

A Short History of Air Pollution

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Introduction

Air Pollution has been around a long time.

Roman philosopher, Seneca, wrote of the heavy air of Rome in 61 AD.

Edward I of England banned the burning of sea coal in craftsman's furnaces be prohibited because of foul smelling fumes, 1306.

Elizabeth I of England banned the burning of coal while Parliament was in session.

Air Pollution Episodes

- ◆ Meuse Valley (Belgium) - 1930
- ◆ Donora, PA - 1948
- ◆ Poza Rica (Mexico) - 1950
- ◆ London - 1952
- ◆ New York - 1953 to 1966
- ◆ Bhopal (India) - 1984

Some Systems of the Human Body Effected

- ◆ Respiratory
- ◆ Cardiovascular
- ◆ Skin and eyes
- ◆ Other

Examples of Health Effects on Respiratory System

- ◆ Bronchitis (acute and chronic)
- ◆ Pulmonary emphysema
- ◆ Lung cancer
- ◆ pneumoconiosis
- ◆ cough
- ◆ chest pain

Examples of Health Effects from Air Toxics

- ◆ Cancer
- ◆ Respiratory irritation.
- ◆ Reproductive toxicity
- ◆ Developmental effects
- ◆ Pulmonary toxicity
- ◆ Liver toxicity

Changes in Society and the Economy

- ◆ Population growth
- ◆ Industrialization
- ◆ Growth and distribution of wealth
- ◆ Changing social attitudes
- ◆ Environmental activism

Local Control Initiatives

- ◆ 1661 - London, smoke control
- ◆ 1880's - Chicago and Cincinnati, municipal regulation of smoke emissions
- ◆ 1940's - Pittsburgh, public protest against smoke; changes in fuels, combustion practices
- ◆ 1980's - Denver, Metropolitan Air Quality Council

State Control Initiatives

- ◆ 1940's - California and LA County study causes and effects of smog
- ◆ 1952 - Oregon: first state air pollution control agency
- ◆ 1980's - growth of state air toxic programs
- ◆ 1990's – Regional Approaches – NOx SIP Call

Federal

- ◆ Research and studies
- ◆ Need for National perspective - pollution respects no State borders
- ◆ USEPA established in 1970

Major Legislative Landmarks

- ◆ Air Pollution Control Act - 1955
- ◆ Clean Air Act - 1963
- ◆ Air Quality Act - 1967
- ◆ Clean Air Act - 1970
- ◆ Amendments to CAA - 1977
- ◆ Amendments to CAA - 1990

Clean Air Act of 1970

- ◆ USEPA

- ◆ Air Quality Management

 - NAAQS

 - SIPs

- ◆ NESHAP/NSPS

- ◆ Citizen Lawsuits

Clean Air Act Amendments of 1977

- ◆ Nonattainment
- ◆ PSD
- ◆ Strengthened mobile source provisions
- ◆ Visibility/Stratospheric Ozone

Clean Air Act Amendments of 1990

- ◆ Major change in approach to attainment/nonattainment
- ◆ Overhaul of hazardous air pollutants
- ◆ Market based incentives
- ◆ Enhanced ozone monitoring - PAMS

Criteria Pollutants

- ◆ Regulated under NAAQS
- ◆ Ubiquitous
- ◆ Health-based standards
- ◆ Standards apply to all States equally
- ◆ SIPs

Criteria Pollutants

- ◆ Particulate Matter
- ◆ Lead
- ◆ Sulfur Dioxide
- ◆ Carbon Monoxide
- ◆ Nitrogen Dioxide
- ◆ Ozone (ground level)

Hazardous Air Pollutants

- ◆ Any of 189 chemicals and compound groups listed in CAAA of 1990 as hazardous air pollutants
- ◆ List can be revised as new substances are found

Some Hazardous Air Pollutants

- ◆ Asbestos
- ◆ Benzene
- ◆ Carbon Tetrachloride
- ◆ Chlordane
- ◆ Chloroform
- ◆ Formaldehyde
- ◆ Heptachlor
- ◆ Hydrochloric Acid
- ◆ Methanol
- ◆ Phenol
- ◆ Toluene

Environmental Effects of Air Pollution

- ◆ Ecosystem effects
- ◆ Property damage
- ◆ Quality-of-life effects
- ◆ Global climate change

Ecosystem Effects

- ◆ Acidification of lakes and stream
 - Wildlife
 - Aquatic life
 - Population of endangered species
- ◆ Vegetation Damage (forests, crops, ornamental plants)
- ◆ Other natural resource damage

Property Damage

- ◆ Acid rain: damaged buildings, ornamental plants, etc.
- ◆ Ozone: causes cracking of rubber, nylon, polymer plastics, etc.
- ◆ Particulate matter: causes soiling
- ◆ Sulfur dioxide: causes deterioration of metal and stone

Quality-of-Life Effects

- ◆ Reduced visibility - acid rain and smog
- ◆ Reduced enjoyment of outdoors
- ◆ Added work - cleaning of soiled property
- ◆ Detrimental economic effects - damaged cash crops