

# Basics of the Clean Air Act

Environmental Law Institute Summer School  
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Environmental / U.S.



# Introduction to Air Pollution—Criteria Pollutants

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Particulate matter (PM/PM<sub>10</sub>/PM<sub>2.5</sub>)



Sources

# Introduction to Air Pollution—Criteria Pollutants

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## Particulate matter (PM/PM<sub>10</sub>/PM<sub>2.5</sub>)



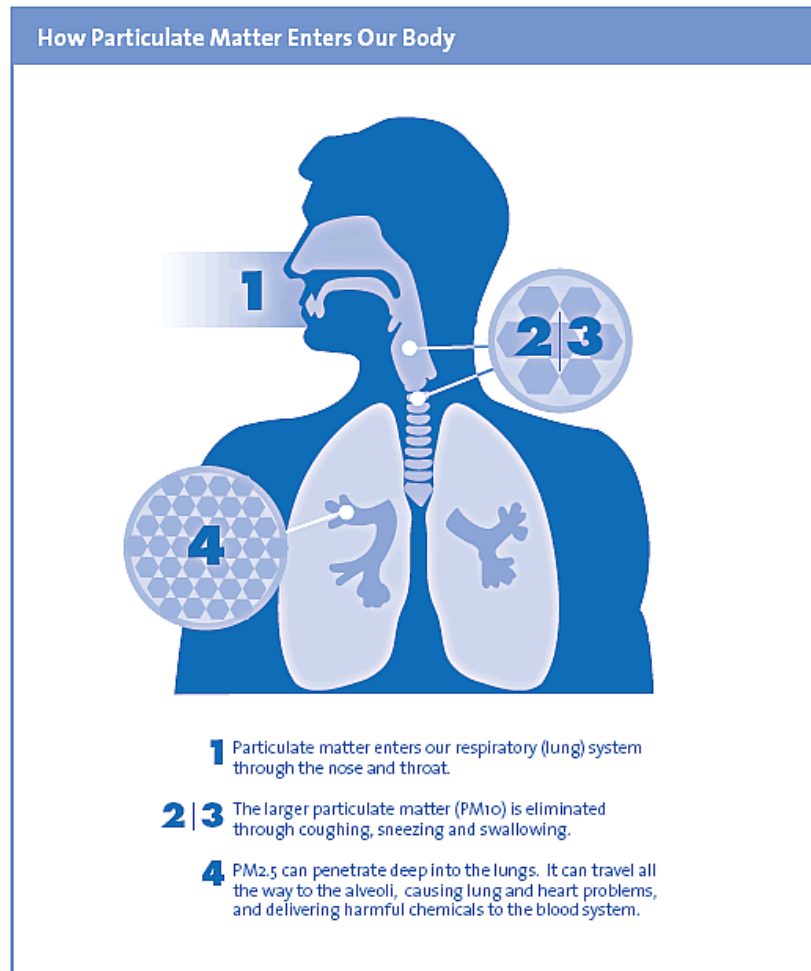
Source: Climate and Geohazards

## Environmental Effects

# Introduction to Air Pollution—Criteria Pollutants

## Particulate matter (PM/PM<sub>10</sub>/PM<sub>2.5</sub>)

Health  
Effects



# Introduction to Air Pollution—Criteria Pollutants

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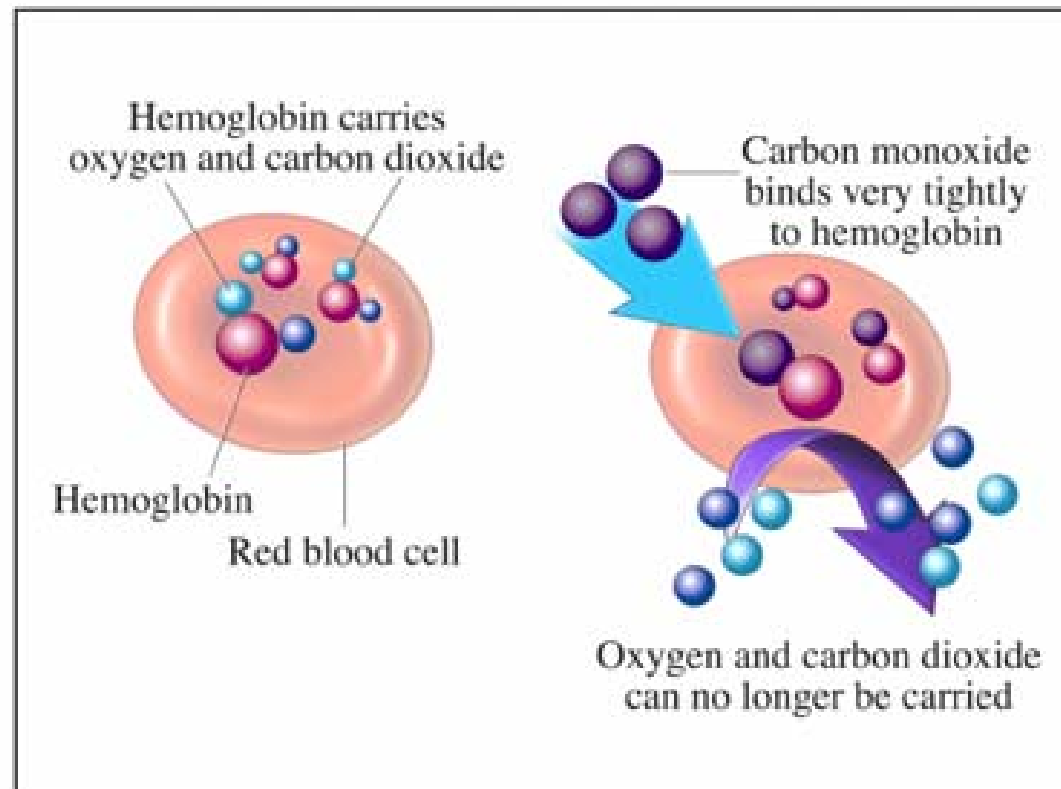
## Carbon monoxide (CO)



Sources

# Introduction to Air Pollution—Criteria Pollutants

## Carbon monoxide (CO)



Source: UVa Health

## Health Effects



# Introduction to Air Pollution—Criteria Pollutants

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Nitrogen dioxide (NO<sub>2</sub>) and Ozone (O<sub>3</sub>)



# Introduction to Air Pollution—Criteria Pollutants

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Nitrogen dioxide (NO<sub>2</sub>) and Ozone (O<sub>3</sub>)



**Environmental Effects**



# Introduction to Air Pollution—Criteria Pollutants

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Nitrogen dioxide (NO<sub>2</sub>) and Ozone (O<sub>3</sub>)



# Introduction to Air Pollution—Criteria Pollutants

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Sulfur dioxide (SO<sub>2</sub>)





# Introduction to Air Pollution—Criteria Pollutants

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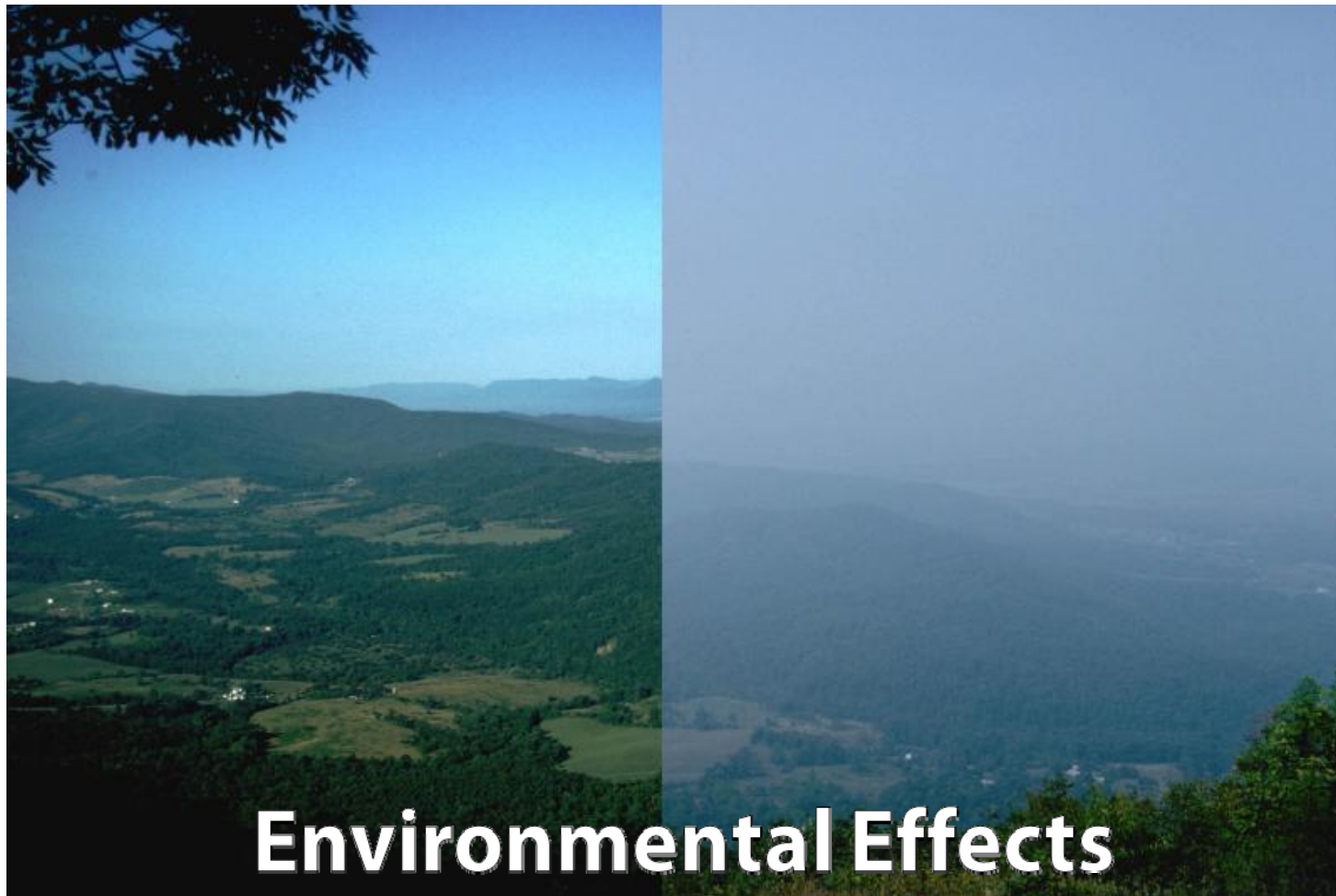
Sulfur dioxide (SO<sub>2</sub>)



# Introduction to Air Pollution—Criteria Pollutants

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Sulfur dioxide (SO<sub>2</sub>)





# Introduction to Air Pollution—Criteria Pollutants

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Sulfur dioxide (SO<sub>2</sub>)



**Health Effects**



# Introduction to Air Pollution—Criteria Pollutants

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## Lead



Sources

# Introduction to Air Pollution—Criteria Pollutants

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Lead



**Health Effects**

# National Ambient Air Quality Standards (NAAQS)

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- National numerical air quality standard for each “criteria pollutant” (designated in CAA § 107) adequate to protect public health and allowing an adequate margin of safety
- Standards are expressed as maximum acceptable mass (micrograms per cubic meter) for a period of time (e.g., 1 hour; 24 hours) or a concentration based limit (parts per million)
- Costs of control may not be considered when setting the NAAQS
- Can consider uncertain science and provide for margin of safety

# National Ambient Air Quality Standards (NAAQS)

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- Attainment/Nonattainment
- To have been met nationwide by 1975
- To be reviewed every five years, but often takes longer
- Primary and Secondary NAAQS
  - Primary standards provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly
  - Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, and vegetation

# National Ambient Air Quality Standards (NAAQS)

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m <sup>3</sup> (1)	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb (2)	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution Dec 14, 2012	PM <sub>2.5</sub>	primary	Annual	12 µg/m <sup>3</sup>	annual mean, averaged over 3 years
		secondary	Annual	15 µg/m <sup>3</sup>	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m <sup>3</sup>	98th percentile, averaged over 3 years
	PM <sub>10</sub>	primary and secondary	24-hour	150 µg/m <sup>3</sup>	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

as of October 2011



# Achieving NAAQS through Air Quality Planning

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- The basic geographical unit of air pollution control is the Air Quality Control Region (AQCR) (CAA § 107)
- Each state is to develop a State Implementation Plan (SIP) designed so that each AQCR attains and maintains the federally-set NAAQS (CAA § 110)
- Based on cooperative federalism principles

# Achieving NAAQS through Air Quality Planning

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- The states submit their SIPs to EPA for approval
- If the SIP meets the Section 110 requirements, EPA approves it
- If the SIP fails to meet the Section 110 requirements, EPA may approve it in part, or reject it and create a Federal Implementation Plan (FIP)
- EPA has one year to approve of a SIP, but that deadline may slip

# Achieving NAAQS through Air Quality Planning: Section 110

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- Enforceable emission limitations or other control measures, and schedules for compliance
- Source emission monitoring and reporting
- Enforcement provisions
- Collect air quality data
- Prohibit NAAQS violations in other states
- Prohibits sources from contributing to nonattainment or interfering with maintenance of NAAQS
- Periodically revise SIP

# NAAQS Enforcement Tools

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- Failure to submit an approvable SIP or failure to implement an approved SIP can result in:
  - Federal highway funding restrictions
  - Creation of a FIP and federal control of AQCR
  - Increased offsets
  - EPA refusal to approve construction permits

# Prevention of Significant Deterioration (PSD)

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- Applies to attainment areas
- AQCR designated as Class I, Class II, or Class III
- Designed to maintain attainment status by setting an “increment” above the current ambient concentrations of criteria pollutants that can be “consumed” by new emissions
- Requires preconstruction review of new/modified major sources
- Requires use of the Best Available Control Technology (“BACT”) for all pollutants emitted in a “significant” amount
- Requires air quality modeling and monitoring



# Best Available Control Technology (BACT)

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- Step 1 – Identify all control technologies
  - Don't have to consider options that "redefine" the source
- Step 2 – Eliminate technically infeasible options
  - Carbon, capture, and sequestration
- Step 3 – Rank remaining control technologies
- Step 4 – Evaluate most effective controls
  - Case-by-case consideration of energy, environmental, and economic impacts
- Step 5 – Select BACT

## Nonattainment Example: Ozone

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- Marginal nonattainment (§ 182(a)): Emission inventory; RACT; new source review; reformulated gasoline opt-in
- Moderate nonattainment (§ 182(b)): 15% reduction in emissions; Stage II vapor recovery; basic inspection & maintenance; NSR offset ratio
- Serious nonattainment (§ 182(c)): Enhanced monitoring; enhanced inspection & maintenance; clean-fuel vehicle program; vapor recovery; transportation controls; reformulated gasoline
- Severe/Extreme (§ 182(d-e)): Enhanced offsets; reduced vehicle miles traveled

# Concept Review: Proposed Ozone NAAQS

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- On November 25, 2014, EPA proposed new ozone NAAQS standards
- Proposing to set primary and secondary ozone NAAQS between 65 – 70 ppb
  - Also taking comment on whether it should retain current standard of 75 ppb
- EPA under a court-ordered deadline to issue final rule by October 1, 2015

# Concept Review: Proposed Ozone NAAQS

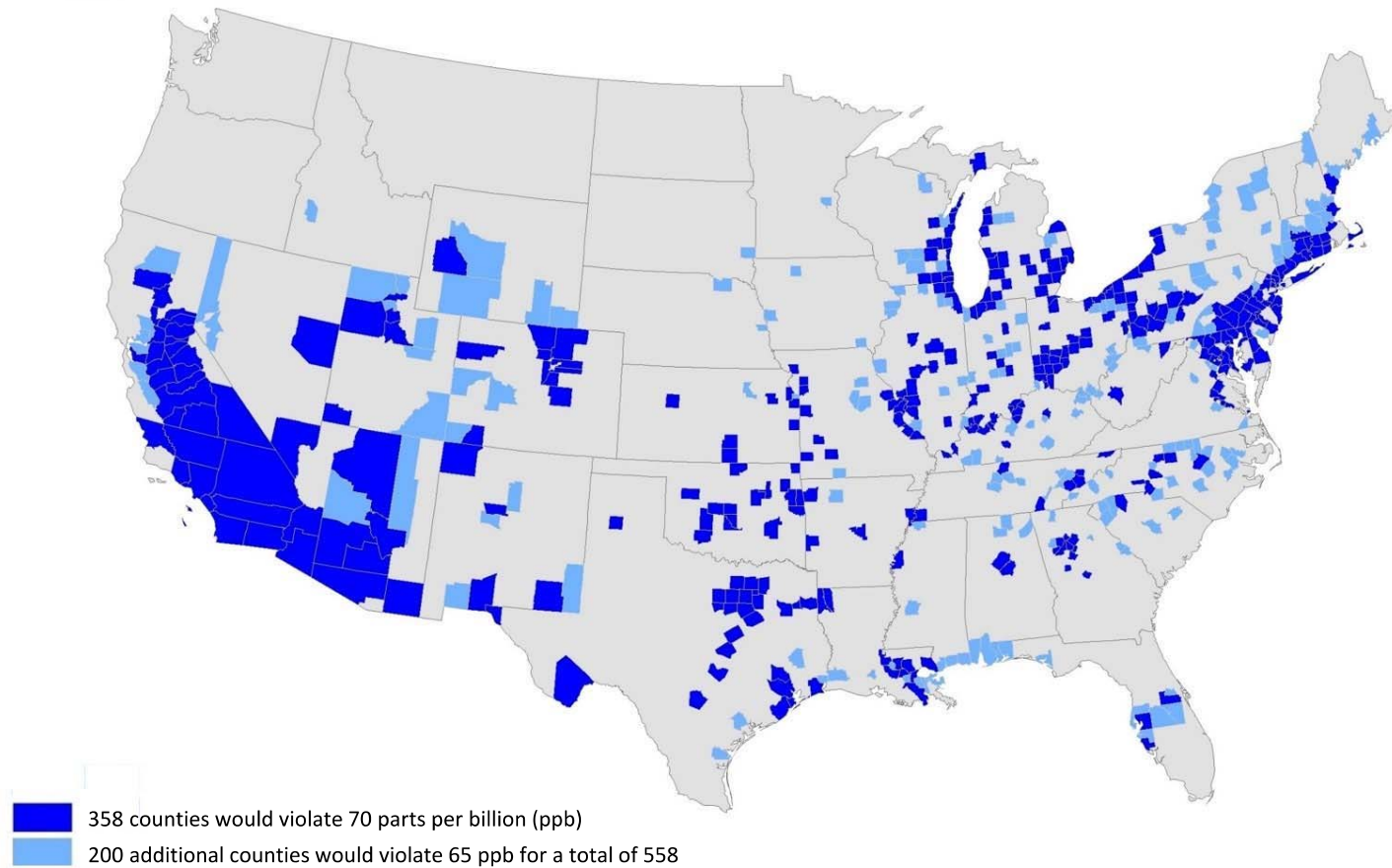
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Hypothetical: Assume new ozone NAAQS set at 68 ppb

- Must determine whether AQCRs meet the new standard (~24 month process)
  - States submit recommendations to EPA
  - EPA reviews and approves AQCR designations
- Once area designations in effect, sources must comply with relevant standards
  - PSD for attainment areas, NNSR for nonattainment areas
- States must also submit updated SIPs reflecting revised NAAQS (~36 months)

# Concept Review: Proposed Ozone NAAQS

Counties Where Measured Ozone is Above Proposed Range of Standards (65 – 70 parts per billion)



Based on 2011 – 2013 monitoring data



# Review of Air Quality Planning

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- Section 108: List criteria pollutants
- Section 109: Set NAAQS for criteria pollutants
- Section 107: Designate AQCRs
- Section 110: Creation and adoption of SIPs
- Sections 160-169: Attainment area requirements
- Sections 171-193: Nonattainment area requirements

# The Big Picture

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Title I	Air Quality Planning; PSD; Nonattainment; New Source Performance Standards; Air Toxics; Enforcement
Title II	Mobile Sources
Title III	General Provisions
Title IV	Noise Pollution
Title IV-A	Acid Rain Program
Title V	Operating Permits
Title VI	Stratospheric Ozone Protection

# The Big Picture

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- Title I            Air Quality Planning; PSD; Nonattainment; New Source Performance Standards; Air Toxics; Enforcement
- New Source Performance Standards
    - Implement nationwide technology-based standards that establish the minimum floor of emission limitations applicable to certain categories of sources
    - Can regulate smaller sources not subject to PSD/NNSR review
    - Important in the context of GHG regulation
  - Air Toxics
    - Establishes technology-based MACT standards
    - Followed by residual risk standards

# The Big Picture

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## Title II            Mobile Sources

- Authorizes EPA to set emissions standards for certain types of mobile sources
  - Cars, trucks, buses, motorcycles, airplanes, ships, and other non-road mobile sources
  - EPA can recall vehicles that do not comply with emissions standards
- Mandates regulation of fuels and fuel additives
  - Includes reformulated gasoline program and renewable fuels mandate
- Greenhouse gas (“GHG”) standards for MY 2012 and beyond vehicles
  - Essentially fuel efficiency standards

# The Big Picture

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## Title III            General Provisions

- Includes definitions and enforcement provisions

## Title IV            Noise Pollution

## Title IV-A        Acid Rain Program

- Creates cap-and-trade system for regulation of SO<sub>2</sub> and NO<sub>2</sub> from power plants

## Title V            Operating Permits

- Intended to bring together all applicable federally required air pollution control requirements into a single permit

## Title VI            Stratospheric Ozone Protection

- Regulates CFCs, HCFCs, and other ozone-depleting substances



## Recent Cases (non-GHG related)

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- *EPA v. EME Homer City Generation, LP* (2014)
  - Upheld EPA’s Cross-State Air Pollution Rule
  - Overturned D.C. Circuit opinion invalidating the rule
  - Found EPA’s allocation of emission reductions among upwind states to be permissible, workable, and equitable interpretation of the “Good Neighbor” provision
  - Deferred to EPA’s expertise

## Recent Cases (non-GHG related)

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- *Michigan v. EPA* (2015)
  - Remanded EPA’s Mercury and Air Toxics (“MATS”) for failure to consider costs
  - Overturned D.C. Circuit upholding the rule
  - Section 112(n)(1)(A) required that, prior to regulating hazardous air pollutants from power plants, EPA had to conduct a study to determine whether it was “necessary and appropriate” to regulate power plants
  - EPA did not consider costs during this study, but did consider costs in the standard-setting phase and in the Regulatory Impact Analysis
  - Majority held that it was unreasonable for EPA to fail to consider costs in the initial decision to regulate

## Recent Cases (non-GHG related)

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- *Michigan v. EPA* (2015)

–“One would not say that it is even rational, never mind ‘appropriate,’ to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits.” (Justice Scalia, majority opinion)

–“The Agency acted well within its authority in declining to consider costs at the opening bell of the regulatory process given that it would do so in every round thereafter—and that the emissions limit finally issued would depend crucially on those accountings.” (Justice Kagan, dissenting opinion)

–Rule remains in effect while D.C. Circuit decides appropriate remedy (remand or vacatur)

- Industry may favor remand due to imminent litigation over the Clean Power Plan



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