AMERICAN LUNG ASSOCIATION®

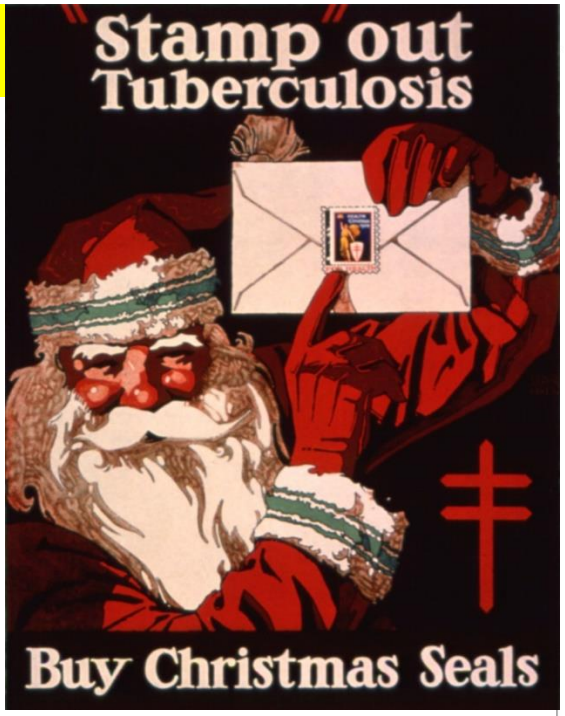
CLEAN AIR CHOICE®

CLEAN AIR CHOICE® IMPROVING THE AIR WE BREATHE

Angela Tin
March 2018

OUR HISTORY – 1904 TO TODAY

- National Tuberculosis Association
- Oldest voluntary heath organization
- Before EPA (outdoor)
- Public Health (indoor)
- Environmental Pollution to Health Concerns
- 2004 Alternative Fuels Program (Midwest states)



WHEN YOU CAN'T BREATHE, NOTHING ELSE MATTERS

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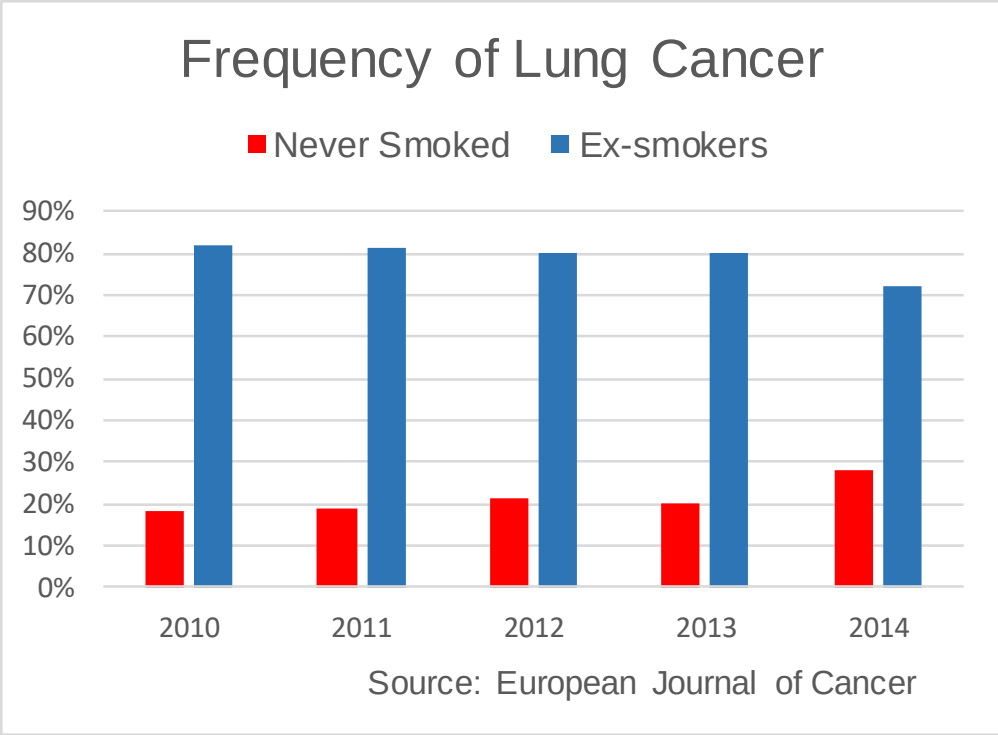
CAUSES OF LUNG DISEASE & CANCER

1. **Smoking**
2. Exposure to radon gas
3. Exposure to chemicals –workplace (asbestos, silica)
4. **Air pollution – transportation/industrial sources**
5. Previous lung disease - tuberculosis
6. Family history of lung cancer
7. Past cancer treatment
8. Previous smoking related cancer (tobacco products)
9. Lowered immunity (AIDS, HIV)

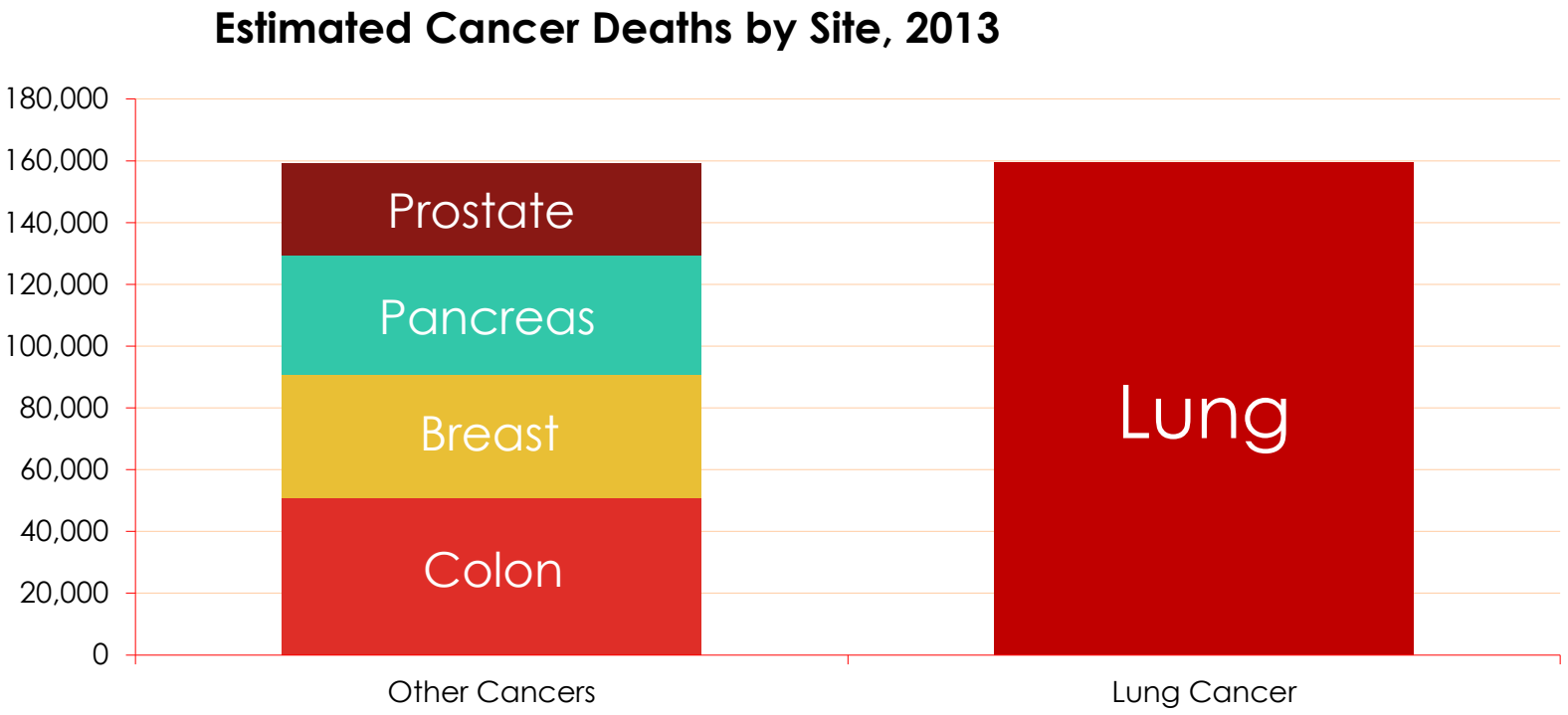
ACTIONABLE VERSUS LIMITED ACTION

LUNG CANCER

- Cigarette smoking rates have decreased (20% – 16%)
- **2/3 lung cancers occur in never/ex smokers**



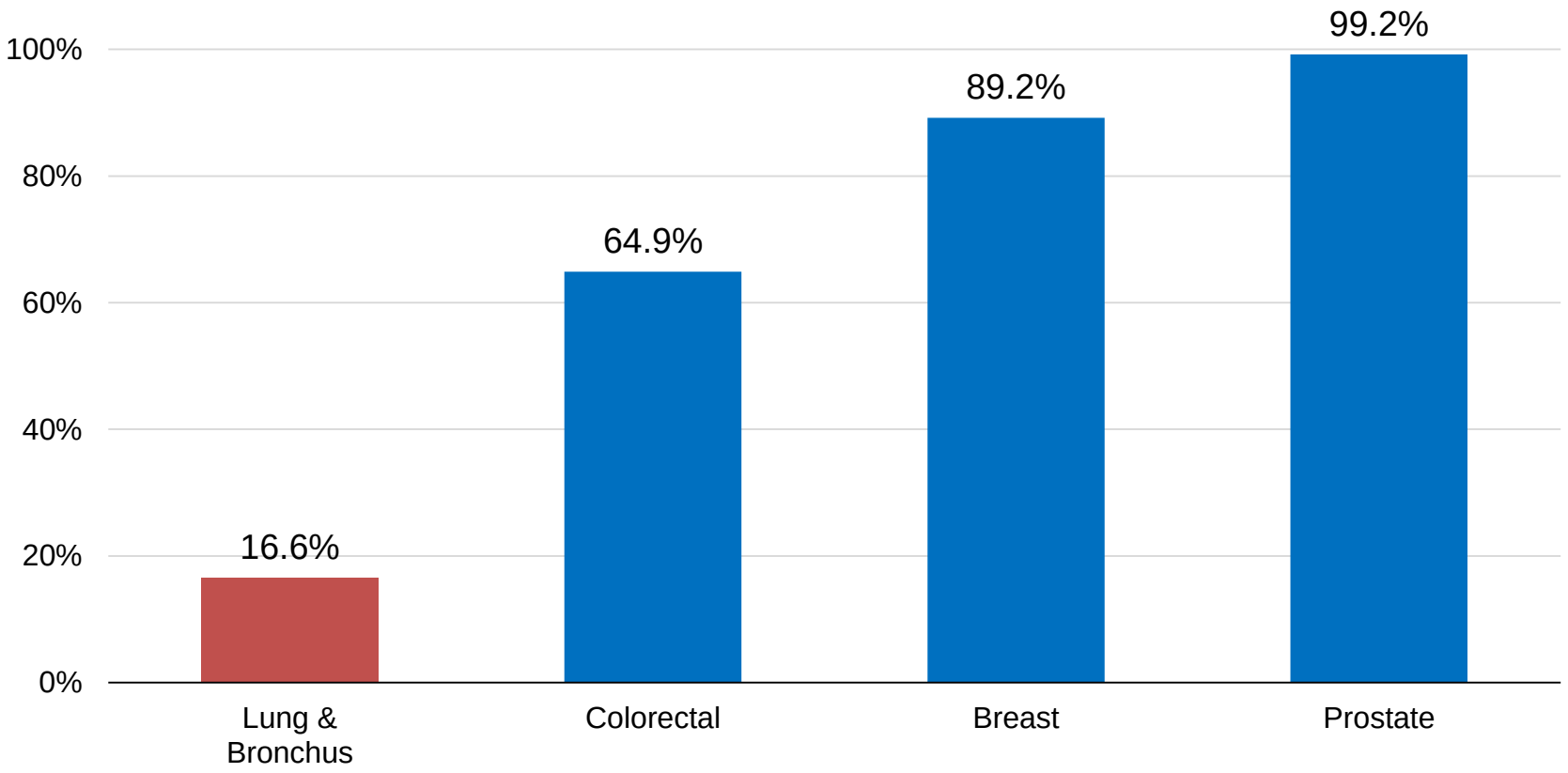
LUNG CANCER IS THE DEADLIEST CANCER



Source: American Cancer Society. Cancer Facts & Figures 2013

MOST LUNG CANCER IS CAUSED BY SMOKING (WHILE THE NUMBER OF SMOKERS ARE DECREASING, THE INCIDENCE OF LUNG CANCER IS INCREASING)

5 YEAR SURVIVAL RATES



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ENVIRONMENTAL POLLUTION

- Direct relationship between medias
- Indoor or outdoor pollution
- Consequence of daily life advantages

AIR ENVIRONMENTAL POLLUTION

Health Conditions linked to Air Pollution exposure (such as lung cancer and emphysema) are often fatal

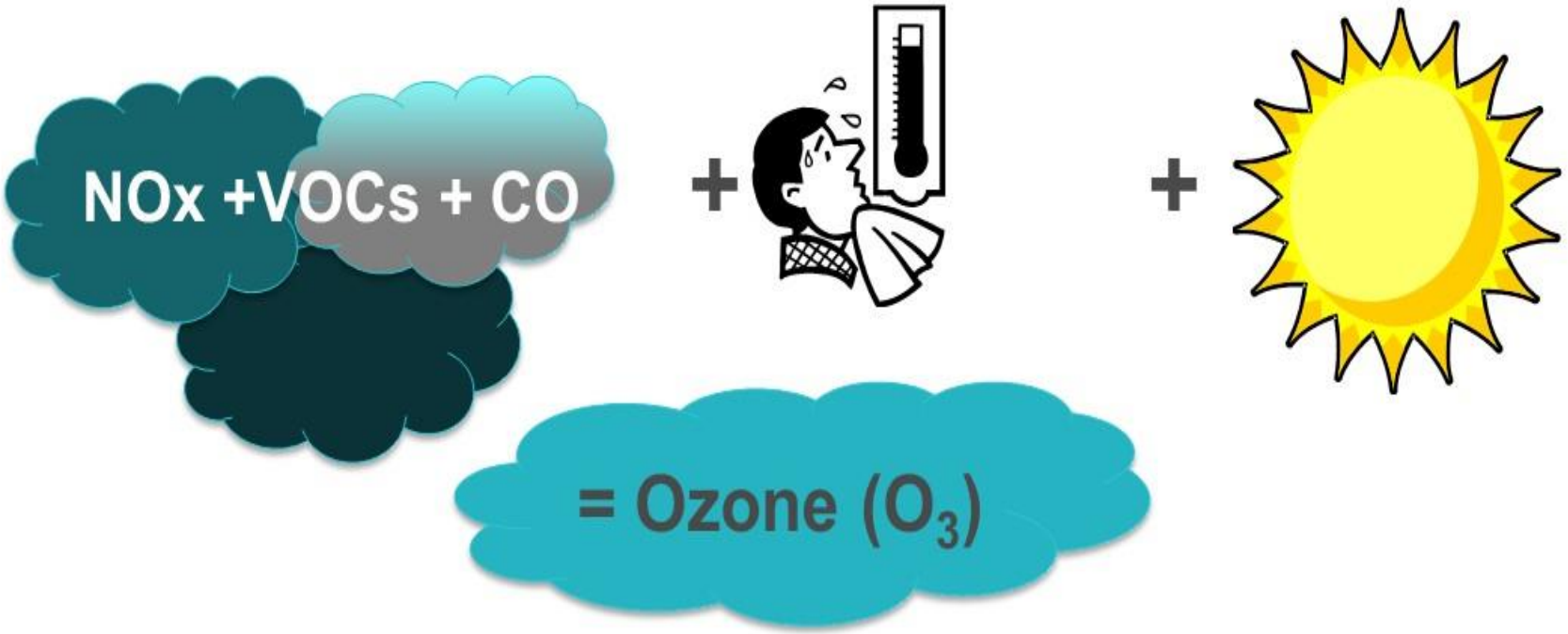
- **Globally* = 6.1 million death from air pollution (12% of global deaths in 2016)**
  - **✓4.1 million = outdoor or ambient air pollution**
  - **✓2.6 millions = indoor fires and heat**

**University of Washington's Institute for Health Metrics and Evaluation*

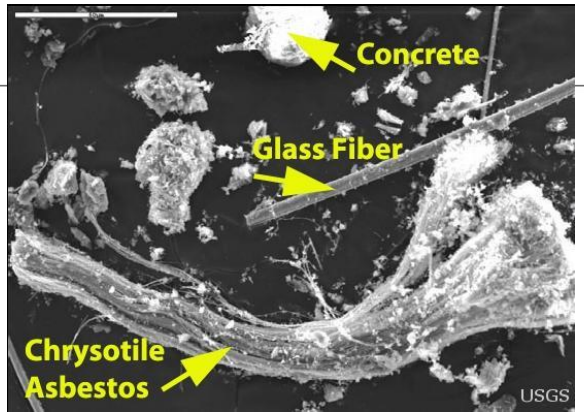
WHAT IS OZONE?

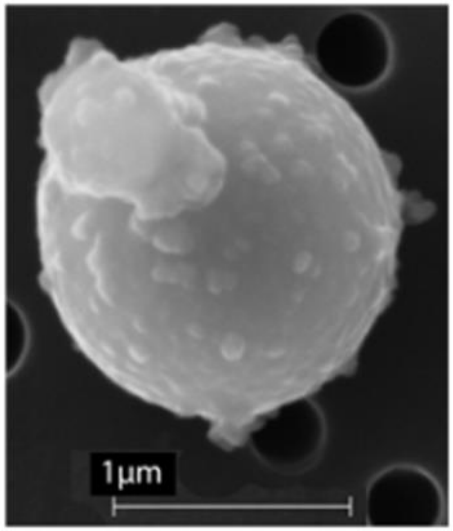
Ozone is a gas, sometimes called smog.

It is created in the atmosphere.

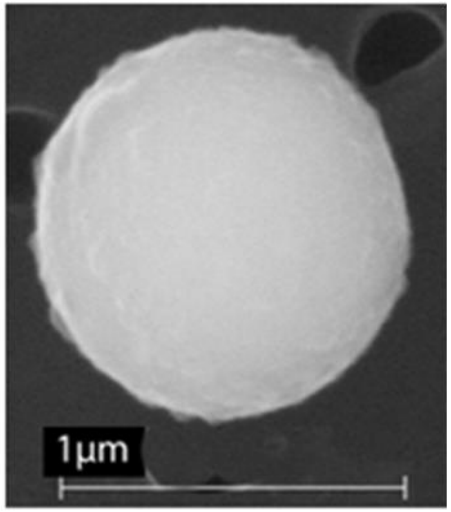


PARTICULATE MATTER

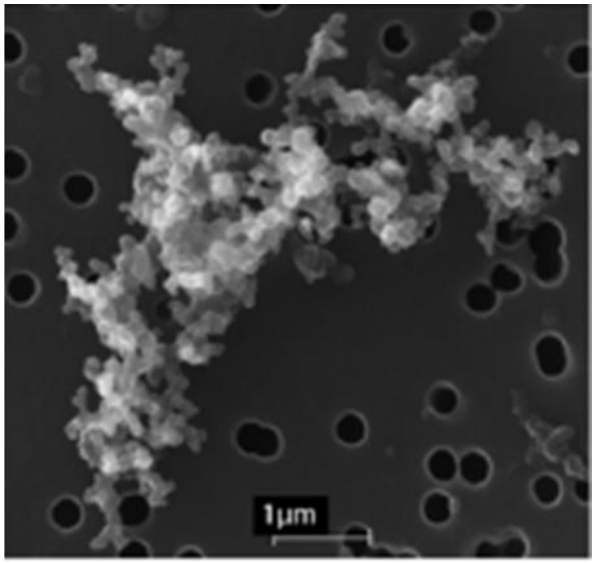




From a coal-fired power plant



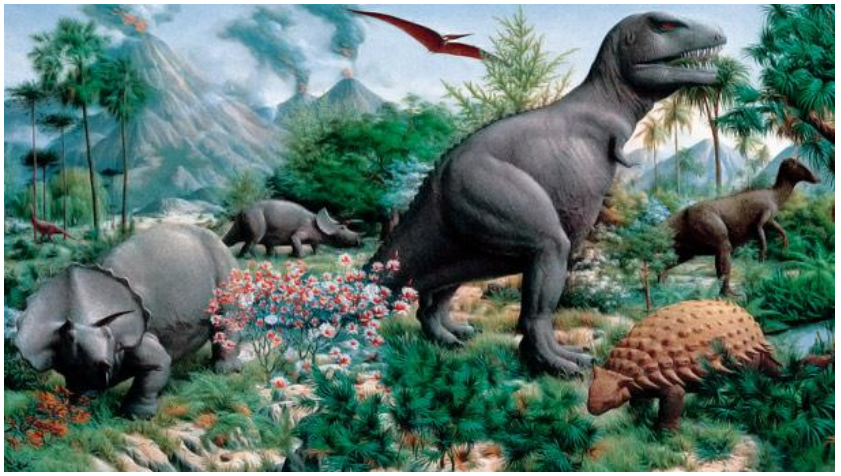
From a steel manufacturing plant

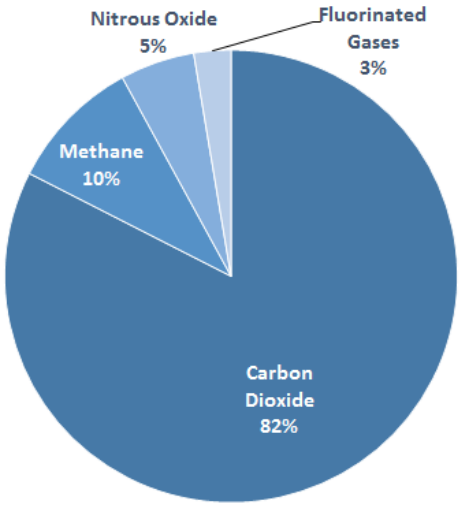


Carbon soot from a diesel engine—has lots of tiny particles

CLIMATE CHANGE & GREENHOUSE GASES

- **Carbon dioxide**
  burning of fossil fuels
  (coal, natural gas,
  & petroleum fuels)
- Result of chemical reactions (**mfg of cement**)
- Usually removed by plants as a part of biological carbon cycle
  (**except when in excess**)

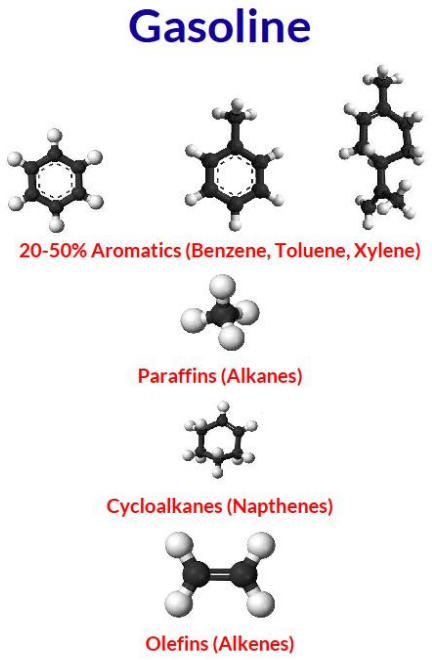


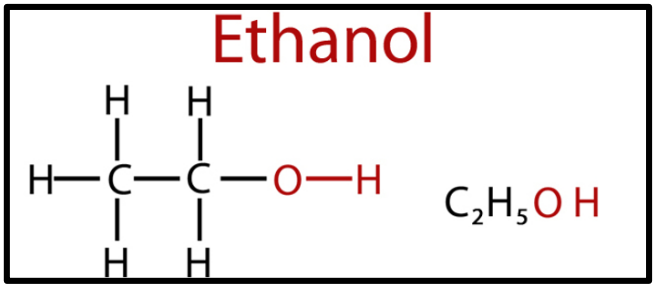


RISKS FROM TOXIC COMPONENTS

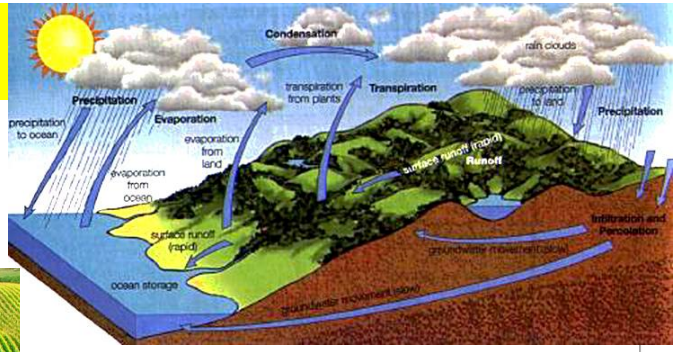
- Mixture of over 200 + Chemicals varies raw material & refinery process
- **BENZENE Group A: "Human Carcinogen" (**45% – 25%)

  Sufficient evidence from epidemiologic studies to support cause and effect
- Toxic at low concentrations
- Persistent, Bioaccumulative, Toxic
- Travels in groundwater (causes groundwater contamination
- Oil exploration/refining/spills (massive, tremendous impact)





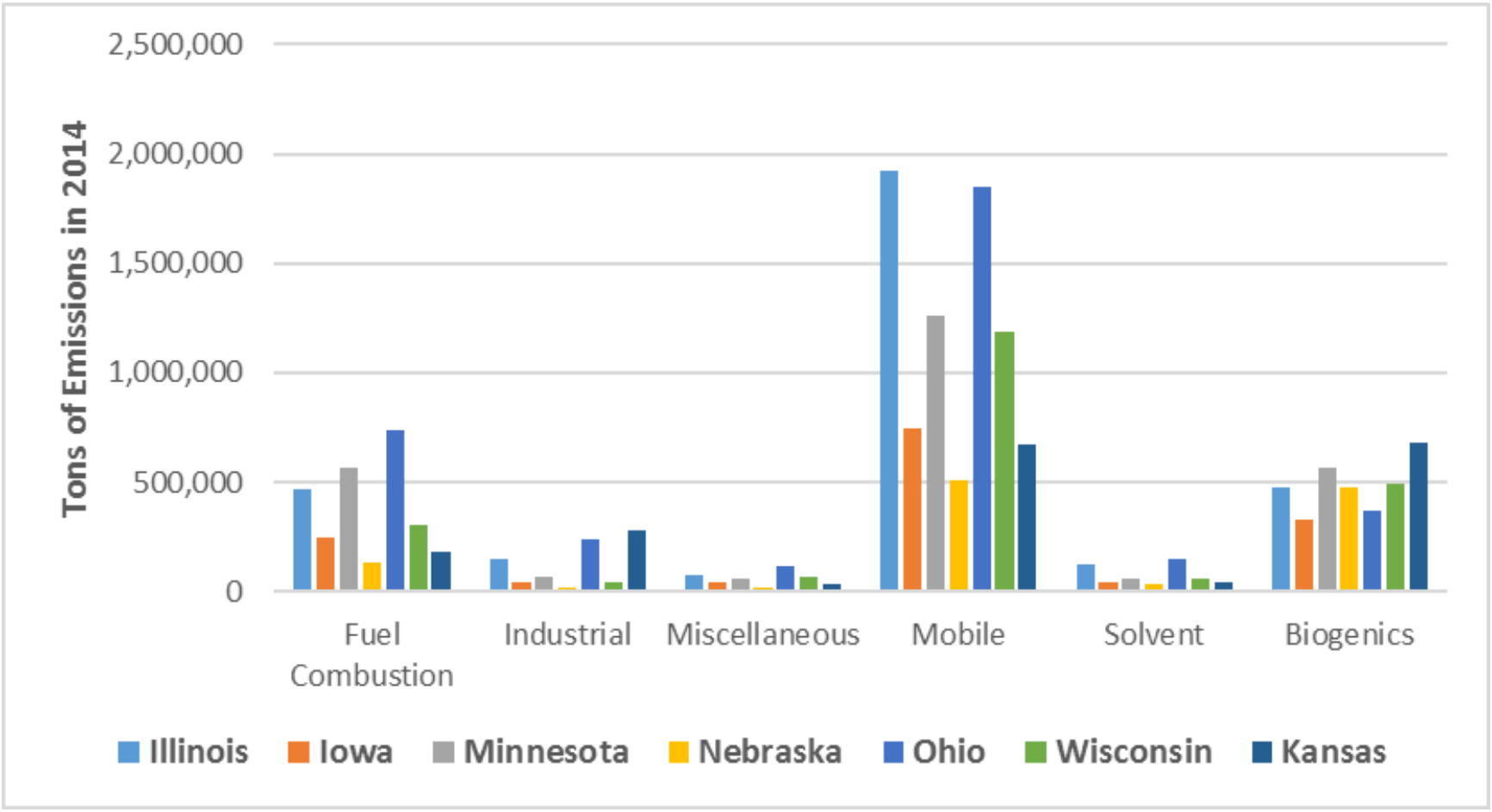
OTHER ENVIRONMENTAL EFFECTS



- Haze & smog
- Cloud formation & precipitation
- Water acidity
- **Damage to crops**
- Effects on ecosystems
- Corrosion and damage to materials/buildings
- Injury to vegetation
- Accelerates aging of rubber materials, dye fading and paint erosion (at low levels long duration)


MOBILE SOURCES

AIR QUALITY IN MIDWEST REGION



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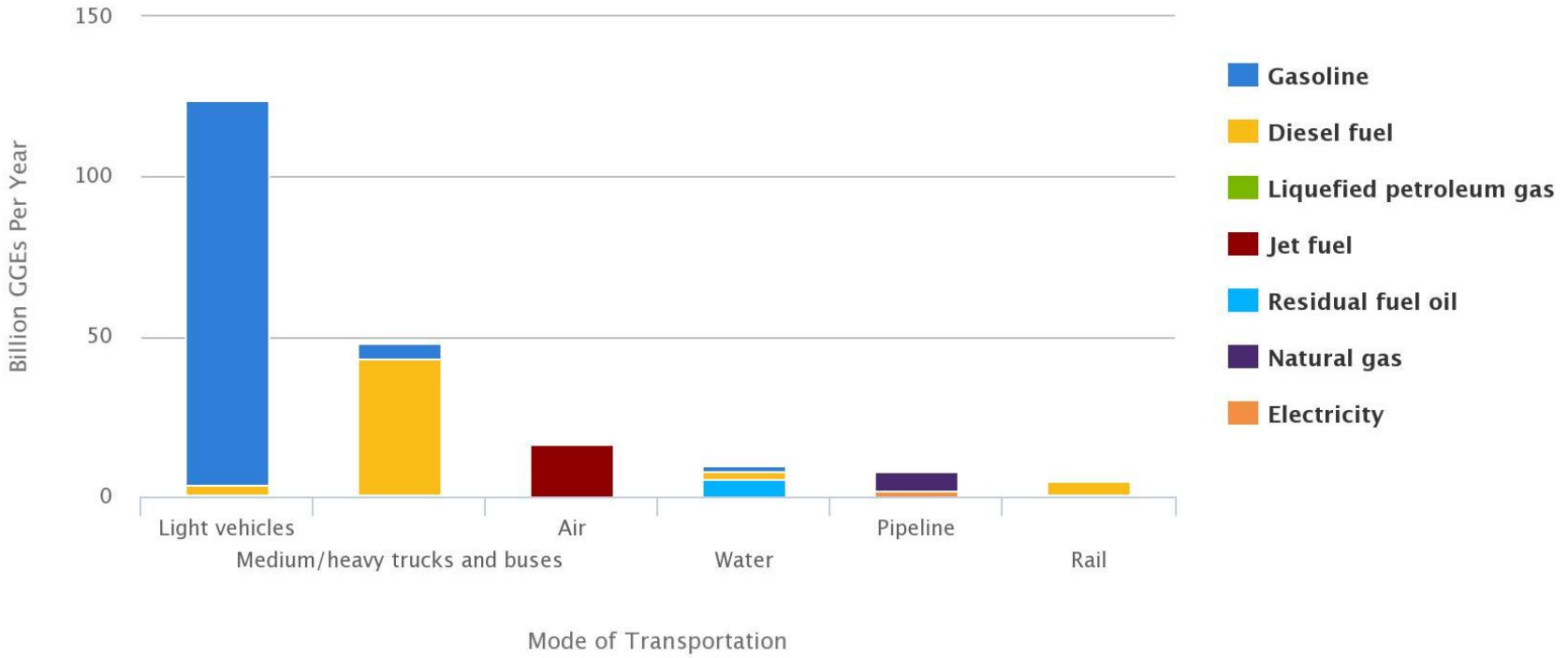
TRANSPORTATION ENERGY USE BY MODE AND FUEL TYPE IN THE U.S.



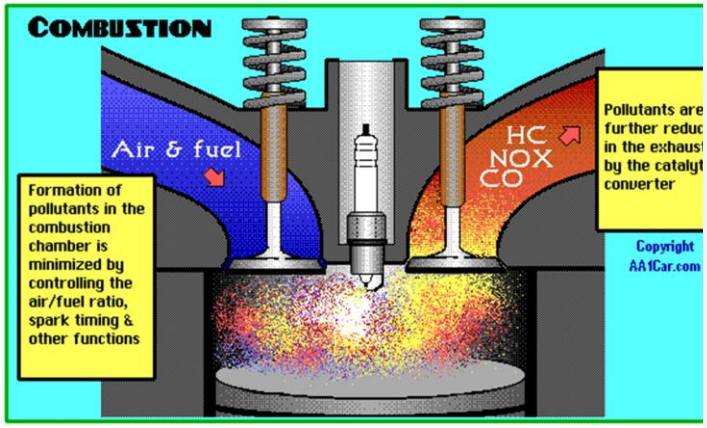
- A new vehicle today is up to 95% percent cleaner than a new vehicle in 1970.
- By 2020, mobile sources are projected to account for up to 50% of the NOx emissions, and substantial hydrocarbon and PM emissions.

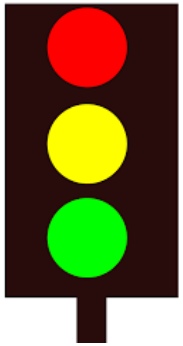
MOBILE SOURCE EMISSIONS

Engine operation

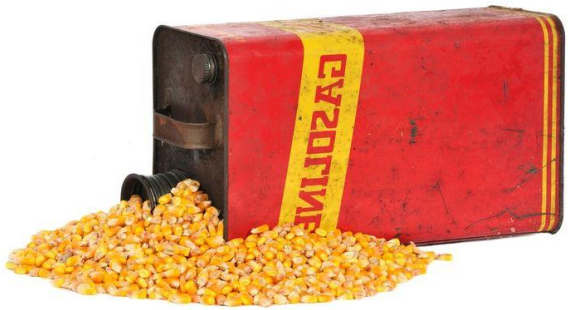
Fuel components

- Exhaust emissions
- Evaporative emissions (hot days>cold days)
- Trip emissions
- Refueling emissions





REFORMULATED GASOLINE

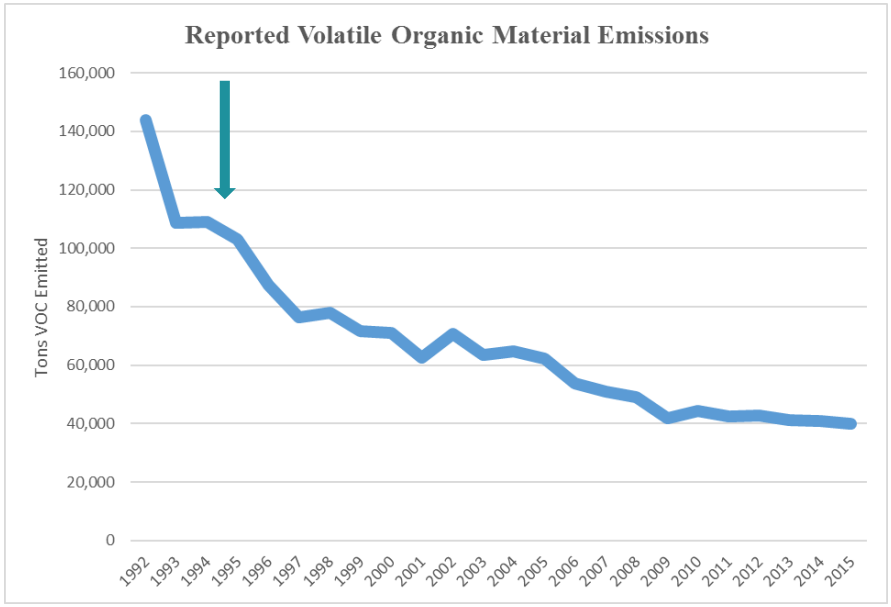


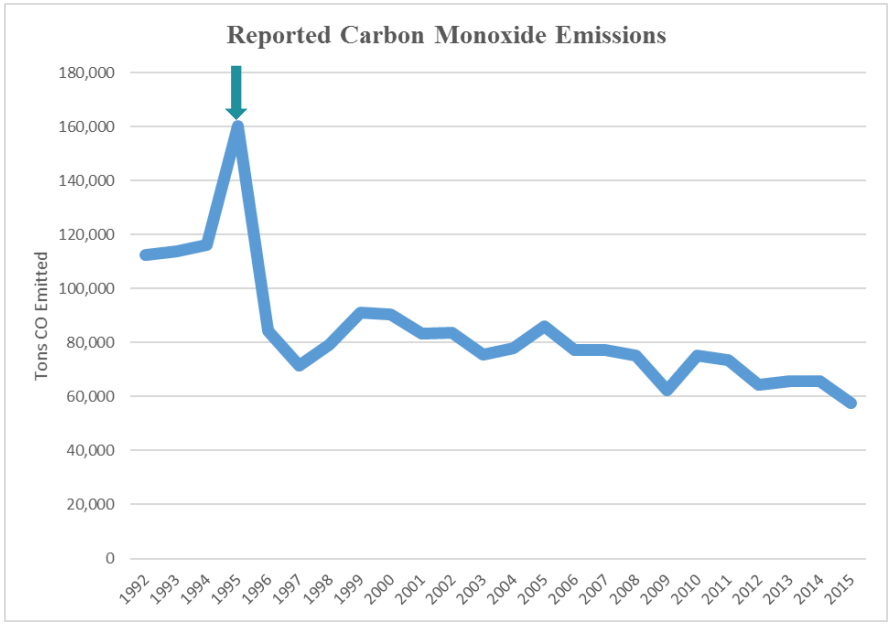
- Gasoline w/ additional refinery processing
- Blended at the refinery to burn more cleanly
- Required in high smog areas
- Has reduced evaporation properties
- Requires an oxygenate to improve combustion
- Midwest started using 10% ethanol in Chicago
- 10% ethanol in 95% of all gas in U.S.
- Less benzene by 43%

AIRQUALITY DATA

- Air pollution monitors
- Point source monitoring
- Modeling studies (other agencies)

CONTINUOUS AIR QUALITY MONITORING IN ILLINOIS





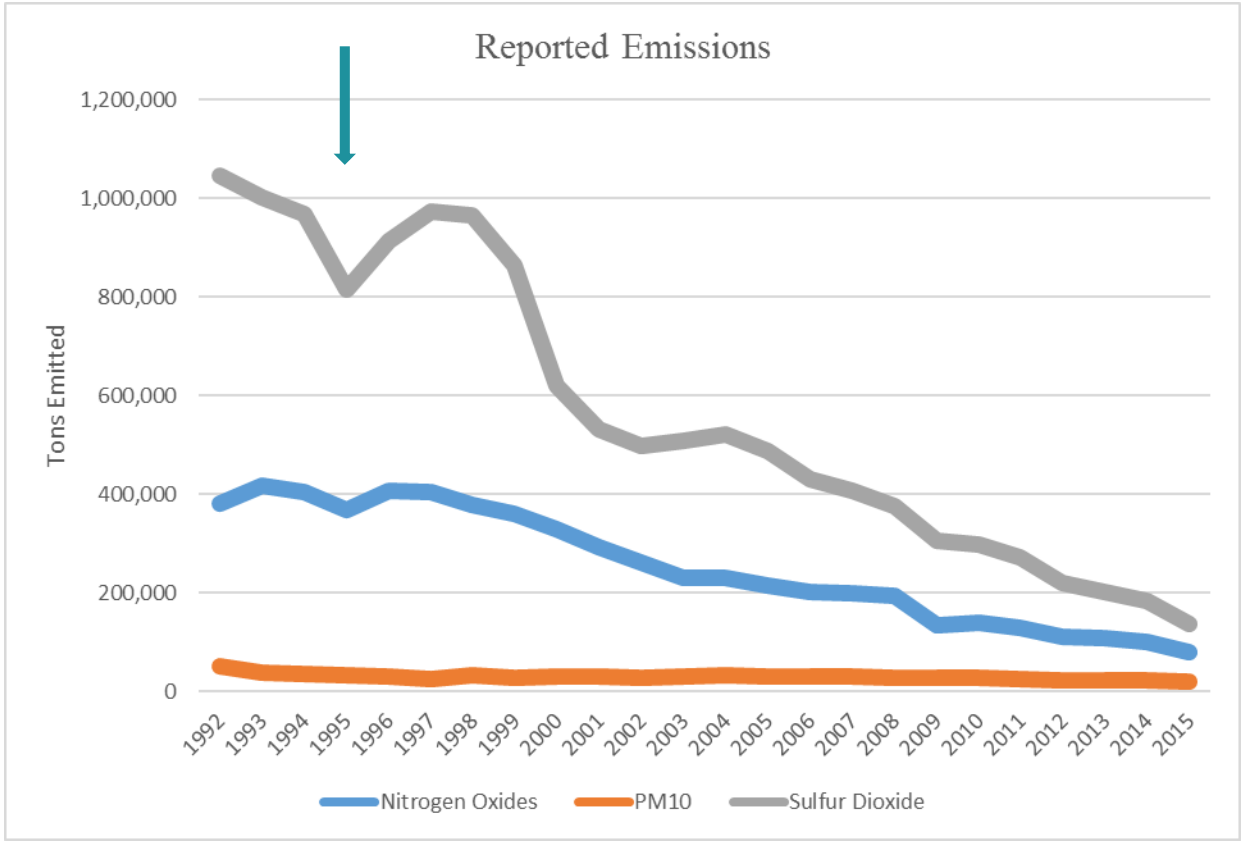
Reformulated Gas in 1995

72% Decrease in VOCs

64% Decrease in CO

- Continuous monitoring at 64 monitoring sites with more than 140 instruments
- Point source monitoring at 6400 sites

Reformulated Gas in 1995



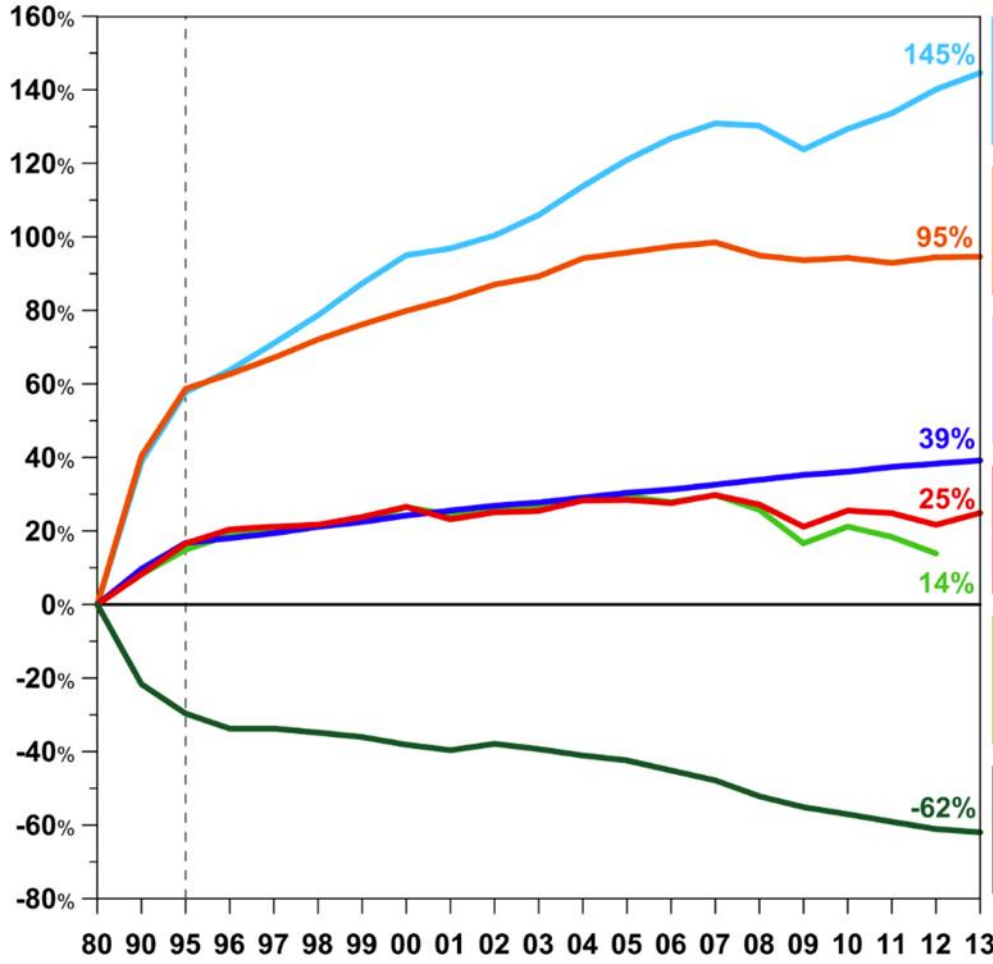
87% Decrease in SO2

81% Decrease in NOx

60% Decrease in PM10

With the removal of lead from gasoline, there is almost no lead in either the air or water

CLEAN AIR ACT PROGRESS




Gross Domestic Product


Vehicle Miles Traveled


Population


Energy Consumption


CO_2 Emissions


Aggregate Emissions (Six Common Pollutants)

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INTERNATIONAL OUTREACH

- Amsterdam
- China
- Taiwan
- India
- Mexico
- Columbia

WHY THE AMERICAN LUNG ASSOCIATION IS INVOLVED

- To work in area of most harm (mobile sources)
- To reduce air emissions & promote good lung health
- Ethanol blended fuel
  - ✓Renewable – sustainable fuel
  - ✓Non toxic, water soluble & biodegradable (all media)
  - ✓Positive environmental benefits
  - ✓No environmental harm from accidental releases
  - ✓No environmental harm compared to oil exploration or natural gas drilling

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