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Air Pollution: Planning Considerations

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What is Air Pollution?

- Air pollution is a mixture of particles and gases that can have adverse effects on human health.



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What are the main air pollutants?



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What are the main air pollutants?

- The most important primary air pollutants are particulate matter (PM) and nitrogen dioxide (NO₂).



Particulate matter (PM)



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Comparing size

● PM_{2.5}

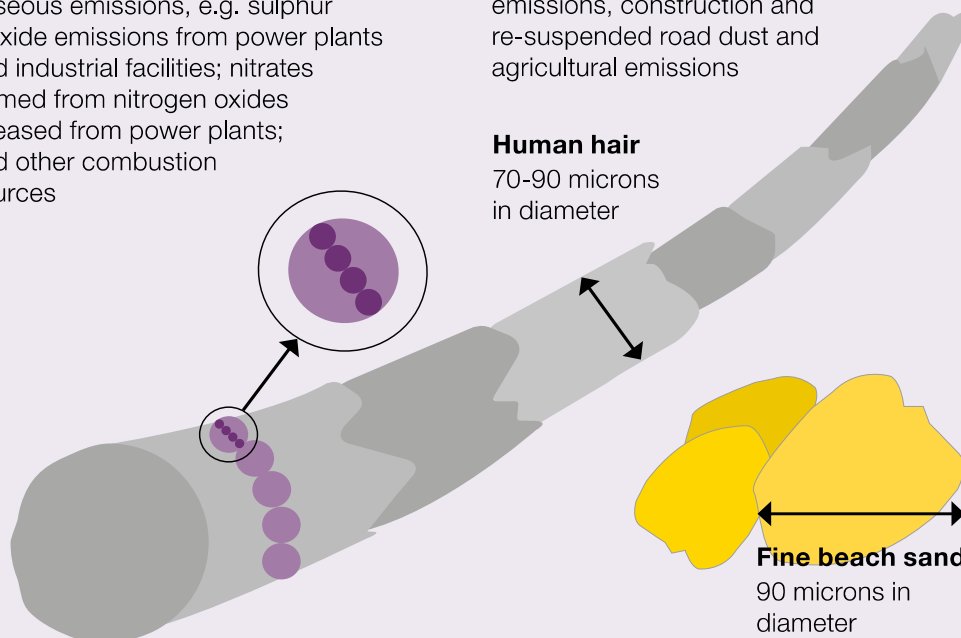
Includes secondary particles, formed in the atmosphere from chemical reactions involving primary gaseous emissions, e.g. sulphur dioxide emissions from power plants and industrial facilities; nitrates formed from nitrogen oxides released from power plants; and other combustion sources

● PM₁₀

Includes particulate matter from road transport (tyre wear, brake wear), wood burning, bonfires, shipping emissions, construction and re-suspended road dust and agricultural emissions

Human hair

70-90 microns in diameter



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PM_{2.5} (2.5 microns) leads to high plaque deposits in arteries, which contribute to hardening of the arteries, which can lead to heart attacks and other cardiovascular problems.



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Nitrogen dioxide (NO₂)

- Nitrogen dioxide is a gas that is produced with nitric oxide (NO) by combustion processes and together they are often referred to as oxides of nitrogen (NO_x).
- On average around 80% of oxide of nitrogen (NO_x) emissions in areas where the UK is exceeding NO₂ limit values are due to transport. The largest source is emissions from diesel light duty vehicles (cars and vans) and there has been significant growth in these vehicle numbers over the last ten years in the UK.

Other important air pollutants include....



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- Sulphur dioxide
- Non-Methane Volatile Organic Compounds
- Ammonia
- Ozone



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Air Pollution & Health

- AP is the largest environmental risk to the public's health
- It increases the chances of hospital admissions, visits to Emergency Departments and respiratory and cardiovascular symptoms which interfere with everyday life.
- In the most severe cases it increases the risk of death, especially for people who are already vulnerable.

Where air pollutants go in our bodies and what they do

A few hours of PM_{2.5} over 35 µg/m³ or NO₂ over 200 µg/m³ irritates the eyes, nose and throat.

PM can cause strokes. Ultrafine PM has been found in samples of brain and central nervous system tissue.

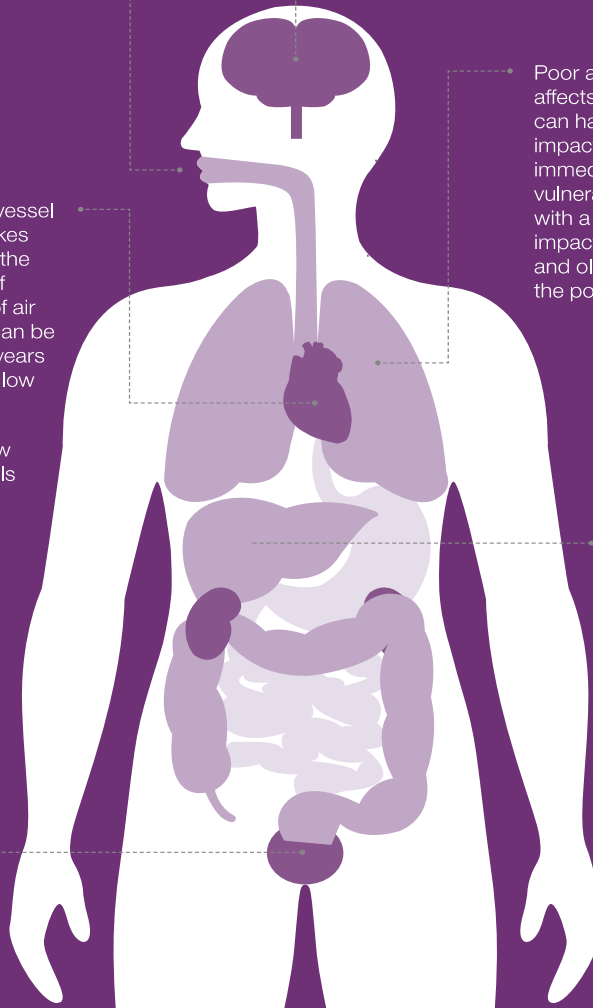
Poor air quality affects everyone. It can have long term impacts on all and immediate effects on vulnerable people, with a disproportionate impact on the young and old, the sick and the poor.

Heart and blood vessel diseases like strokes and hardening of the arteries are one of the main effects of air pollution. These can be caused by a few years exposure to even low levels of PM_{2.5}.

Exposure for a few hours to high levels of PM_{2.5} can bring on existing illness or strokes and heart attacks in ill people.

Ultrafine PM can get into the blood then throughout the body. Ultrafine particles have been found in body organs.

PM has been found in the reproductive organs and in unborn children.



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Air Pollution: Health Effects

- Defra has made an initial estimate that nitrogen dioxide (NO₂) contributes to shortening lives by an average of around 5 months
- This overall population burden is estimated to be equivalent to nearly 23,500 deaths in the UK per year.
- There is likely to be an overlap in the health burden associated with ambient concentrations of particulate matter (PM) and NO₂.



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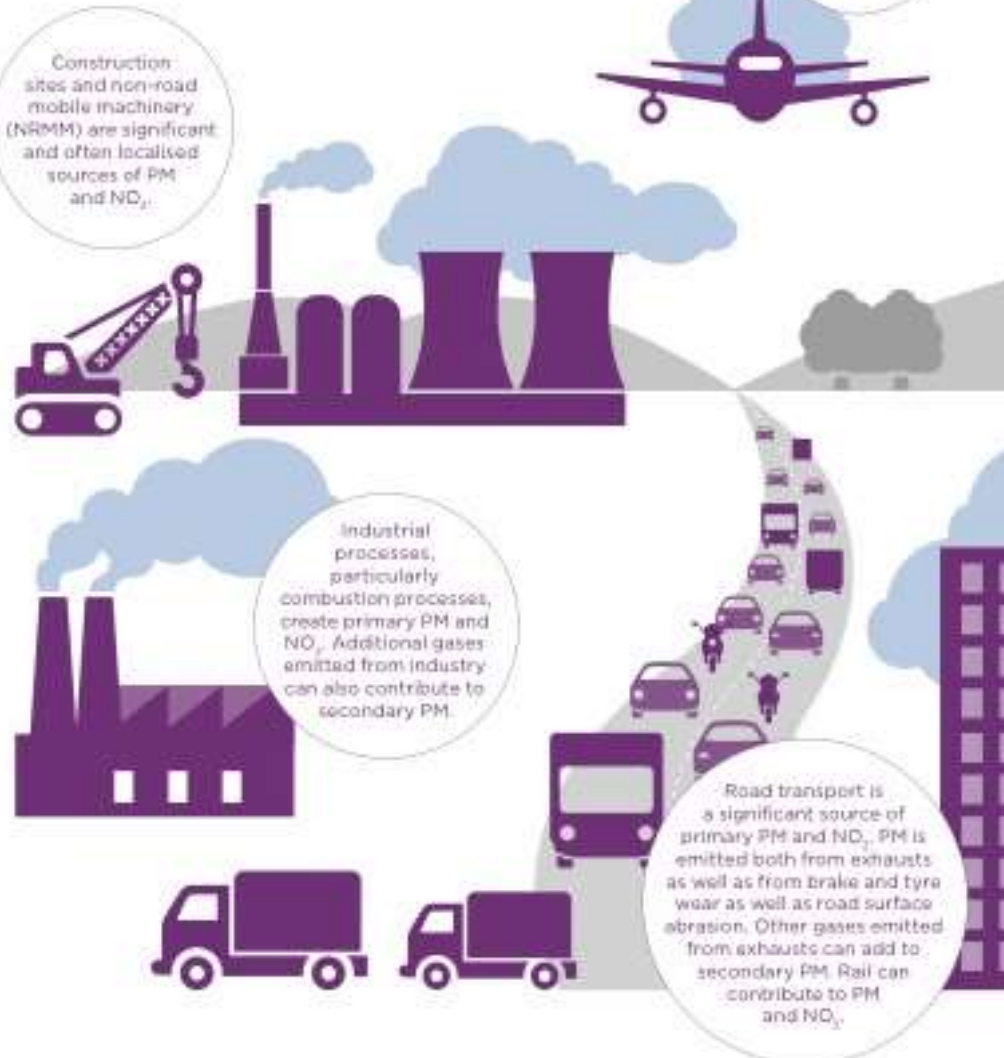
Safe Levels?

- Legal limits are in place to protect human health. Evidence suggests that health effects can still occur well below these limits. There are no absolutely safe levels of PM, one of the main pollutants of concern.

What are the sources of air pollution and where are people exposed?



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Table 1 Air pollution limits from EU Directives

Pollutant	EU Limit	Averaging Period	Permitted number of exceedances
NO₂	200 µg / m ⁻³	1 hour	18
	40 µg / m ⁻³	Annual	-
PM₁₀	50 µg / m ⁻³	24-hours	35
	40 µg / m ⁻³	Annual	-
PM_{2.5}	25 µg / m ⁻³	Annual	-
	(20 µg / m ⁻³ by 2020)		
Ozone	120 µg / m ⁻³ (target)	8 hour running or hourly	25 days averaged over three years

Research Briefing, Air Quality, Robert Abernathy, February 2018

Legal Framework

- Largely driven by EU legislation (query: Brexit)
- Devolved responsibility
- Outdoor Air pollution- Air Quality Standards Regs
- Nitrogen Dioxide: Defra national plan (focus of ClientEarth litigation)
- Local Air Quality Management Guidance, June 2017
- Local Authorities: AQMAs
- The Clean Air Plan for Wales
- Clean Air Zones: forthcoming Clean Air Zone Framework in the Welsh Plan

Air Quality Management Areas

- There are 39 AQMAs in Wales, spread across 11 Local Authorities in South Wales (Figure 3 and Figure 4). With the exception of Neath Port Talbot, all the AQMAs are due to NO₂, associated with roads.
- Any Local Authority with an AQMA is required to put in place an Air Quality Action Plan, ideally within 12 months of an AQMA being declared.

Air Quality Management Areas



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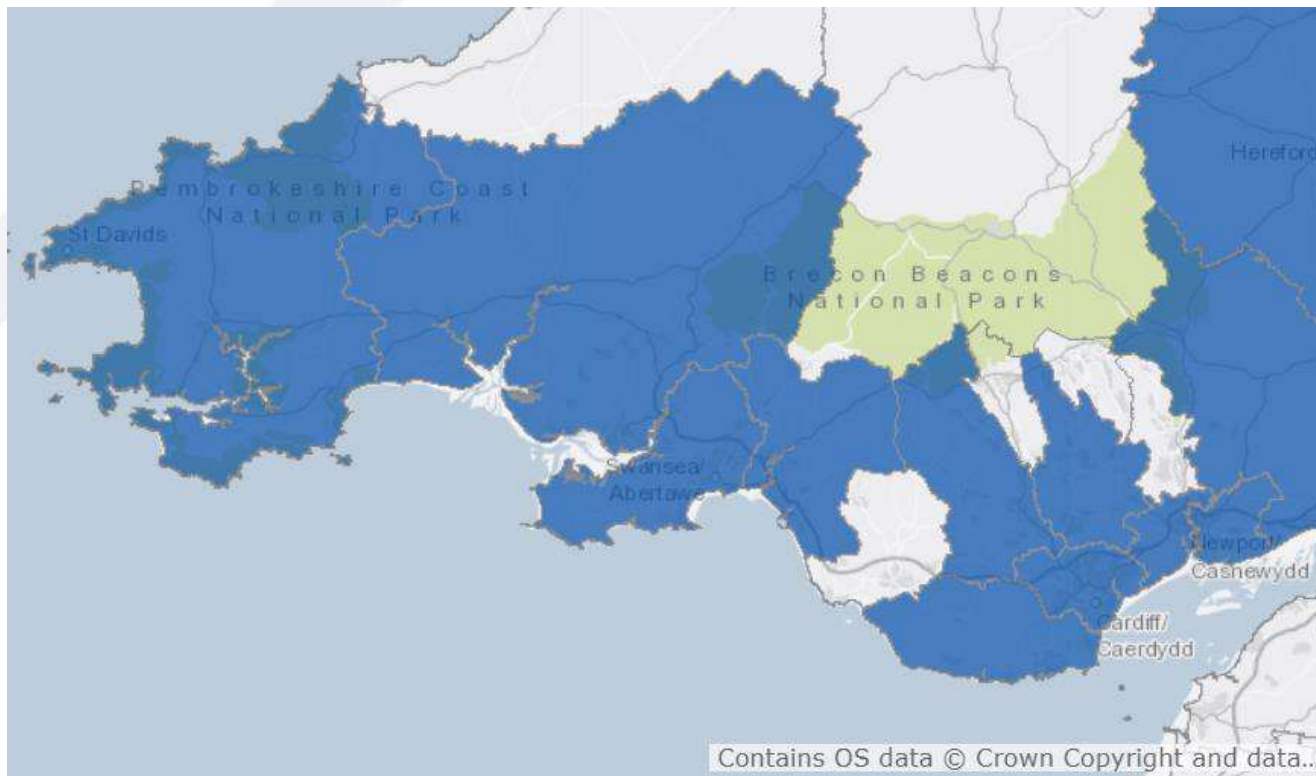


Figure 3 Map of Local Authorities with AQMA in Wales



Air Quality Management Areas

- The record of success for AQMAs is unclear. Only five have ever been revoked in Wales, although several more have been amended.
- Reports for air pollution in Wales have only included the exceedances of NO₂ limits since 2014, making it difficult to tell if exceedances are increasing or decreasing overall.

Air Quality Management Areas

- The Neath Port Talbot AQMA was declared in 2000 due to high PM10 levels, associated with the large industrial site adjacent to the area.
- This proved insufficient with the site continuing to exceed, or come very close to exceeding, the permitted number of exceedances for the daily PM10.
- The Welsh Government instituted a short term action plan in 2008, which was updated in 2012. The number of exceedance days depends strongly on the activity of the Port Talbot steelworks.

ClientEarth Litigation

- ClientEarth took the UK Government to court over its failure to comply with EU limits on air pollution.
- This resulted in a series of rulings against the UK Government in the UK Supreme Court and the High Court.
- Legally binding EU regulations state that exceedances of air pollution limits must be kept as short as possible. The UK Government action plans did not predict compliance until 2025 in some cases, so the court ruled that the UK Government must submit new air quality plans.



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ClientEarth Litigation

- In the third round of litigation concerning the plans ClientEarth included the Welsh Government in the action, due to continuing failures to comply with EU regulations.
- The Welsh Government admitted a breach of the law and ClientEarth and the Welsh Government reached an agreement in the form of a binding-consent order.



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- The Clean Air Plan for Wales is expected to be published for consultation in April 2018



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Gladman Developments Ltd v SSCLG and CPRE Kent [2017] EWHC 2768 (Admin)

- The High Court dismissed a challenge seeking to quash an appeal inspector's decision to refuse permission for 140 homes in Kent due to the developer's failure to mitigate harm to a designated air quality management area.





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Gladman Developments Ltd

- The court held that the inspector was under no obligation to assume air quality would improve in line with measures in the government's air quality plan, while the European air quality directive was not a "parallel consenting regime" for the purposes of paragraph 122 of the NPPF, so the inspector was entitled to take into account the development's impact on nitrogen dioxide emissions.
- The court held that the developer's proposed financial contribution had not been shown to offer actual measures to reduce pollution.



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- The emerging importance of air quality in planning decisions; and
- the need for developers to think seriously about the effectiveness of mitigation proposals.

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“Alongside national measures, local leadership is essential. Local authorities have a central role in achieving improvements in air quality; their local knowledge and interaction with the communities that they serve mean that they know the issues on the ground in detail. They are best placed to decide and work with partners to implement the appropriate solutions in regards to local transport, smoke control, planning and public health...”



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Final Thoughts

- Interventionist court
- The 'activist lawyer'
- Campaign for 'a right to clean air' in law: new Clean Air Act?
- New Clean Air Plans with new policies to achieve compliance
- Decision making; CAZ & AP to the top of the agenda
- Plan making: major infrastructure; airports?
- The future of diesel: DUH challenge in Germany
- Brexit: what happens next?





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Any questions?

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