

CLEAN AIR ACT 101

BASICS OF THE CLEAN AIR ACT

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Clean Air Act 101

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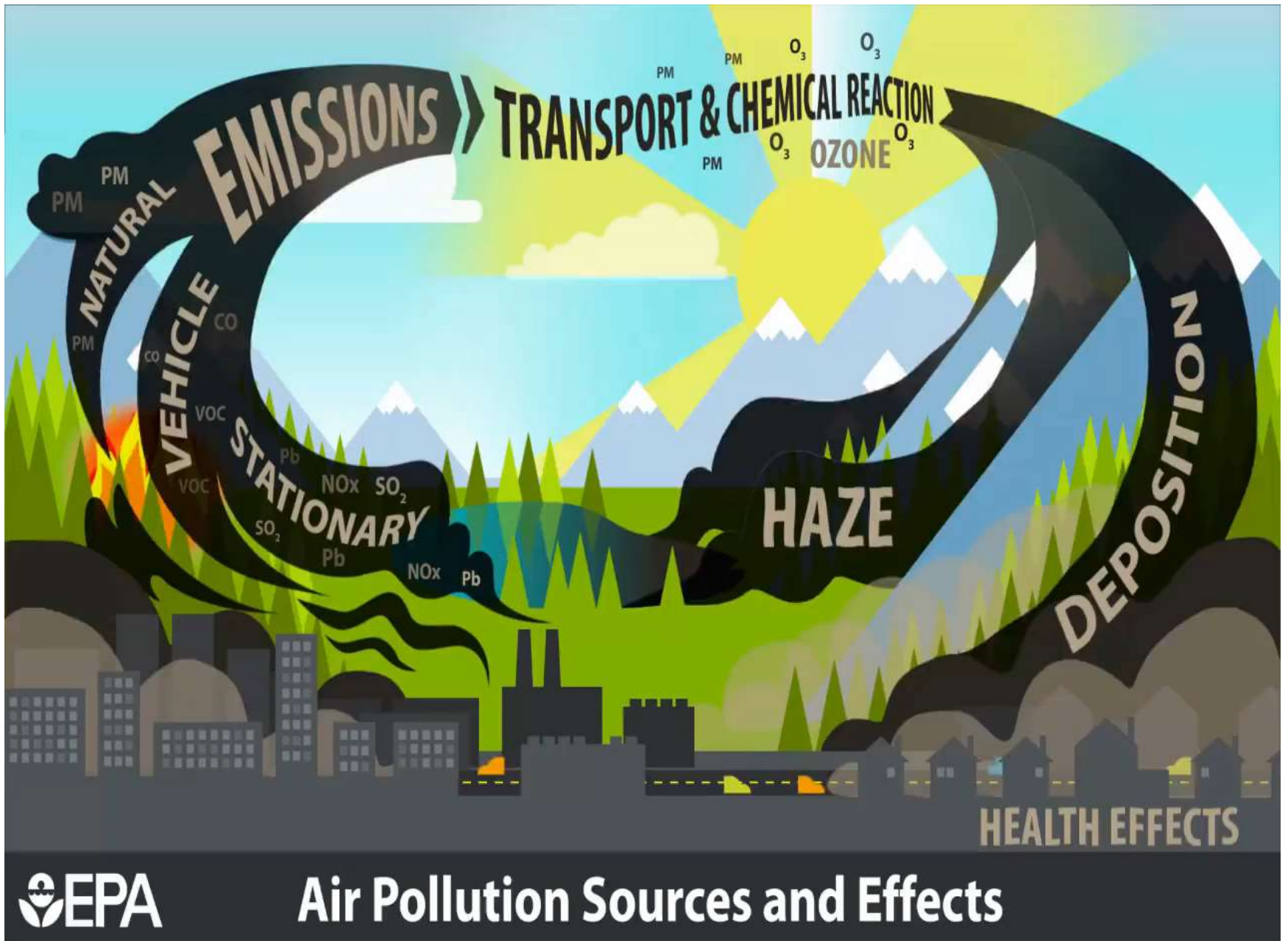
- ❑ Air Pollution Basics
- ❑ Clean Air Act Overview
- ❑ Title 1 Stationary Sources
- ❑ Title 2 Mobile Source
- ❑ Title 4 Acid Rain
- ❑ Title 5 Permits
- ❑ Clean Air Act Results



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Air Pollution Basics





Clean Air Act Tools

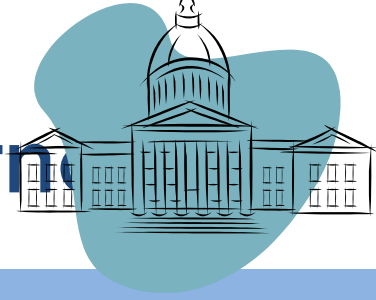
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We have a variety of tools to reach the goals set out in the Clean Air Act:

- **Rules** that set national, regional/state, or local standards for types of sources
- **Permits** for specific sources
- **Enforcement** of rules and permit requirements
- Voluntary programs that provide incentives to reduce pollution
- Collect and share information with the public, states, and others
 - ▣ monitoring data
 - ▣ public education



Air Quality Index (AQI) Values	Levels of Health Concern
0 to 50	Good
51-100	Moderate
101-150	Unhealthy for Sensitive Groups
151-200	Unhealthy
201-300	Very Unhealthy
301 to 500	Hazardous



Federal and State/Local Partners

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The Clean Air Act establishes partnership between federal and state governments.

▣ Federal role:

- Identify air pollutants, set standards, and review and revise standards regularly
- Develop standard methods for measuring pollution in the air and conduct other research
- Review state plans and rules for reducing pollution
- Provide funding, general and project-specific

▣ State, local role:

- Monitor the air
- Issue construction and operation permits
- Incorporate federal rules into state law
- Inspect and enforce requirements of rules and permits
- Develop plans for areas not meeting health standards

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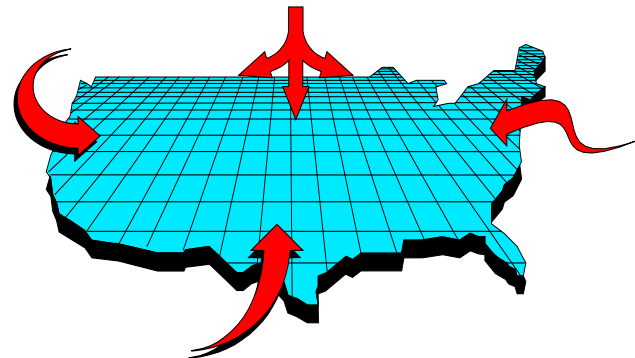
CAA Subchapter I: Programs and Activities

Stationary Source Control



National Air Quality Standards

- EPA sets National Ambient Air Quality Standards (NAAQS) for six common pollutants: particulate matter (PM), ozone (O₃), sulfur dioxide (SO₂), carbon monoxide (CO), lead (Pb), and nitrogen dioxide (NO₂)
- Standards specify concentration levels intended to protect public health
- CAA requires each standard be reviewed every 5 years.
- The EPA established geographic regions to designate the air quality status with respect to NAAQSs. These regions are pollutant specific.



State Implementation Plans (SIPs)

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- ❑ States develop SIPs to meet the NAAQS
- ❑ The SIP is the federally-enforceable plan for each State which identifies how that State will attain and/or maintain the NAAQS.
- ❑ Establish a mix of emission limits and other measures to control each criteria pollutant
- ❑ A specific plan for each nonattainment area.
- ❑ States submit SIPs and NAAQS attainment demonstrations for EPA approval
- ❑ EPA must formally approve or disapprove a SIP



New Source Review (NSR)

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- NSR applies to new major sources or major modifications at existing sources for pollutants.
 - Control requirements depend on attainment status
 - Attainment: Prevention of Significant Deterioration
 - Best Achievable Control Technology (BACT)
 - Air quality analysis
 - Nonattainment NSR
 - Lowest Achievable Emission Rate (LAER)
 - Offsets ratioed to result in net reductions



Section 112 – Air Toxics

- 1970 CAA Air Toxics Provisions
 - ▣ Required EPA to list and regulate air toxics based on risks they posed: safe with an ample margin of safety
 - ▣ In 20 years, EPA listed 8 toxics and regulated 7
 - I wrote one of them
- 1990 Amendments changed approach
 - ▣ Lists more than 180 air toxics of concern
 - ▣ Requires EPA to identify and regulate major sources of toxics
 - ▣ Requires EPA to reduce emissions through technology-based standards
 - ▣ Requires EPA to evaluate the remaining risks at sources and set more stringent standards if necessary

National Emission Standards for Hazardous Air Pollutants

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- NESHAPs are nationally uniform standards established to control air toxics:
 - ▣ Applicable to categories of emission sources rather than to specific pollutants emitted
- Sources of Hazardous Air Pollutants (HAPs):
 - ▣ “Major sources”
 - ▣ “Area sources”



MACT Standards

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- Major Sources get MACT Standards
- MACT = “Average emission limitation achieved by the best performing 12% of existing sources”
- Measures to implement MACT include:
 - Pollution controls
 - Process changes
 - Materials substitution
 - Operator training and certification



Other Related Air Toxics Efforts

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- ❑ National Air Toxics Assessment to estimate emissions and exposures and to characterize risk levels across the U.S.
- ❑ Integrated Urban Air Toxics Strategy
- ❑ Community based projects
- ❑ Mobile sources, fuels/fuel additives, indoor air
- ❑ Risk management programs



Community Based Programs: Community Action for a Renewed Environment

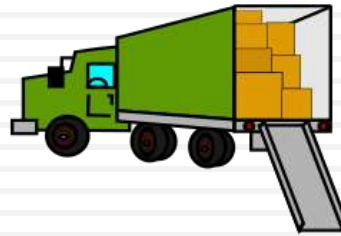
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- ❑ I led the development of the CARE program.
- ❑ CARE was an environmental justice program created to build partnerships to help communities understand and reduce risks from all sources of toxics.
- ❑ CARE brought together community stakeholders - local businesses, residents and local governments - in a collaborative process to address local environmental risks.
- ❑ CARE helped communities gain an understanding of all potential sources of exposure to toxic pollutants building the capacity of communities to take effective actions to address environmental problems at the local level.
- ❑ In addition to grant funding, the CARE program also provided communities with tools, technical assistance and other support in implementing local solutions that reduce exposures to toxic pollutants.
- ❑ CARE ended but changed the model of EPA community programs from “community based” to “community driven”



CAA Subchapter II: Emission Standards for Moving Sources

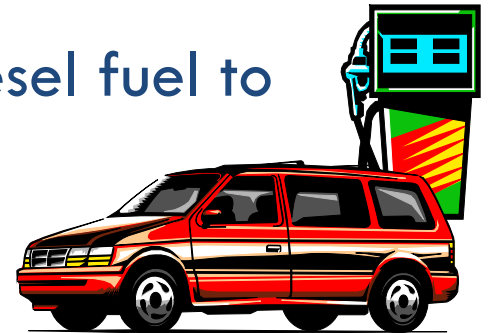
Mobile Source Control



Title II - Mobile Sources

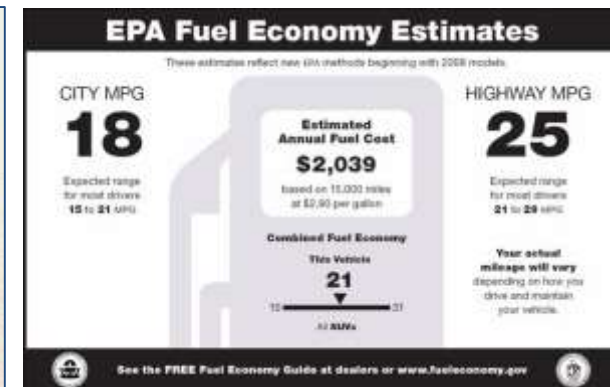
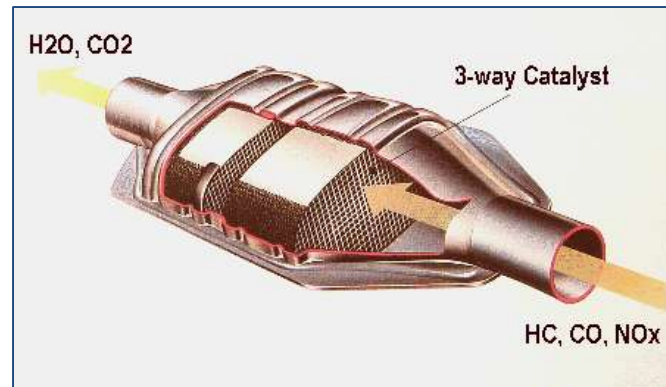
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- Title II reduces air pollution from mobile sources by:
 - Stricter emission standards
 - On-road
 - Off-road
 - Diesel
 - Locomotives
 - Stricter standards on gasoline and diesel fuel to reduce emissions
 - Programs to encourage and force the development of “clean” fuel vehicles



Mobile Sources

- Ways to control mobile sources
 - cleaner fuels and engines
 - tailpipe controls
 - higher fuel efficiency



Major Title II Provisions

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- Set emission standards for new vehicles and engines (CAA sections 202, 211)
- Create test procedures and protocols to evaluate performance against the standards (CAA section 206)
- Issue certificates (CAA section 206) and register fuels (CAA section 211) prior to their introduction into commerce
- Require manufacturers to recall vehicles and engines that do not comply (CAA section 207)
- Take enforcement action when regulated parties violate the law (CAA section 205)

Controls in Other Mobile Sources

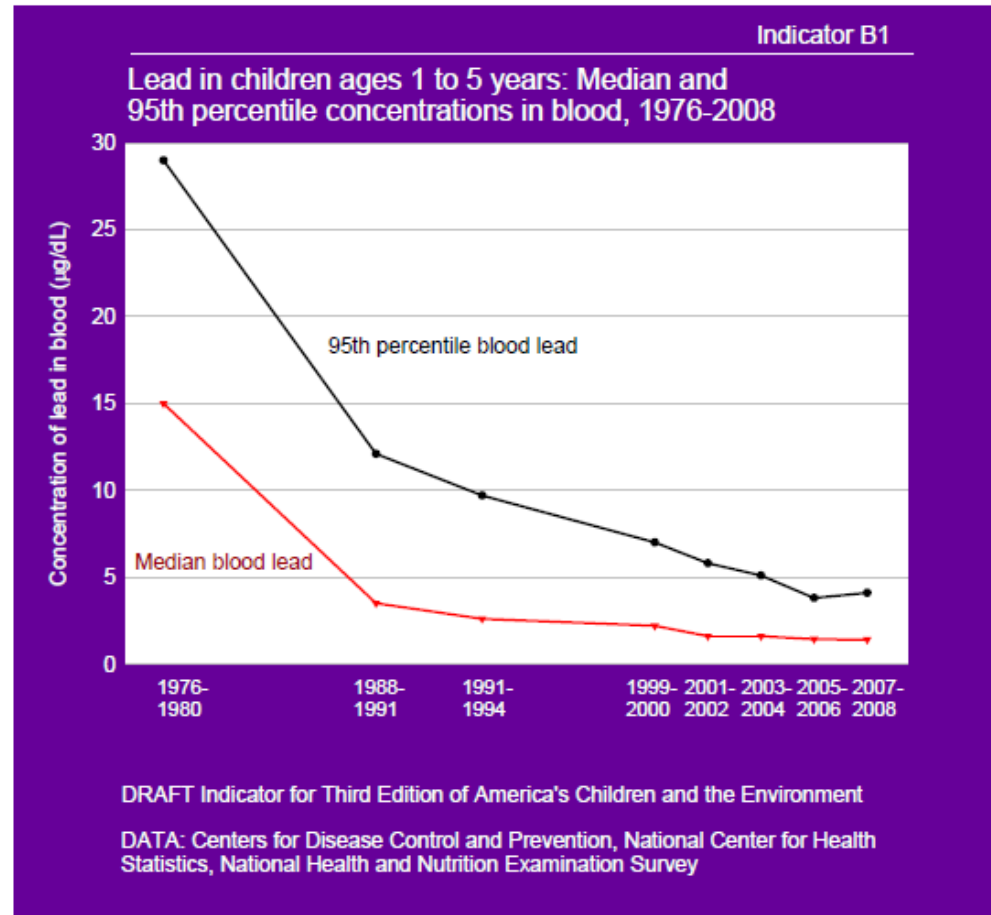
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- New heavy-duty trucks and buses are roughly 99 percent cleaner than 1970 models.
 - ▣ In August 2016, EPA and NHTSA set standards for medium- and heavy-duty vehicles that will improve fuel efficiency and cut carbon pollution
- Starting in the 2014 model year, locomotives are 90 percent cleaner than pre-regulation locomotives.
- New commercial marine vessels (non-ocean-going) are 90 percent cleaner for particle emissions than in 1970.

Success Story: Lead Out of Gasoline

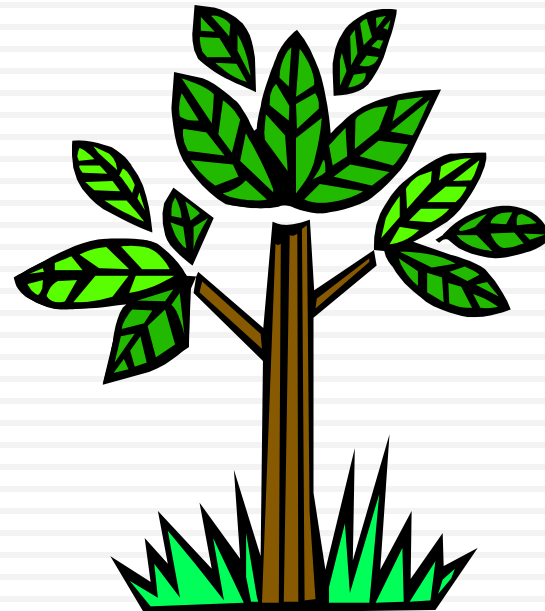
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- From 1980 to 2005, national average lead concentrations down **96%** because of EPA standards
- In 1978, about **88%** of children ages 1 to 5 years (about 13.5 million children) had blood lead levels at or greater than 10 $\mu\text{g}/\text{dL}$
- By 2007–2008, this number had declined to about **1%** (about 250,000 children)



CAA Subchapter IV: Acid Deposition Control

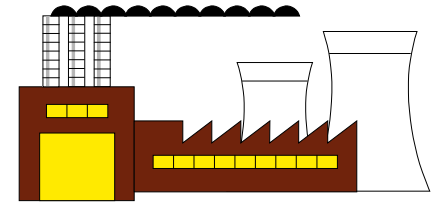
Acid Rain



Acid Rain Control Program

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- Acid rain program with specific requirements for reducing:
 - Sulfur dioxide emissions
 - Nitrogen oxides emissions
 - Using a new market-based “Cap and Trade” system
 - Allocates “emission allowances” to power plants
 - Requirements for compliance include:
 - Reduce emissions, or
 - Acquire allowances from other plants

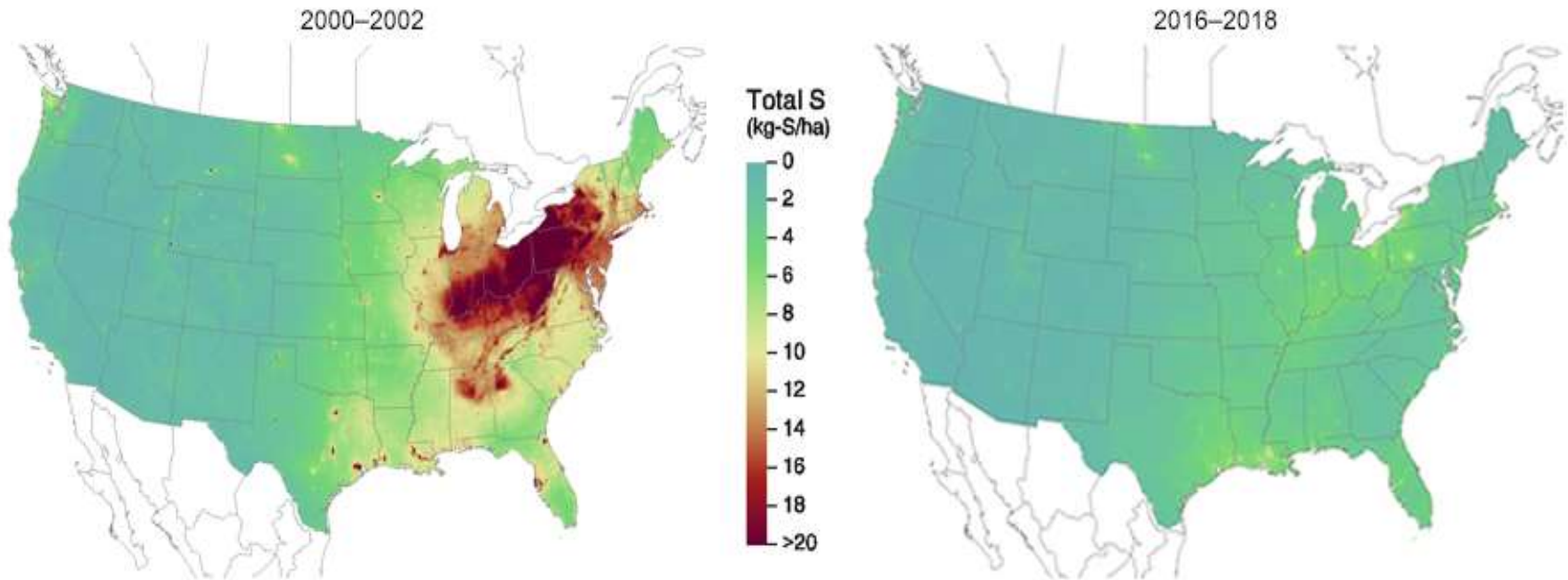


Success Story: Significant Reductions in Acid Rain

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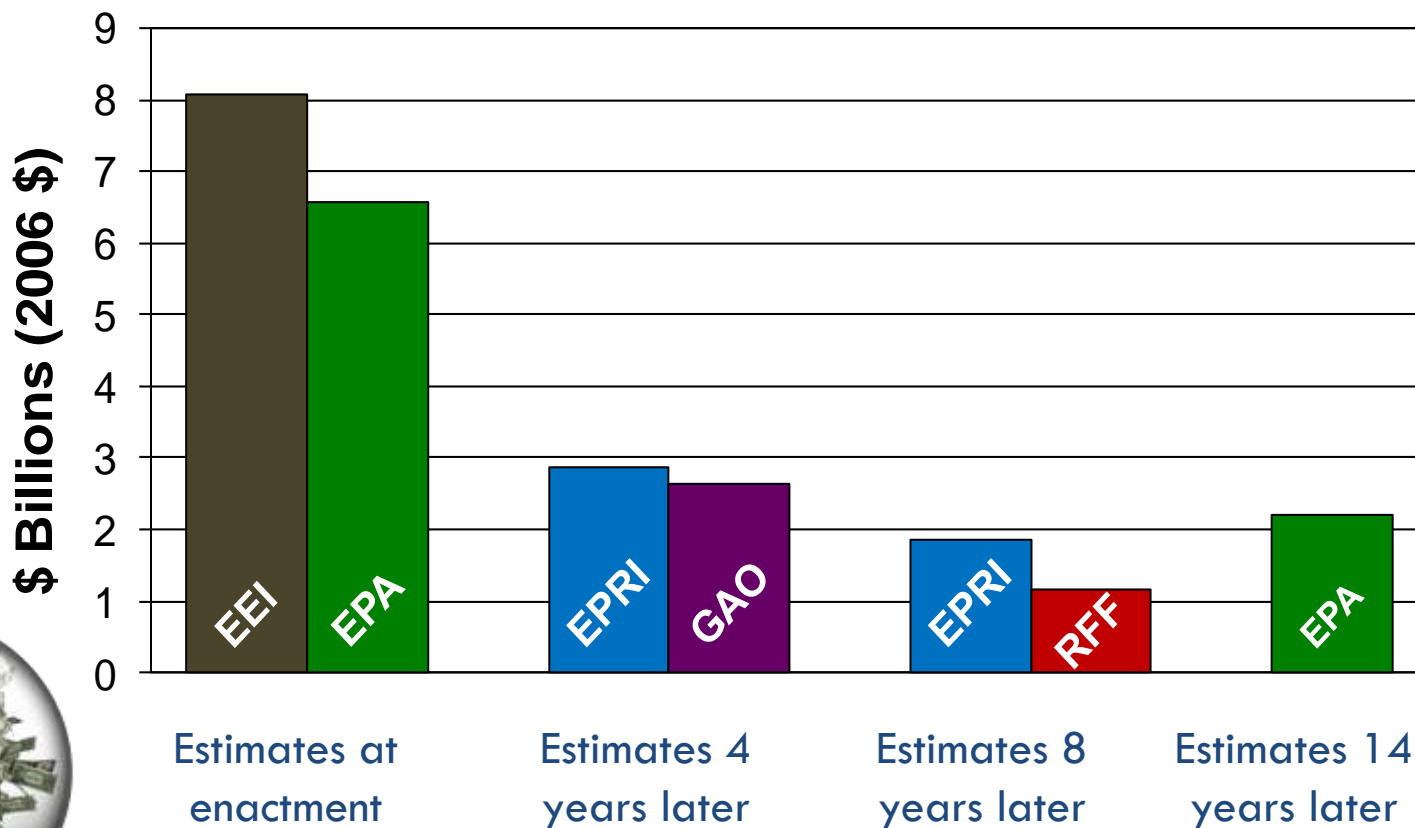
- Reducing acid rain has significantly reduced damage to water quality in lakes and streams, and improved the health of ecosystems and forests.
- Between the 1989 to 1991 and 2009 to 2011 observation periods, wet deposition of sulfate (which causes acidification) decreased by more than 55 percent on average across the eastern United States.

Three-Year Average of Total Sulfur Deposition



Costs of the Acid Rain SO₂ Cap-and-Trade Program are Much Lower than Projected

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Subchapter V Permits

Air Permits for Major Stationary Sources

Title V - Operating Permits

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- Title V
 - Establishes an expanded permitting program.
 - Combines all requirements for a source in one permit
 - Major sources
 - HAP sources and criteria pollutants
 - Delegated to states and tribes
 - New permit program is fee-based
 - Significant fees/revenues
 - Federal facilities are subject to any fee or charge imposed by the State or local agency to defray the costs of its regulatory pollutant



Title V - Operating Permits

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- Each permit must include:
 - Enforceable emission limitations and standards
 - Schedule of compliance
 - Requirements for submission of monitoring data



Clean Air Act Results

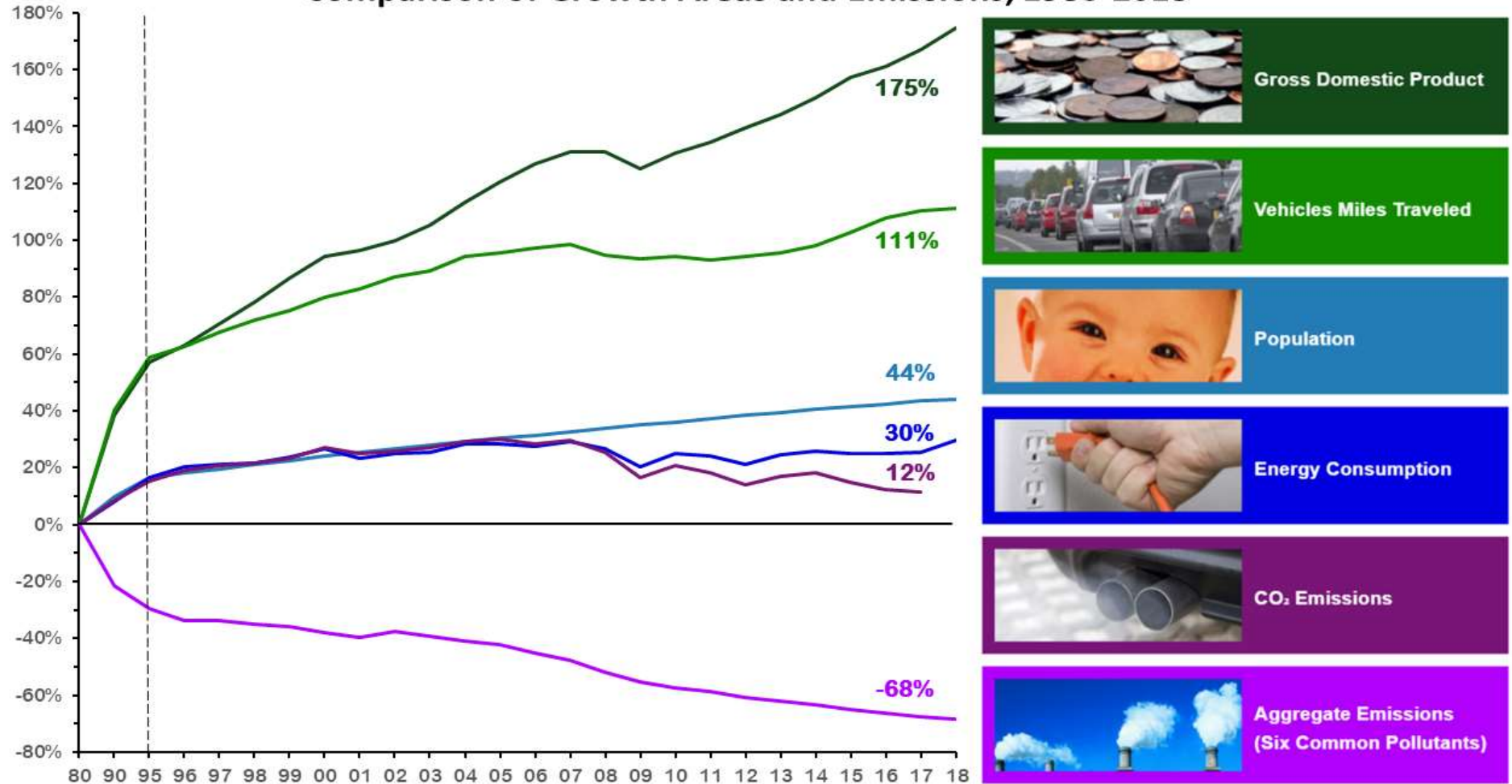


Progress in a Nutshell 1970-2018

Pollution Down While Growth Continues

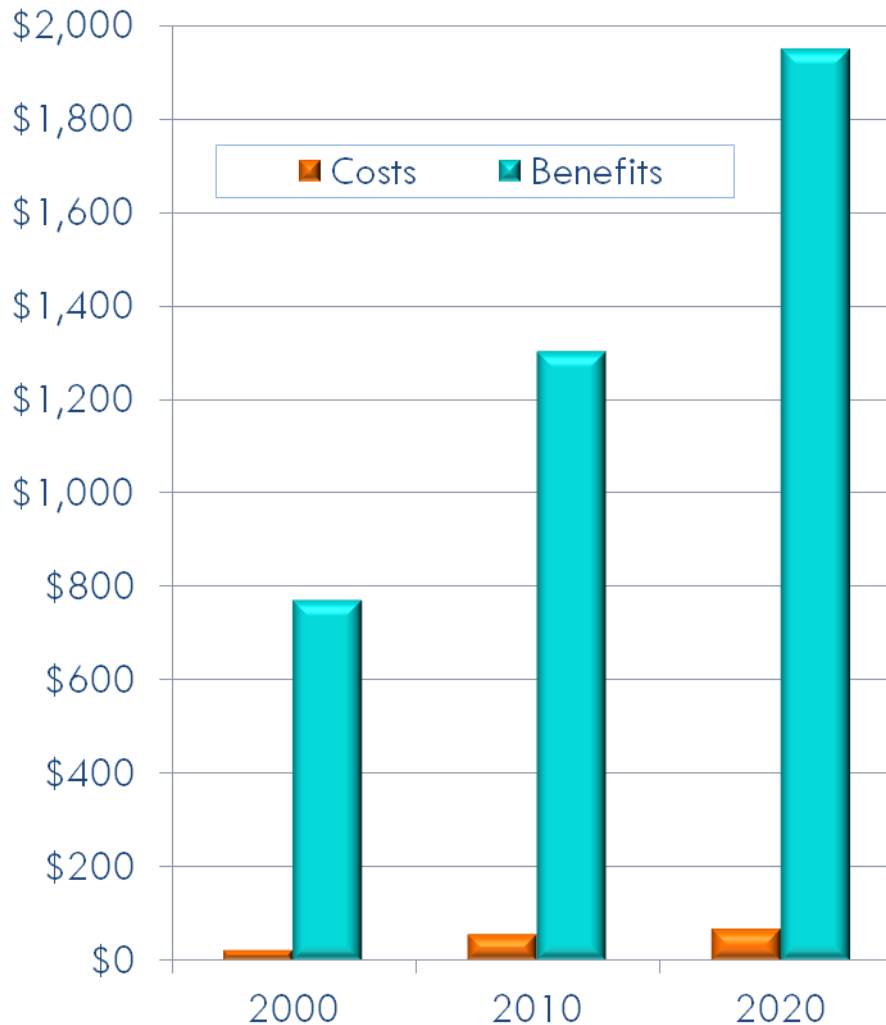
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Comparison of Growth Areas and Emissions, 1980-2018



Benefits of Clean Air Have Greatly Outweighed the Costs

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Primary Central
Estimates of Direct
Benefits and Direct Costs

(in billions of 2006 year
value dollars)

Economic modeling shows that savings from reduced medical costs and a reduction in lost workdays results in a **net increase to GDP** even when the costs of compliance are taken into account