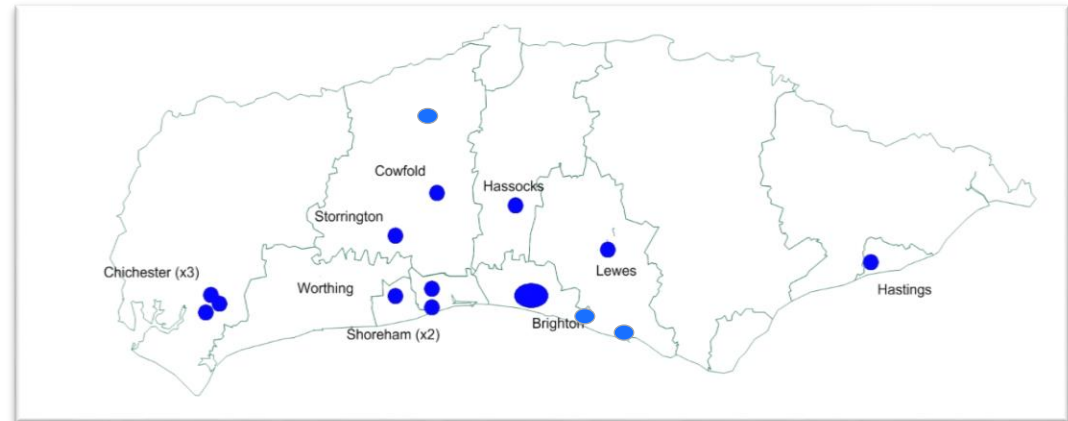
Bexley AQMA

- Local Authority: London Borough of Bexley
- Pollutants Declared: Particulate Matter PM₁₀ - Annual and 24-Hour Mean, Nitrogen dioxide NO₂ - Annual Mean
- Source: Transport and Industrial Source

[Read full details about this AQMA >](#)

Sussex has 15 AQMA's:

- Brighton, Chichester (3), Worthing, Shoreham (2), Storrington, Cowfold, Lewes, Hastings, Crawley, Newhaven, Hassocks, Rottingdean.



Brighton Bus Low Emission Zone

- BHCC implemented a central city Bus LEZ to improve air quality across city. The LEZ is based on Euro standards of buses.
- Ricardo Portable Emissions Monitoring System (PEMS) testing on Brighton buses



2014 – “Ricardo and Brighton & Hove buses work towards a cleaner environment”

Air Quality Action Plans

The Worthing AQAP will be developed in conjunction and to complement the A27 developments.

- AQAP will take into consideration other AQMA's (Storrington & Cowfold) to avoid redirecting pollution somewhere else.

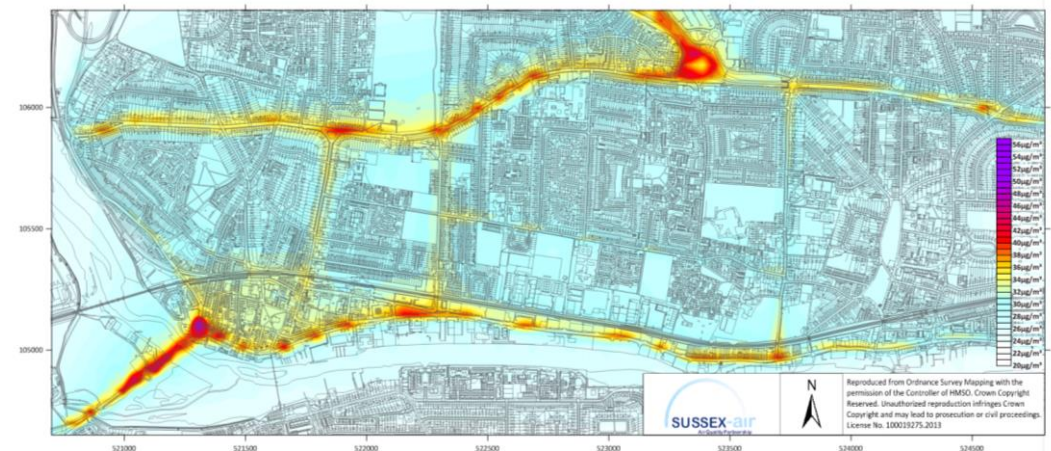
Shoreham AQAP will look toward LEZ/CAZ options to improve AQ.

- Complement and work with BHCC LEZ, Brighton Buses and WSCC.

Worthing – air quality modelling (2009/10)



Shoreham – air quality modelling (2009/10)



Thank you for listening

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