Air Quality and Climate Change: A UK Perspective

A report by the Air Quality Expert Group

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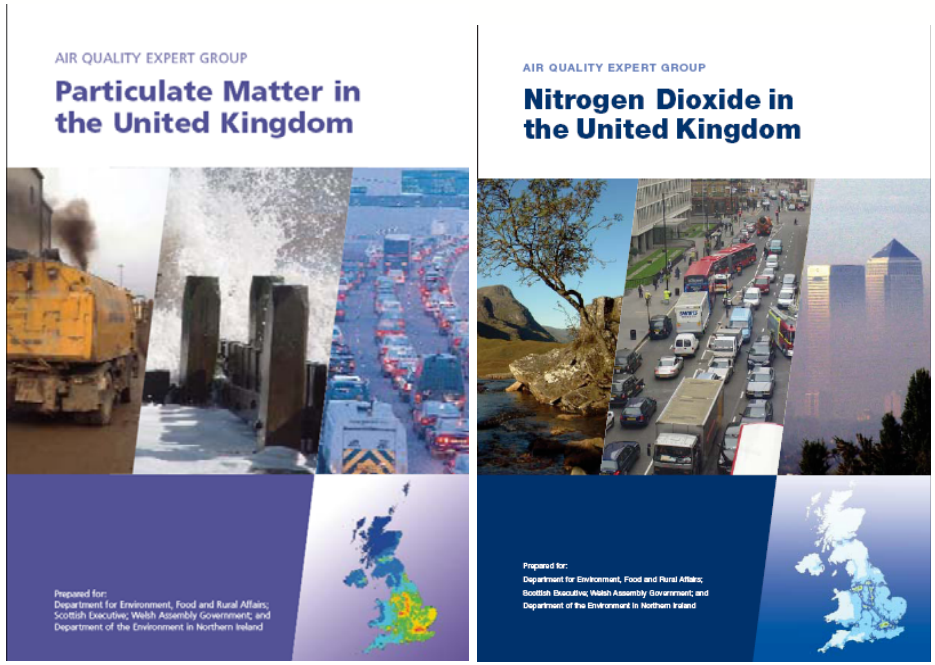
The Air Quality Expert Group (AQEG)

- Independent expert group, funded by UK Government
- Set up in 2001 to provide independent scientific advice on air quality
- Reports:
  - NO_2 in the UK (2004)
  - PM in the UK (2005)
  - **Air Quality and Climate Change (30 March 2007)**
  - Trends in Primary NO_2 in the UK (Summer 2007)
  - Ozone in the UK (draft summer 2007)



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AQEG asked to:

- Examine linkages between mitigation policies for AQ and CC
- Examine the scientific background to these interactions
- Identify:
  - **Synergies** – where measures to improve AQ can help ameliorate CC
  - **Trade-offs** – where policy measures in the two areas act in opposition

Background

- AQ and CC policy areas – developed independently
- Different geographical scales and lifetimes of pollutants
- Many of the same sources e.g. power generation
- Significant reductions in AQ pollutants, only small reductions in CO_2

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Measures that could increase AQ & CC emissions

Measure		Effect
Increased demand for products/services		For example aircraft – efficiency gains outweighed by increased demand
Transport modal shifts		Increase in short-haul flights at expense of rail
Increased use of coal for energy generation		If used in place of renewables, nuclear or natural gas
Certain use of biofuels?		N_2O from fertiliser Import and fuel-chain emissions ↑ AQ emissions

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AQ measures that could increase CC emissions

Measure		Effect
Power Generation Flue gas desulphurisation		Reduced generation efficiency CO_2 formation through wet scrubbing
Transport Abatement of AQ emissions		Efficiency costs → increased CO_2 Potential to increase N_2O
Reduced S in fuel		Increased refinery CO_2 emissions

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CC measures that could increase AQ emissions

Measure		Effect
Increased aircraft fuel efficiency		Reduction in CO_2 but increase in NO_x
Fuel-switching (transport)		Increased use of diesel in place of petrol → increased NO_x and PM
Certain use of biofuels		N-based fertilisers → increased NH_3
General Transport fuels Domestic use		Increased emissions of AQ pollutants from processing and use
Waste management		Incineration in place of landfill
Forests as a sink for carbon		Increased biogenic emissions

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Measures that could improve AQ & CC emissions

Measure		Effect
Power Generation		
Fuel switching to low C or renewables		Reduction in CO_2, SO_2 and NO_x
Combined heat and power		Reduction in AQ and CC pollutants
Transport		Reduce point of use and fuel chain emissions
New technologies and fuels		
Low emissions zones		Incentivise more efficient vehicles
Efficiency Improvements		
Demand management		Proportionate reduction in AQ and CC pollutants
Conservation		Benefits can be reduced through increased demand
Behavioural change		

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Key Findings – Mitigation measures

- Comparing AQ and CC problematic
  - No common metric
  - Seldom considered together
- Need for lifecycle analysis
- Measures that result in the biggest wins:
  - Reduction in demand
  - Efficiency gains
- These can be achieved in many ways including:
  - Demand management
  - Improved technology

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Available at:

http://www.defra.gov.uk/environment/airquality/aqeg