CLEAN AIR ACT BASICS

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Part I

Overview and Stationary Sources

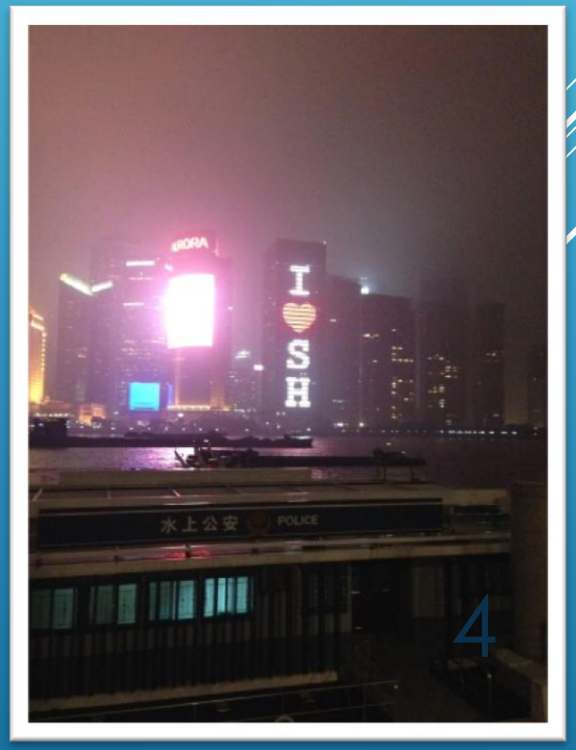
OVERVIEW

- Basic Structure of the Clean Air Act
- History of the Clean Air Act
- Federal Statutory Requirements
  - Criteria Pollutants
  - NAAQS
  - SIPs
  - NSPS
  - NESHAPs

HISTORY OF TODAY'S CLEAN AIR ACT

- The Air Pollution Control Act of 1955
  - Research-focused: provided federal funding to research air pollution
- Mounting concern over air pollution health hazards
  - Lots of air pollution related deaths in the 1950s: London (4,000 died in 1952); NYC (250 died in 1953)
  - Raised awareness of air pollution-related health issues.
- Clean Air Act of 1963
  - Added additional research and grant programs
  - Directed the Department of Health, Education, and Welfare to address interstate air pollution
- Air Quality Act of 1967

Source: New York Times



CLEAN AIR ACT AMENDMENTS OF 1970

- Charged EPA with Establishing NAAQS
  - National Ambient Air Quality Standards (Nail)
- Directed EPA with promulgating guidance to assist states in developing State Implementation Plans (SIPs)
  - SIPs are the mechanism to meet NAAQS (Hammer)

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

- Air Quality Planning
- Prevention of Significant Deterioration
- Nonattainment
- New Source Performance Standards
- Air Toxics
- Enforcement

BASIC STRUCTURE: TITLE I

- 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

BASIC STRUCTURE: TITLE I

BASIC STRUCTURE: 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

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_2 and NO_2 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

OTHER PROGRAMS/PROVISIONS

STATIONARY SOURCE

- National Ambient Air Quality Standards (NAAQS)
  - 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

CRITERIA POLLUTANTS

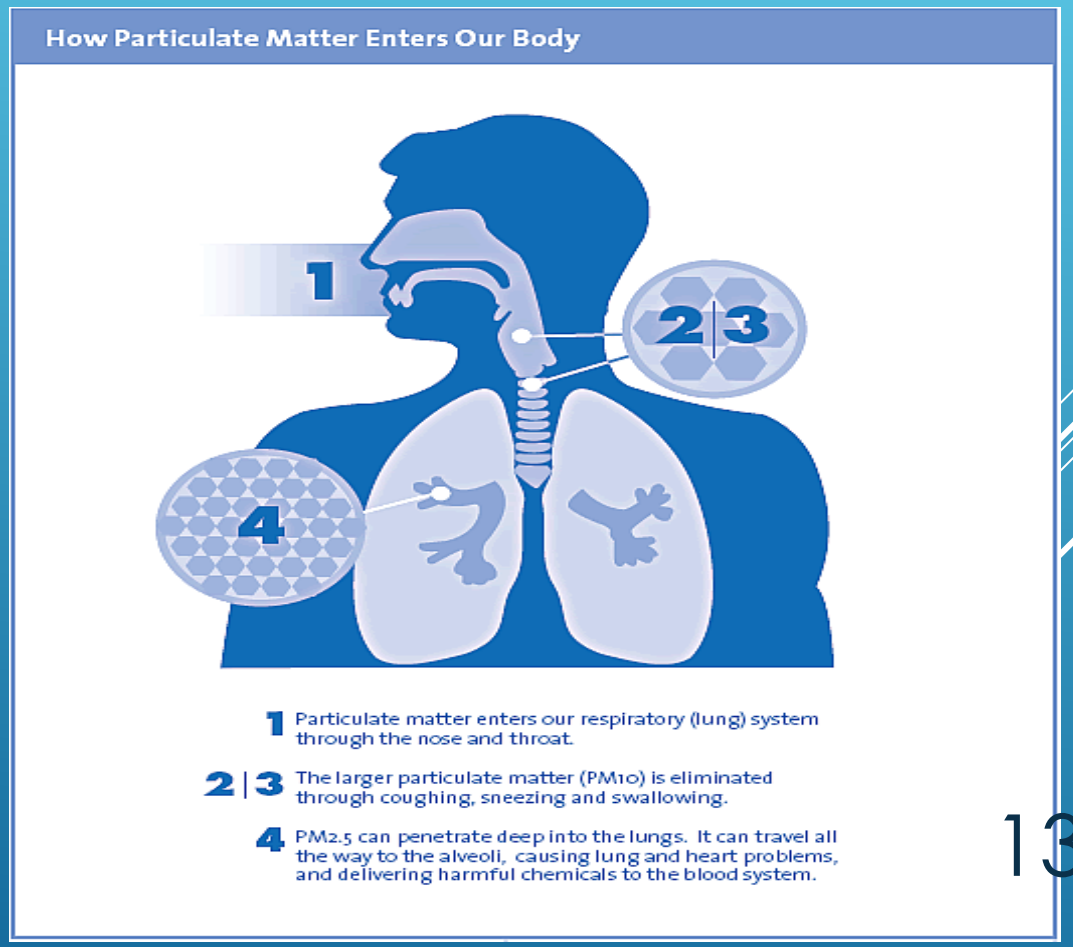
Particulate matter ($PM/PM_{10}/PM_{2.5}$)

Sources

CRITERIA POLLUTANTS

Particulate matter ($PM/PM_{10}/PM_{2.5}$)

Health Effects



Source: British Columbia Air Quality

CRITERIA POLLUTANTS

Particulate matter ($PM/PM_{10}/PM_{2.5}$)

Source: Climate and Geohazards

Environmental Effects

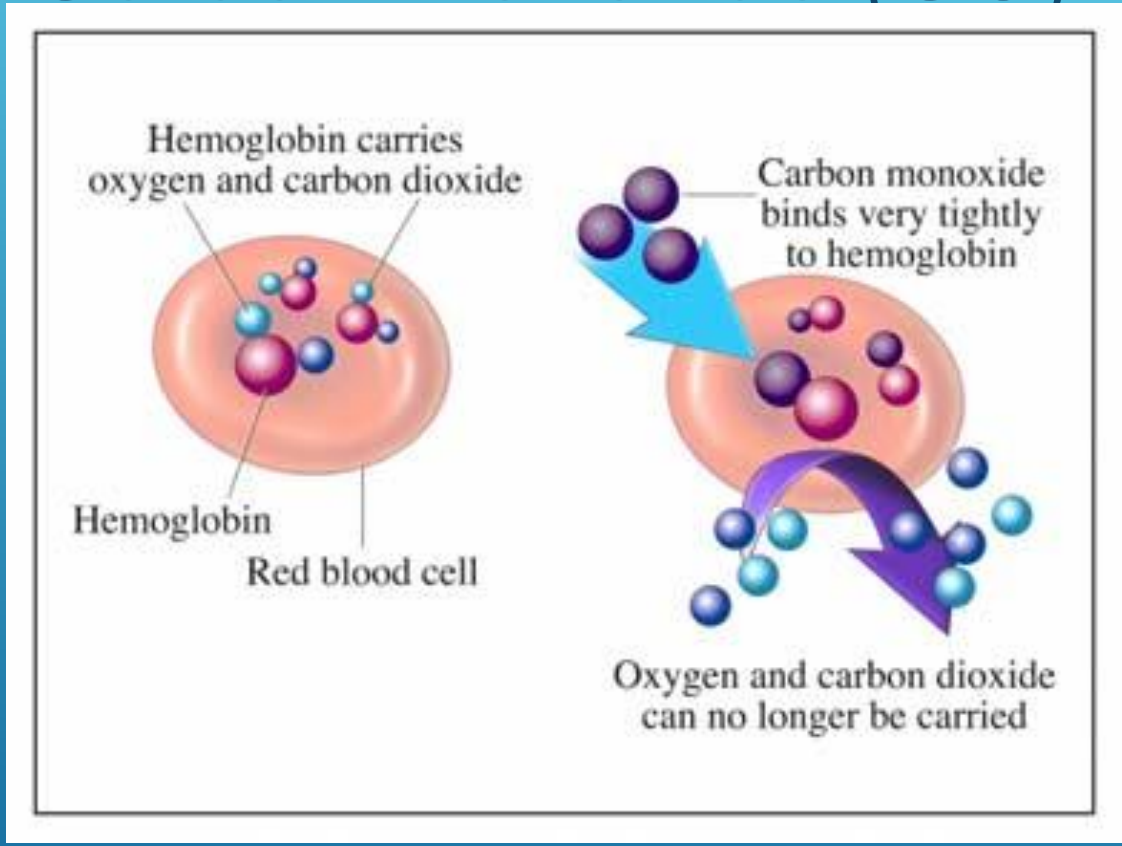
CRITERIA POLLUTANTS

Carbon monoxide (CO)

Sources

CRITERIA POLLUTANTS

Carbon monoxide (CO)



Source: UVa Health

Health Effects

CRITERIA POLLUTANTS

Nitrogen dioxide (NO_2) and Ozone (O_3)

Sources

CRITERIA POLLUTANTS

Nitrogen dioxide (NO_2) and Ozone (O_3)

Health Effects

CRITERIA POLLUTANTS

Nitrogen dioxide (NO_2) and Ozone (O_3)

CRITERIA POLLUTANTS

Sulfur dioxide (SO_2)

CRITERIA POLLUTANTS

Sulfur dioxide (SO_2)

Health Effects

CRITERIA POLLUTANTS

Sulfur dioxide (SO_2)

CRITERIA POLLUTANTS

Sulfur dioxide (SO_2)

Environmental Effects

CRITERIA POLLUTANTS

Lead

Sources

CRITERIA POLLUTANTS

Lead

Health Effects

Clean Air Act Overview

ELI Summer Institute

Washington, DC
July 10, 2018

Janet McCabe
Indiana University McKinney School of Law
Environmental Law and Policy Center

Major concepts in the Clean Air Act

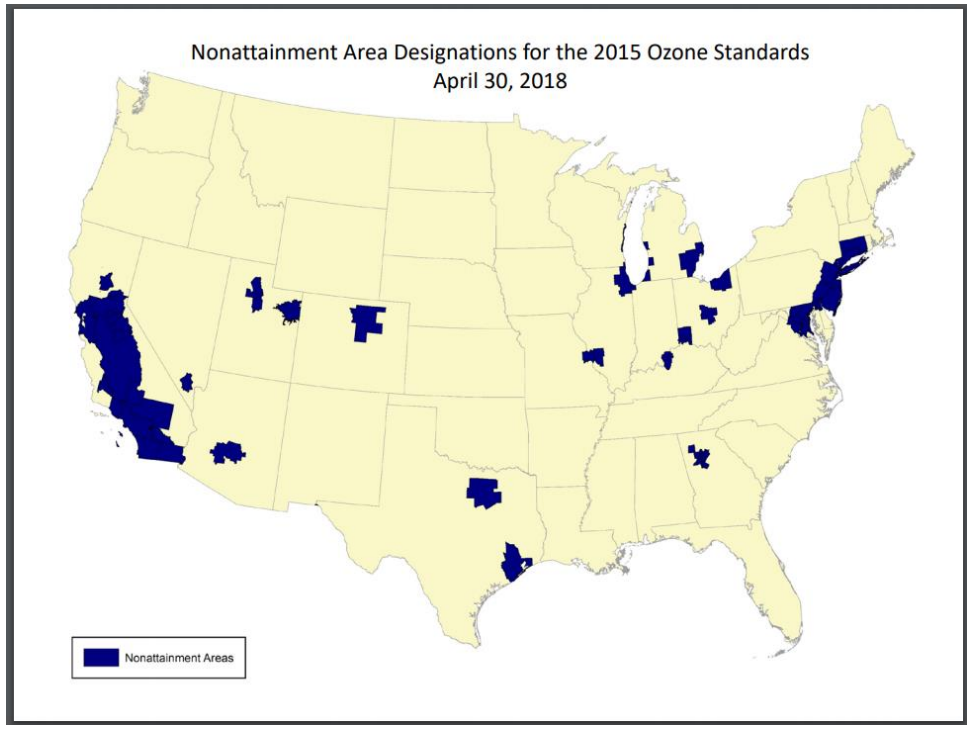
- Federal-state partnership
- New sources vs. existing sources
- Regular review and updating of regulations
- Iterative progress towards cleaner air
- Lots of regulatory activity
- Policies, preambles, interpretative documents, caselaw, administrative determinations

Implementing the NAAQS [major jargon alert]

- Step 1: Designation of areas that do and don't meet the standards
- Step 2: States prepare State Implementation Plans (SIPs)
- Step 3: EPA reviews state plans
- Step 4: States implement plans
- Step 5: Assess progress towards attainment
- Step 6: Redesignation (maintenance) or more planning

Nonattainment areas

- Poor air quality
- Contribute to poor air quality
- Geographic extent
- Mandatory SIP elements
- Permitting implications
- Transportation planning



Elements of a State Implementation Plan

- Air quality monitoring
- Air quality modeling
- Emission inventories and forecasts
- Emission control strategies
  - State/federal/regional
- Permitting
- Compliance and enforcement authority
- Policies and rules that the state uses to attain and maintain the NAAQS.

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

Control measures

- New vs. existing sources
- “reasonably available” / “best available”
- Federal and state measures

Planning for Ozone and PM

- Additional rules under the CAA
- Ozone very detailed process (Sections 171-192)
  - States had not made sufficient progress prior to 1990
- Increasing severity; increasing time to attain
- Numerous mandatory requirements
  - measures build on one another
- Special case for California

New Source Performance Standards
Section 111(b)

- Technology-based
- Apply everywhere
- For source categories that:
  - cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare
- Best System of Emission Reduction
- Focus on new sources—build clean!
- Review and revise, as appropriate, every 8 years
- SIP-like process for existing sources (Section 111(d))

Who is subject to NSPS

- What is a “source”?
  - Can be an individual emitting unit
- What is a “new” source?
  - Triggered by proposal
- What is a “modification”?
  - A physical change that results in an increase in the emission rate of any pollutant to which a standard applies
  - WEPCO case, 893 F. 2d 901 (7th Circuit 1990) Modifications and routine maintenance, repair and replacement

Toxic Air Pollutants

National Emissions Standards for Hazardous Air Pollutants

- How we got to modern Section 112
  - Administrator to identify pollutants reasonably anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness.
  - Set emission standards at a level that provides an ample margin of safety to protect the public health.
  - Very few standards were set (benzene, beryllium, asbestos, vinyl chloride, radionuclides, arsenic, mercury)– Too hard!!
- Frustration at slow progress; difficulty of meeting Act's requirements

1990 Amendments—completely different approach

- Technology based approach
- Pollutants listed in Act
- EPA to identify source categories
- Establish maximum available control technology (MACT) standards
- Review and revise every 8 years
- Residual risk analysis
- Comprehensive approach

What is MACT?

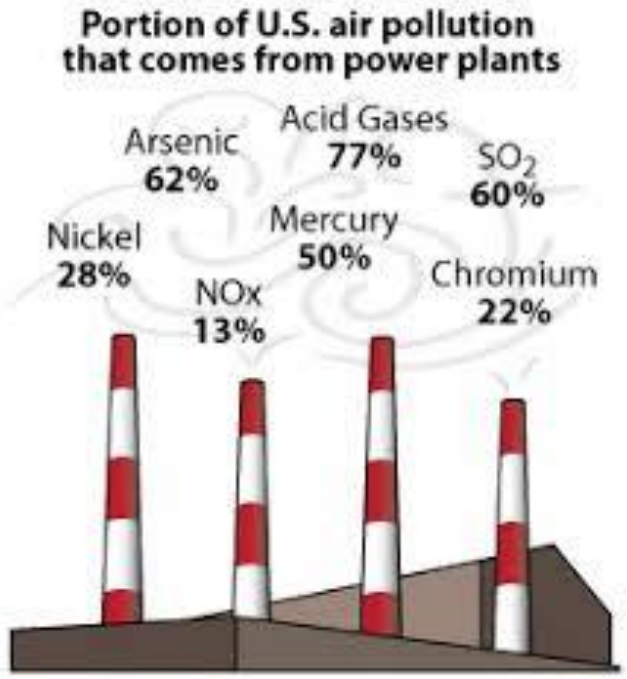
"The maximum degree of reduction in emissions of the hazardous air pollutants subject to this section (including a prohibition on such emissions, where achievable) that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources in the category or subcategory to which such emission standard applies, through application of measures, processes, methods, systems or techniques…"

Are we safer?

- National Air Toxics Assessment (NATA) issued in 2015 based on 2011 data
  - Monitoring data and emissions inventories show overall reductions in air toxics across the country as a result of Clean Air Act programs.
  - Nationwide, the key pollutants that contribute most to overall cancer risks are formaldehyde, benzene, and acetaldehyde.
  - The key pollutants that contribute most to overall nationwide non-cancer risk are acrolein, diesel PM, and chlorine.
  - On-road mobile sources contribute most to risk nationwide.

Mercury and Air Toxics Rule

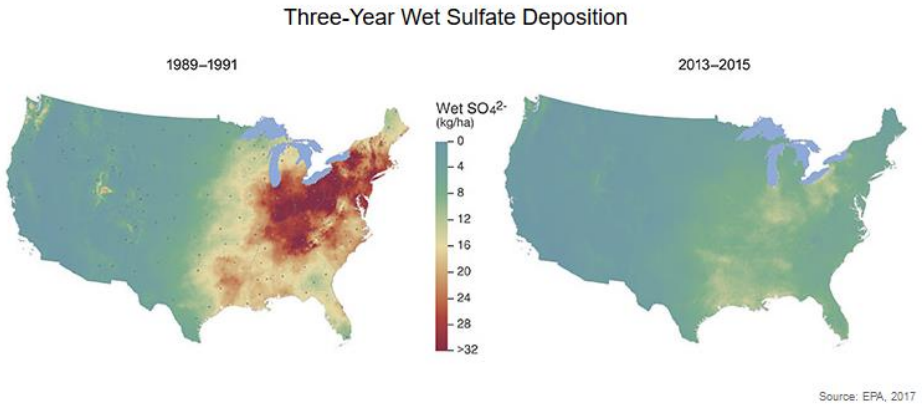
- Appropriate and Necessary Finding
- Clean Air Mercury Rule: from 112 to 111
- And back again: MATS
- Cost consideration
- Co-benefits
- New vs. existing
- Timing of compliance
- Reliability safety valve

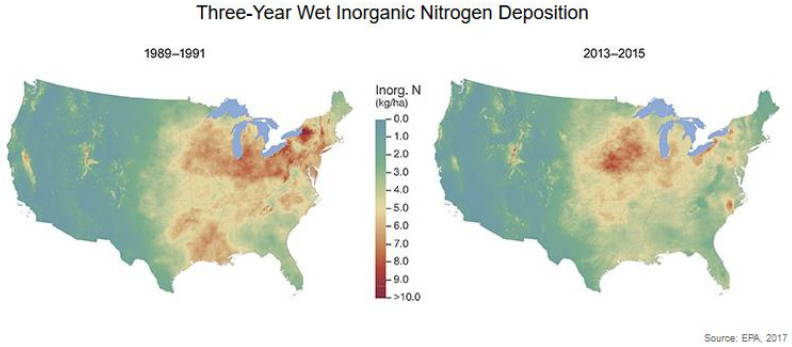


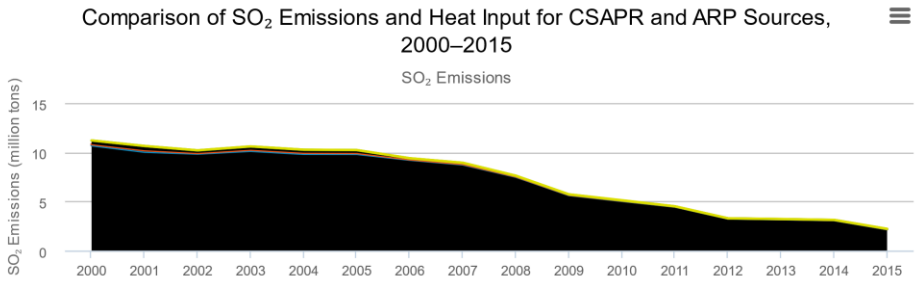
Transboundary air pollution challenges

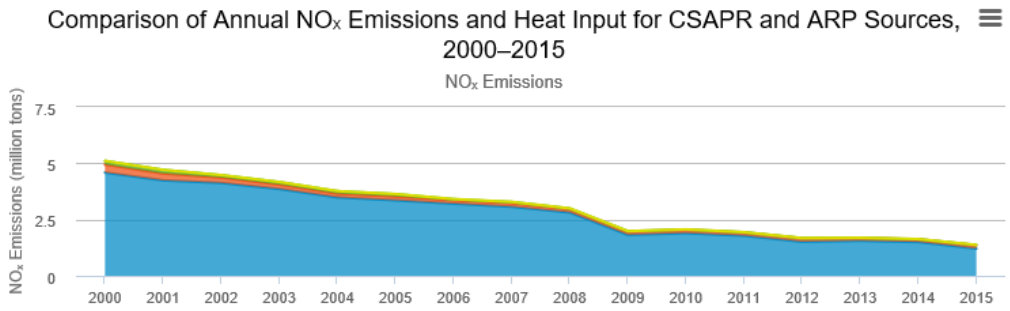
- Acid Rain
- Ozone
- PM
- Haze/visibility
- Mercury
- Greenhouse gasses

Regional transboundary – Acid Rain



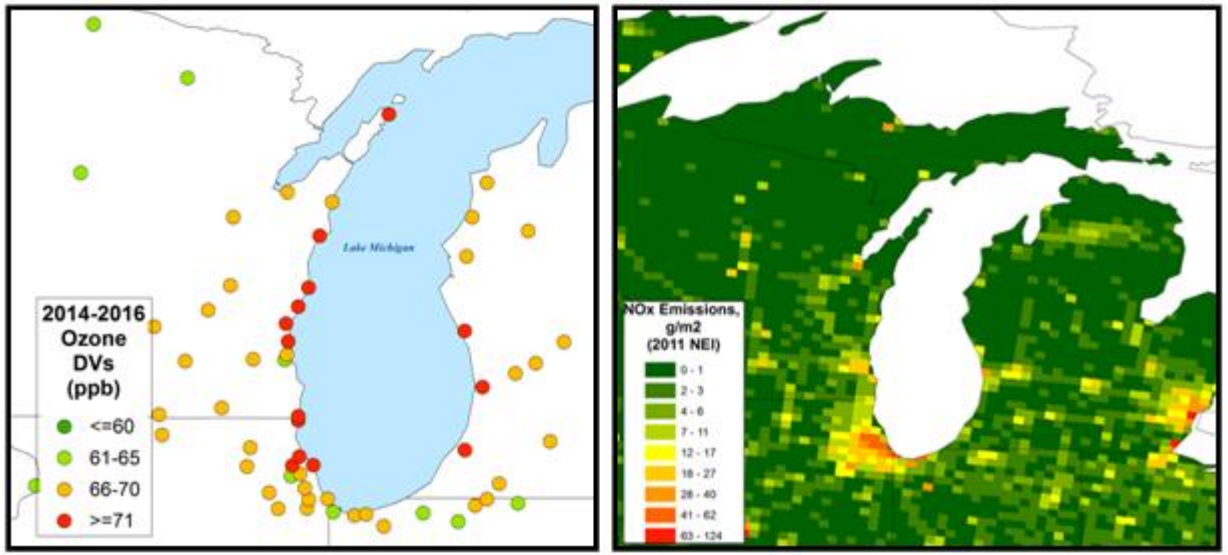


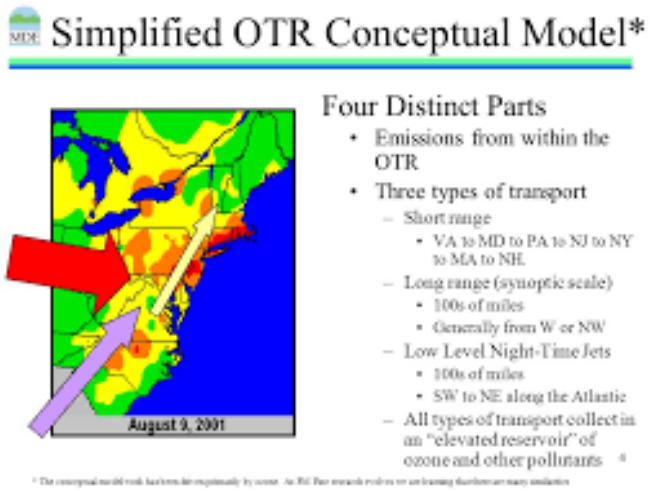




Metropolitan area transboundary pollution

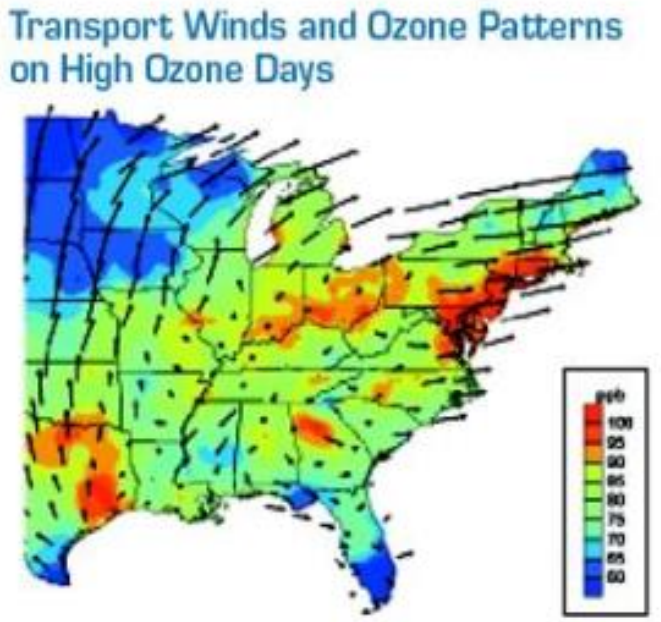
- Chicago
- New York
- Ozone Transport Region





Regional Transboundary Pollution
The Good Neighbor Provision

- Sections 110(a)(2)(d) and 126
- NOx SIP Call
- CAIR
- CSAPR
- Transport Update Rule



Regional Haze

- Very ambitious goal
- Long trajectory
- Affects west more than east
- Technology phase, then reasonable progress towards goal
- State by state submissions (consistency?)

Major concepts in permitting

- Construction permits vs operating permits
- Major vs minor vs *synthetic minor* sources
  - “Potential to emit”
- Attainment vs nonattainment area permits
- Technology and air quality reviews
- New sources and modifications
- Source specific vs *general* permits
- Opportunity for public input
- State-EPA relationship in permitting
- Insignificant activities

Construction permits

- Timing of permit review
- What are the things to think about in deciding what kind of air permit is needed?
  - What pollutants will be emitted?
  - Potential to emit of source?
  - Is activity a modification?
  - Is it in an attainment or nonattainment area?
  - Who is the permitting agency?
  - What kinds of emission reduction options are there?
  - What impacts will emissions have on local air quality?

Contents of Construction Permits

- Description of source
- General conditions
- Emission limits
- Compliance monitoring requirements
- Reporting requirements
- Federal requirements, state requirements

https://www.epa.gov/nsr/new-source-review-policy-and-guidance-document-index

Permitting of Major Sources (New and Expanding)

- In attainment areas
  - Prevention of Significant Deterioration
  - Major source 250 or 100 tons per year
  - Best Available Control Technology
  - Air quality analysis
  - PSD “increment”
- In nonattainment areas
  - Major source threshold is smaller
  - Lowest Achievable Emission Rate
  - Emission Offsets
  - Air quality analysis to protect NAAQS

Table 1 Major Source/Major Modification Emission Thresholds

Nonattainment Classification	Major Source Threshold (tpy)	Major Modification Threshold (tpy)
Marginal	100	40
Moderate	100	40
Serious	50	25
Severe	25	25
Extreme	10	10

Permitting of “Synthetic Minor” Permits

- Potential to emit calculation is critical
  - Emission factors vs. source specific information
- Limitations on PTE
  - Federally enforceable
  - Practically enforceable
- Additional burdens on source to assure they meet their limits

Modifications

- Physical change or change in method of operation

AND

- Significant emissions increase
  - Potential to emit
  - Net emissions increase

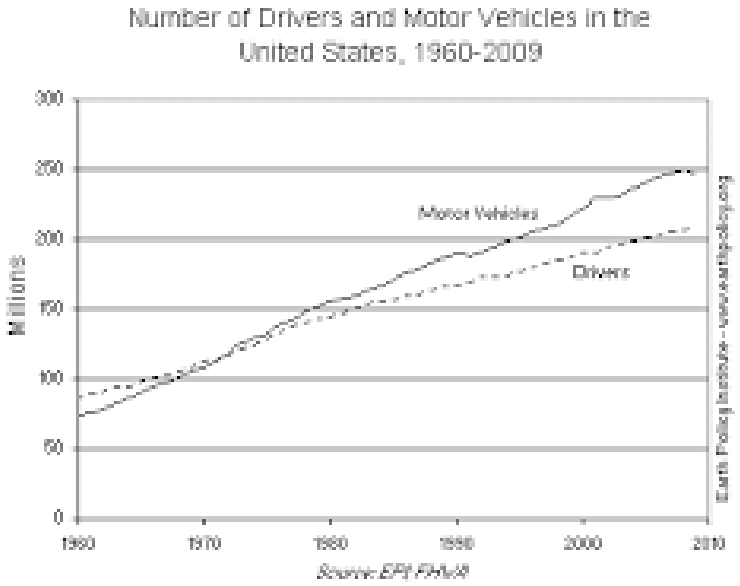
- Routine repair or maintenance

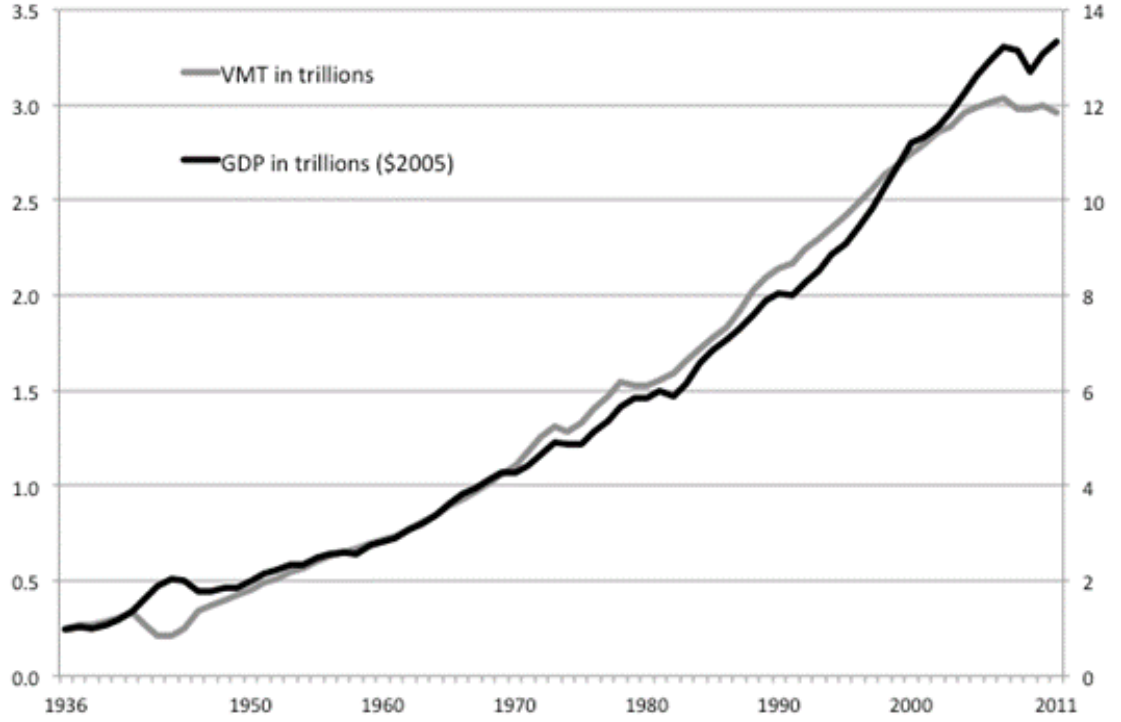
Operating Permits (Title V)

- Added in 1990 Clean Air Act
- Consistent expectations for permits across the country for sources larger than 100 TPY (10/25 for air toxics)
- All requirements in a single document
- Permit fees to support consistent acceptable permit programs
- Compliance monitoring requirements
- Compliance schedules
- Permit shield
- Renewed regularly

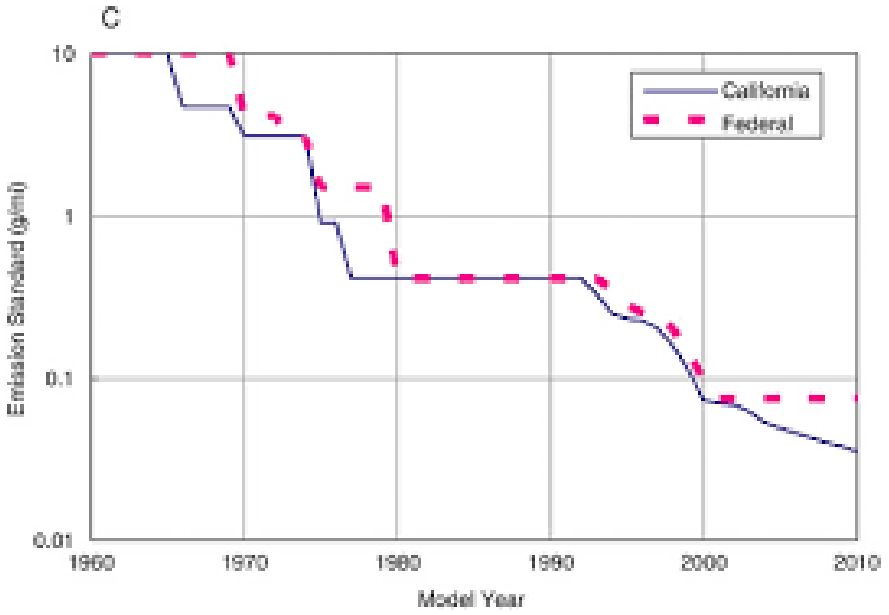
The car in America

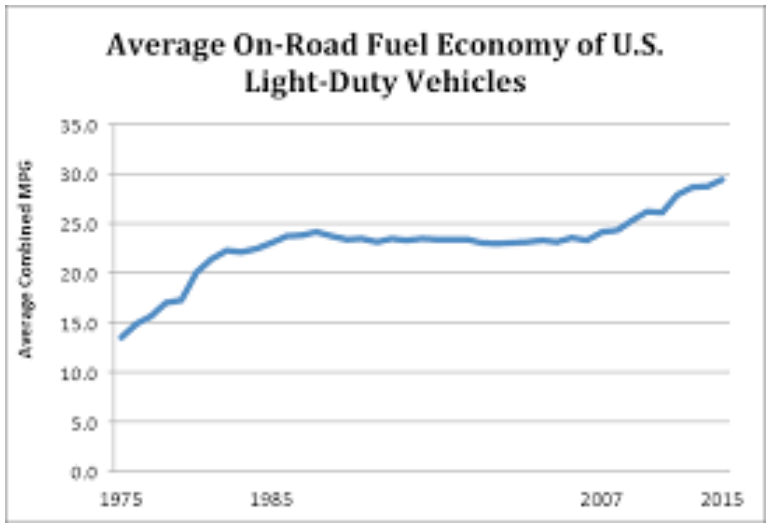
More cars, more drivers, more miles





But the Clean Air Act and innovation has made them far cleaner





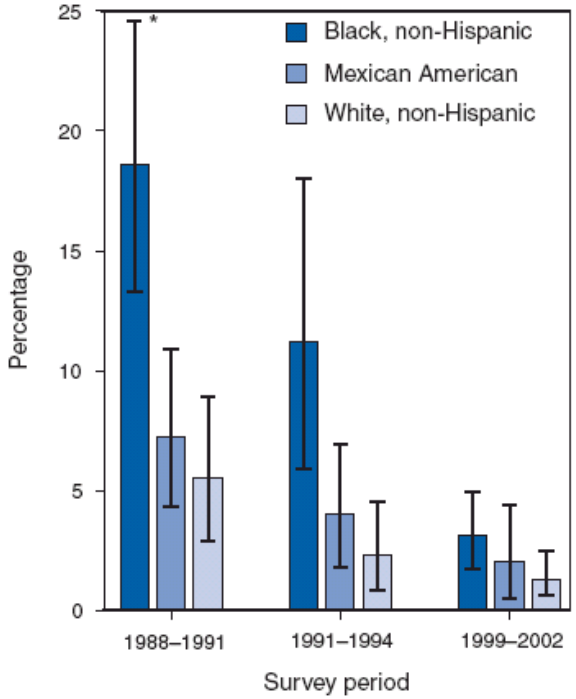
Key themes for Title II

- New vehicles vs. vehicles in use
- Tailpipe standards and fuel standards, technology forcing standards
- On-road, non-road vehicles, and non-road engines
- Compliance activities
- California authorities
- Light duty and heavy duty
- Challenges of regulating a consumer good
- Tailpipe standards and fuel economy standards
- Harmonization—domestically and internationally
- Alternative fuels
- Tampering

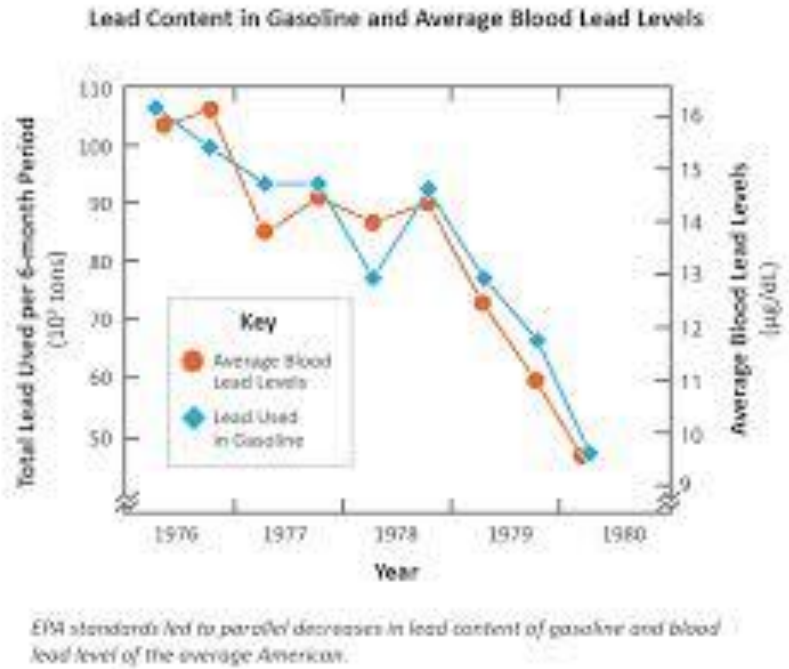
Lead in Gasoline

One of the greatest public health success stories

FIGURE. Percentage of children aged 1–5 years with blood lead levels ≥10 µg/dL, by race/ethnicity and survey period — National Health and Nutrition Examination Surveys, United States, 1988–1991, 1991–1994, and 1999–2002



*95% confidence interval.



EPA standards led to parallel decreases in lead content of gasoline and blood lead level of the average American.

Ocean-going vessels

Expected ECA Benefits

Impact of regulations projected to extend from U.S. ECA waters and coastline into nation's interior.

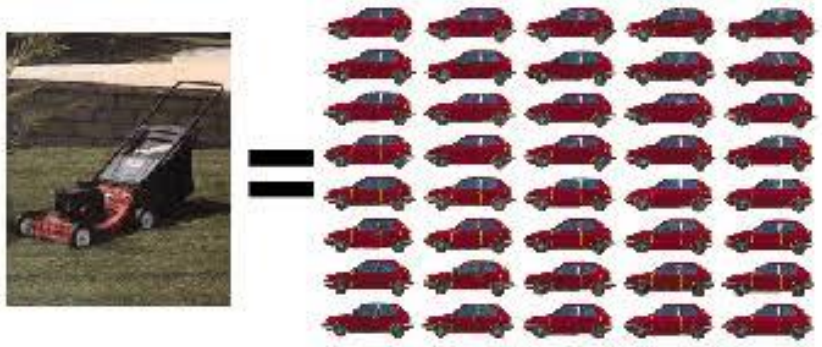
North American ECA applies to 200 nautical miles [370.4 km] of U.S. coasts

Aircraft

- GHGs: 12% of transportation emissions; 3% of total US emissions
- Endangerment finding issued in 2016 International dynamics (International Civil Aviation Organization)
- Relationship with FAA
  - EPA can only set emission standards (not fuel)
  - Must consult with FAA
  - Cannot compromise noise or safety
- Lead in aviation gas

Nonroad Engines

- Sheer number of engines
- Import issues



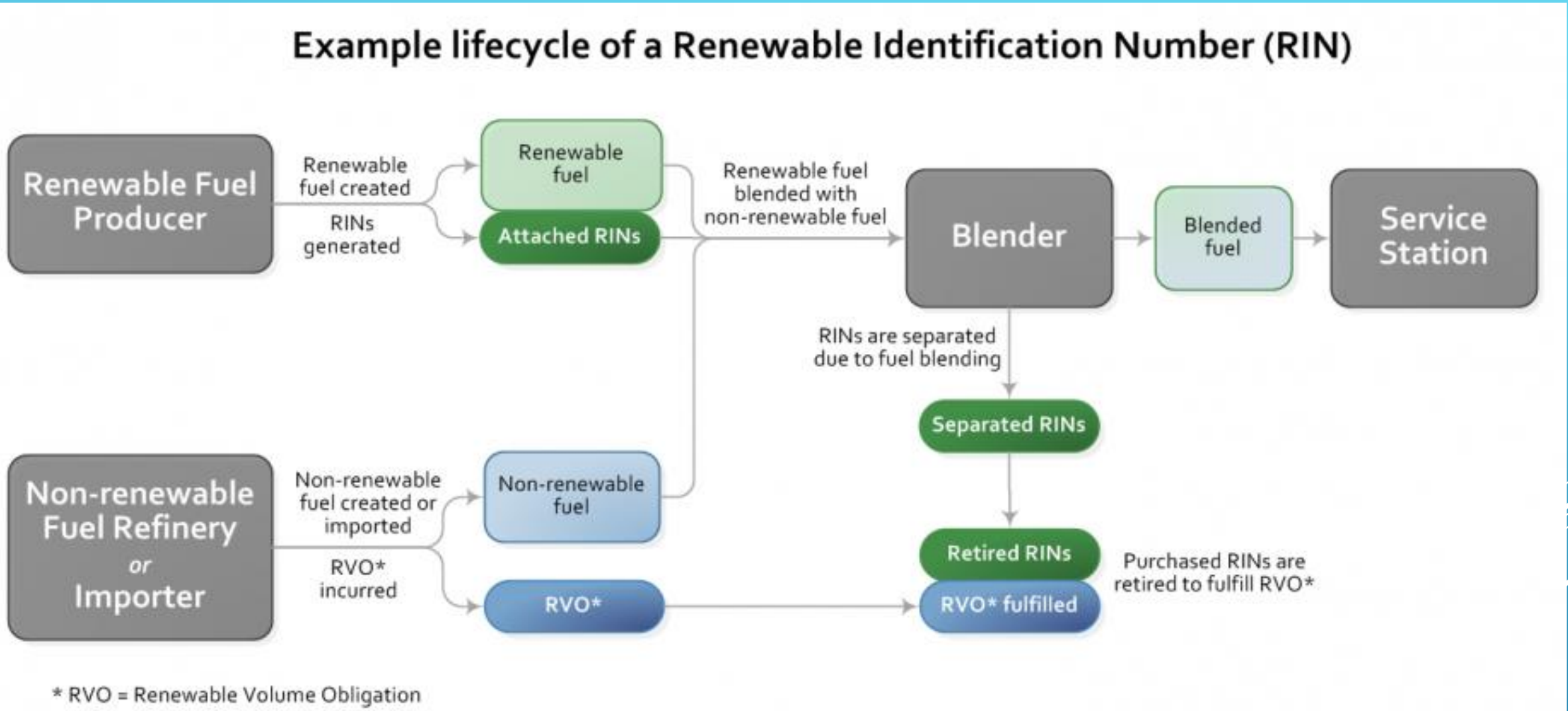
- Established through the Energy Policy Act of 2005
- Amended through the Energy Independence and Security Act of 2007
- Goal: To increase the use of renewable fuels in the U.S. transportation system every year and reduce dependence on foreign fuels
- Sets annual volumes of renewable fuel as a percentage of fuel sold
- Four nested categories of "renewable fuel"
  - Renewable fuel
  - Advanced biofuel
  - Biomass-Based Diesel
  - Cellulosic biofuel

THE RENEWABLE FUEL STANDARD

HOW THE RFS WORKS

- EPA, with the assistance of the Energy Information Administration, estimates fuel consumption for coming year
- EPA then determines what percentage of renewable fuel the fuel market can accommodate
- Refiners/Importers of traditional fuels (gasoline and diesel) must meet renewable volume obligations (RVO)
- RINs are used to track compliance

Source: New York Times



RFS TABLE (EPA)

THE RENEWABLE FUEL STANDARD

- Issues that have arisen with the RFS:
  - Lots of fraud and volatility in RINs
  - Blendwall issue with ethanol
  - Limits on biodiesel blending in winter
  - Reliance on foreign imports of renewable fuels
  - Biodiesel "dumping" driving down domestic price
  - Disputes over appropriate "point of obligation"
  - Advanced biofuels have failed to develop as hoped