Air Quality Management: London Experience

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Overview

- Where we were
- Causes
- Options
- Strategy and measures taken
- Where we are now
- Lessons
  - Analysis of problem
  - Assessment of options
 - Planning
- Conclusions

Where we were

- Weak regulation of industrial combustion
- Domestic unregulated
- Severe smogs locally over many centuries
- But no effective action because no political will, poor information and dependence on highly polluting technology
- Great winter smogs of 1952/ 1953
- Immediate impacts 4000+ mortality in London

Figure 1
Smoke and sulphur dioxide concentrations at County Hall during the London smog of December 1952 compared to the average concentrations in December 1951

Source:
London County Council 1953

Smoke December 1952
Smoke December 1951
Sulphur dioxide December 1952
Sulphur dioxide December 1951

December 1952
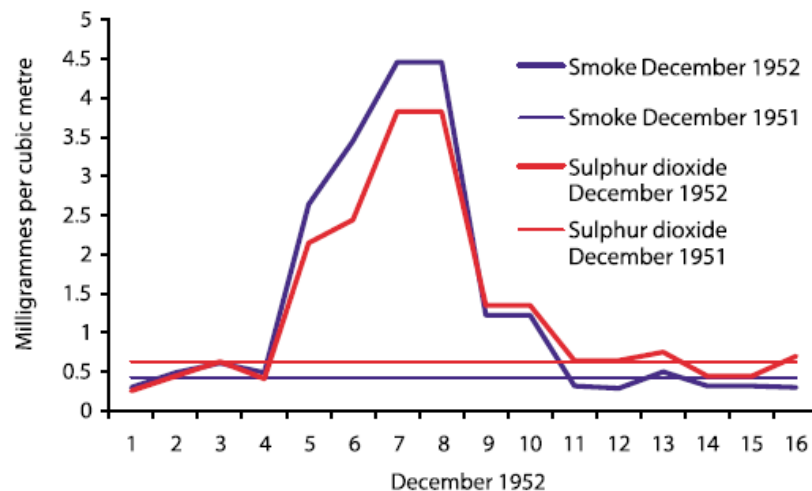
Deaths from Great Smog of 1952
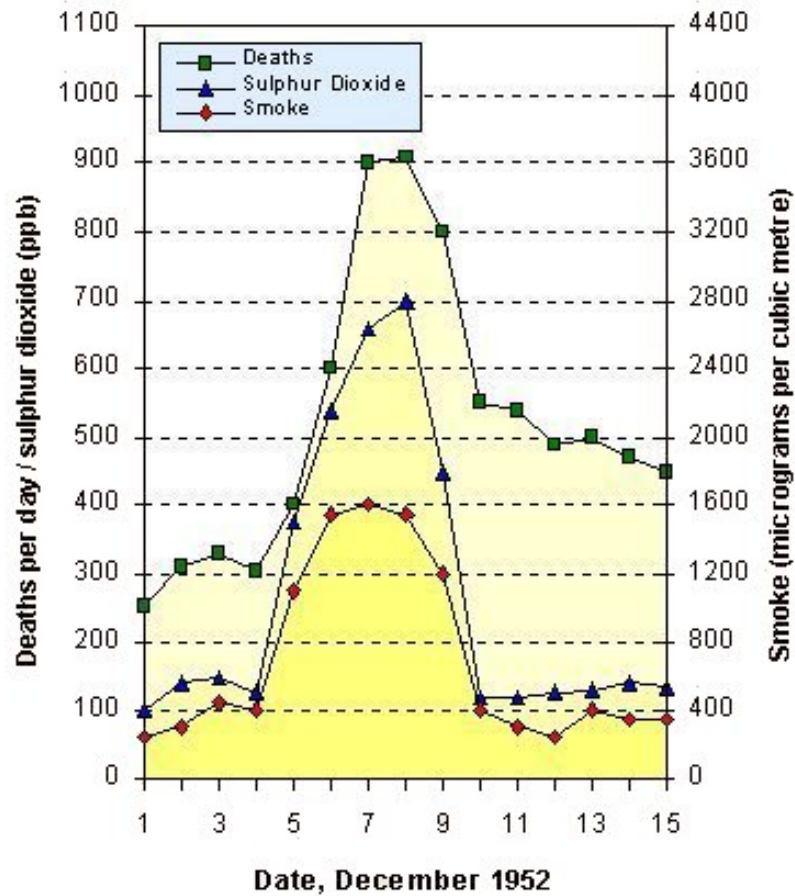
Causes

- Coal burning in homes, power stations, factories (high sulphur coal)
- Main end use: space heating (cooking by gas)
- Open grates in homes: inefficient combustion
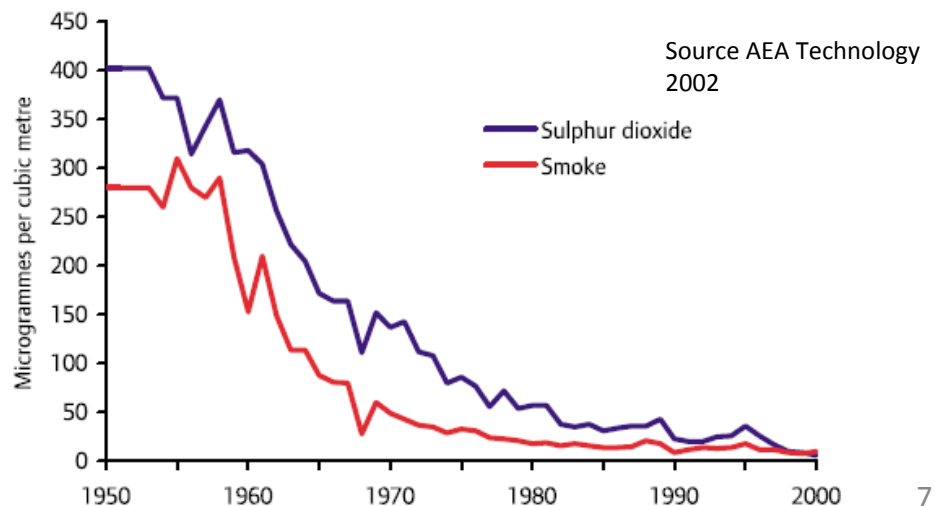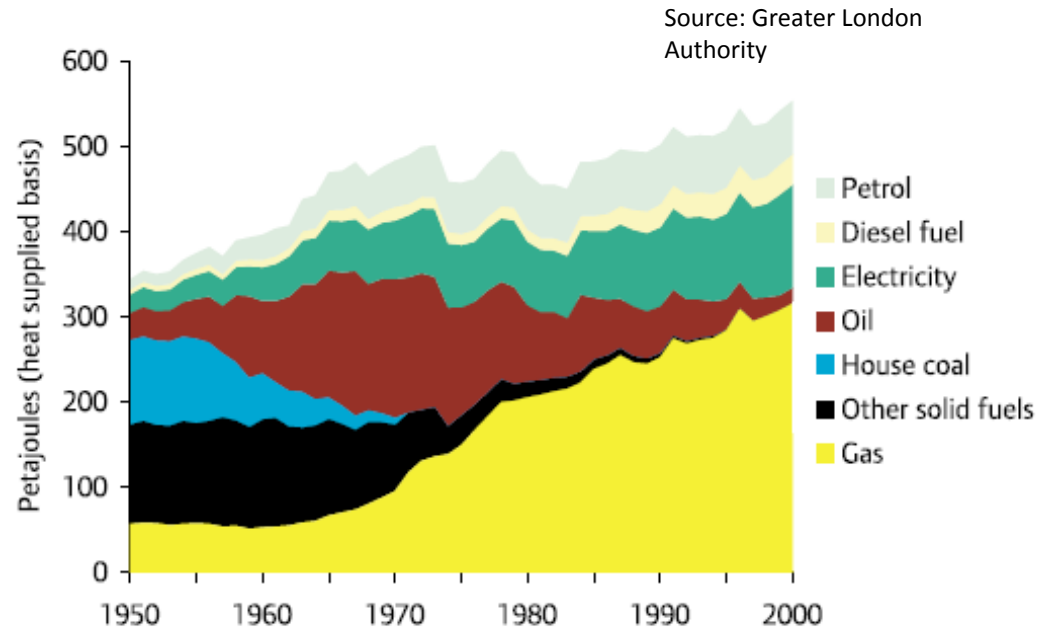- Urban power stations (Bankside, Battersea)

Options

- Cleaner fuels
  - "smokeless" solid fuel
  - Gas
  - Paraffin (oil-derived liquid fuel)
  - Electricity (urban use, generated out of urban areas)
- Cleaner combustion
  - Stoves (solid fuel or paraffin)
  - Gas-fired central heating
- Energy efficiency
  - Insulation
  - Draught proofing

Strategies and Measures

- Government slow to act (4 years to Clean Air Act)
- Beaver Committee 1953 to 1955:
  - Domestic coal burning identified as main cause
  - Action to ban use of coal in "smoke control areas"
- Switch to oil (paraffin) short term
- Gas as space heating fuel, longer term
- Measures codified in Clean Air Act 1956

Source: Greater London Authority

Petrol
Diesel fuel
Electricity
Oil
House coal
Other solid fuels
Gas

Source AEA Technology 2002

Sulphur dioxide
Smoke

Where we are now

- Central heating in almost all buildings

- Gas dominant space heating fuel in homes

- Main cause of poor ambient air quality is now traffic

- Levels controlled by EU legislation

- Traffic, mainly diesel particulate matter, the main ambient issue now

- Indoor pollution is significant factor in exposure

Lessons learned: Analysis

Effective strategy requires knowledge:

- Know the nature of the problem (pollutants and impacts)

- Know the immediate causes (inventories of sources and emissions)

- Know the root causes (demand for energy services: space heating; mobility; distribution; cooking)

- Understand options (performance, costs, implementation time scales)

- Focus on health/exposure means including indoor air quality

Lessons learned: Assessment of Measures

Effective measures match urgency to implementation time scales:

- Short term measures: fuel switch and current combustion (smokeless solid fuel)

- Medium term measures: new equipment (oil/gas electricity for heating)

- Long term measures: energy services (energy saving/efficiency, neighbourhood heating)

Lessons Learned: Planning

Effective planning requires flexibility, experience suggests:

- Act fast (never waste a crisis: public support for action will be at its strongest, a good time to bid for resources, staff, training!)

- Make a Road Map with milestones and a mix of measures

  - Set long-term aims first (certainty for industry about end points)

  - Then negotiate timetable (taking technology/product ladders into account)

- Ensure one final regulator (splitting transport from stationary source regulation a big mistake!)

- Engage with civil society/environmental interest groups/residents associations to ensure enduring support

Conclusions

- 1952 Smog a major wake-up call
- Much progress since then on smoke control and domestic emissions
- Main gains from gas and electricity for space heating
- Traffic now main urban pollutant
- Progress from EU standards for vehicle emissions
- But more to be done: clean air in cities will require cleaner vehicles (electricity for light duty and gas for heavy duty)
- Lessons from the past:
  - knowledge and understanding,
  - assessment of options,
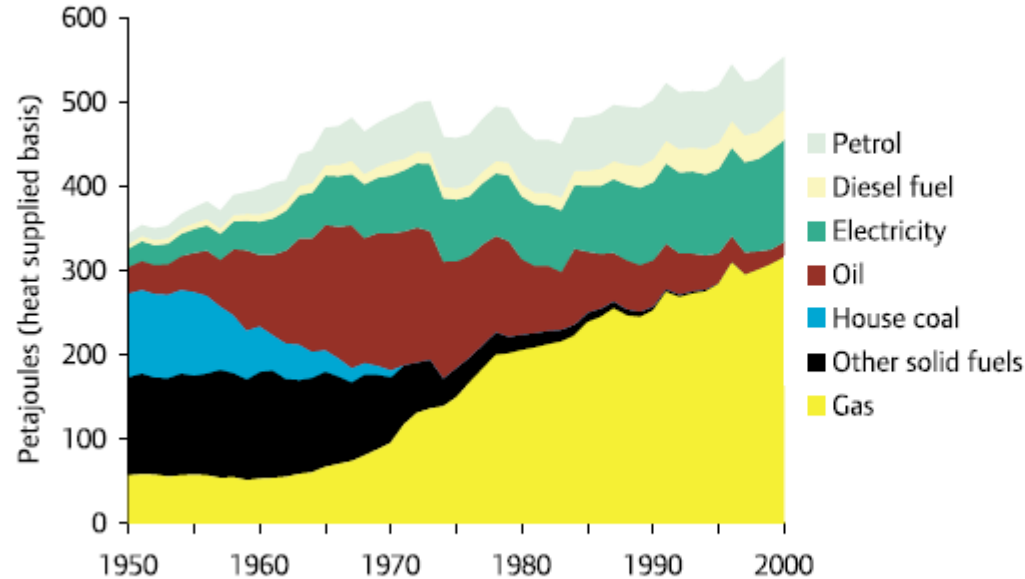 - Effective planning
- Change is possible!

December 1952

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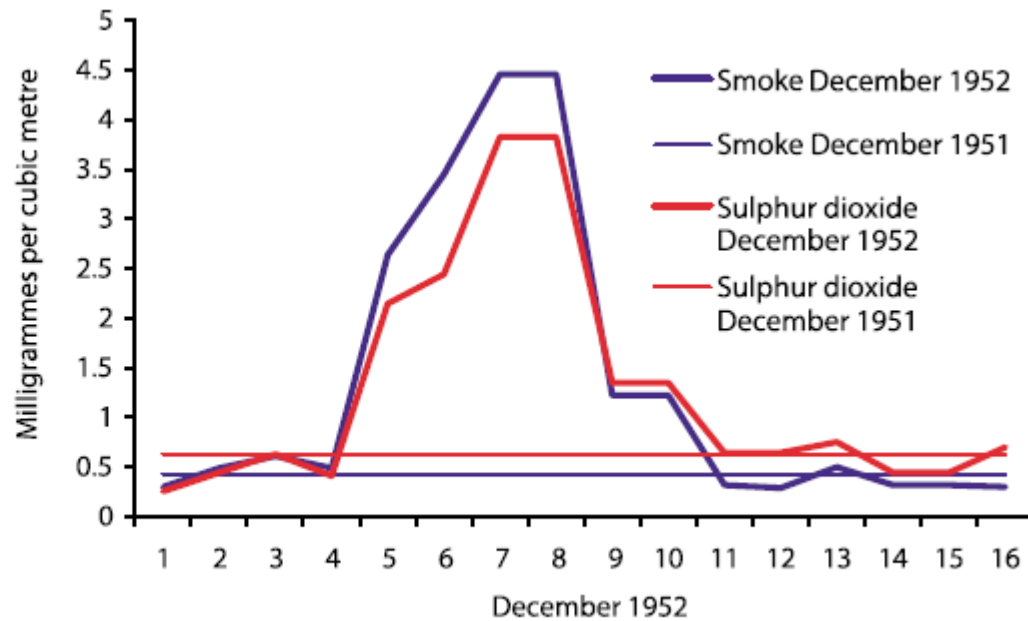
Fuels in Use

Figure 4
Energy use in London 1950–2000

Source:
Greater London Authority

Note:
- Gas is a major factor post 1965
- House coal reduction main short term measure
- Oil was main short term "gap filler"
- Electricity play an important part

Impacts of Strategies and Measures

**Figure 3
Annual average smoke
and sulphur dioxide
concentrations in London
1950 to 2000**

*Source:
AEA Technology Environment
2002*

*Note:
Before 1954 data
was only published
as 5-year averages*