

The logo for Hogan Lovells, consisting of the name "Hogan Lovells" in a black serif font, positioned inside a solid yellow square.

Hogan
Lovells

Basics of the Clean Air Act

Environmental Law Institute
Summer School

Emily Kimball & Mark Foster

July 7, 2016



Part I

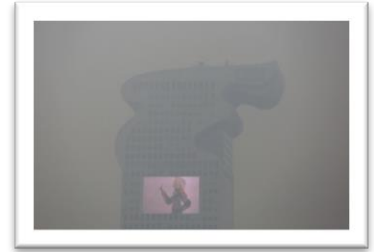
Overview and Stationary
Sources

Overview

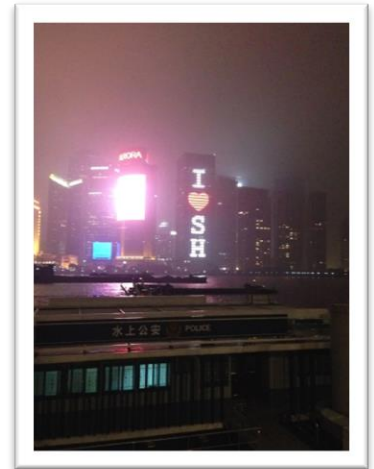
- Basic Structure of the Clean Air Act
- History of the Clean Air Act
- Federal Statutory Requirements
 - Criteria Pollutants
 - NAAQS
 - SIPs
 - NSPS
 - NESHAPs

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)

Basic Structure

- 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

Basic Structure: 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

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

Other Programs/Provisions

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 SO₂ and NO₂ 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

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/PM₁₀/PM_{2.5})

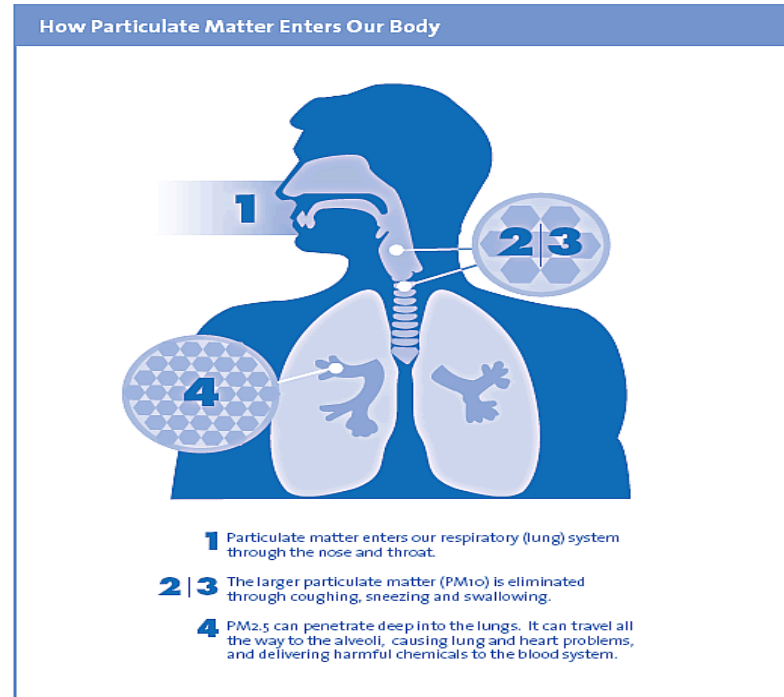


Sources

Criteria Pollutants

Particulate matter (PM/PM₁₀/PM_{2.5})

Health Effects



Source: British Columbia Air Quality

Criteria Pollutants

Particulate matter (PM/PM₁₀/PM_{2.5})



Source: Climate and Geohazards

Environmental Effects

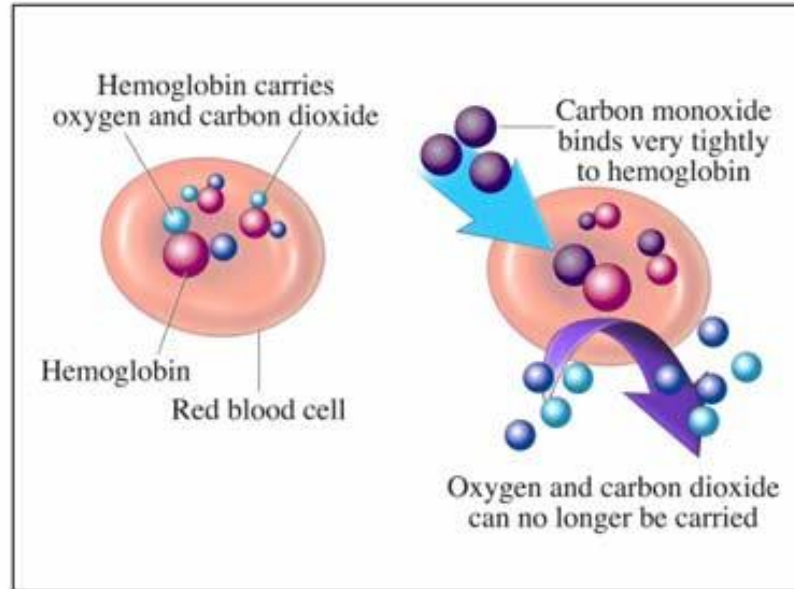
Criteria Pollutants

Carbon monoxide (CO)



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 (NO₂) and Ozone (O₃)



Health Effects

Nitrogen dioxide (NO_2) and Ozone (O_3)



Criteria Pollutants

Sulfur dioxide (SO₂)



Criteria Pollutants

Sulfur dioxide (SO₂)



Health Effects

Criteria Pollutants

Sulfur dioxide (SO_2)



Criteria Pollutants

Sulfur dioxide (SO_2)



Criteria Pollutants

Lead



Sources

Criteria Pollutants

Lead



Health Effects

National Ambient Air Quality Standards (NAAQS)

- 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 [links to historical tables of NAAQS reviews]	Primary/ Secondary	Averaging Time	Level	Form	
<u>Carbon Monoxide (CO)</u>	primary	8 hours	9 ppm	Not to be exceeded more than once per year	
		1 hour	35 ppm		
<u>Lead (Pb)</u>	primary and secondary	Rolling 3 month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded	
<u>Nitrogen Dioxide (NO₂)</u>	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years	
	primary and secondary	1 year	53 ppb ⁽²⁾	Annual Mean	
<u>Ozone (O₃)</u>	primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	
<u>Particle Pollution (PM)</u>	PM _{2.5}	primary	1 year	12.0 µg/m ³	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m ³	annual mean, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
		primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
<u>Sulfur Dioxide (SO₂)</u>	primary	1 hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	
	secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year	

Achieving NAAQS through Air Quality Planning

- 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

- 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

- 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

- 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)

- 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)

- Step 1 – Identify all control technologies
 - Don't have to consider options that “redefine” the source
 - BACT/RACT/LAER Clearinghouse
- 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

- 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

Review of Air Quality Planning

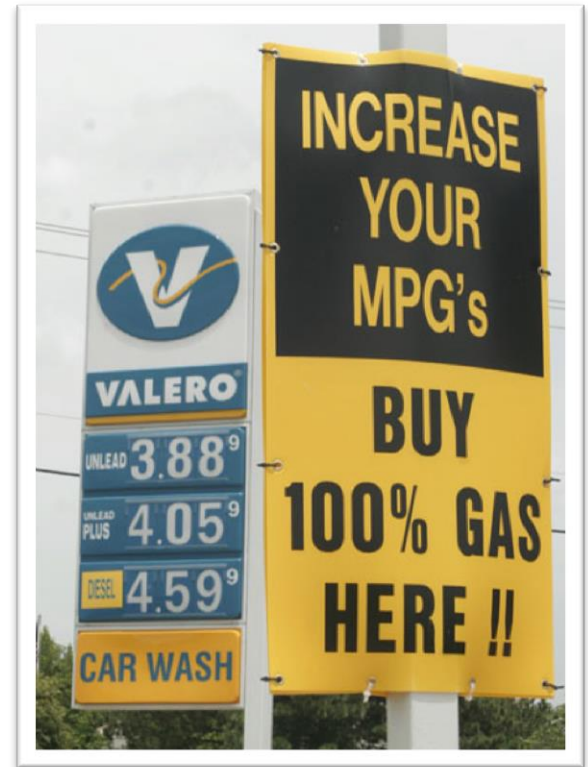
- Section 108: List criteria pollutants
- Section 109: Set NAAQS for criteria pollutants
- Section 107: Designate AQCRs
- Section 110: Creation and adoption of SIPs
- Sections 160-169: Attainment area requirements
- Sections 171-193: Nonattainment area requirements

The Renewable Fuel Standard

- 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
- Sets annual volumes of renewable fuel as a percentage of fuel sold
- Four categories of “renewable fuel”
 - Renewable fuel
 - Advanced biofuel
 - Biomass-based Diesel
 - Cellulosic biofuel

How the RFS Works

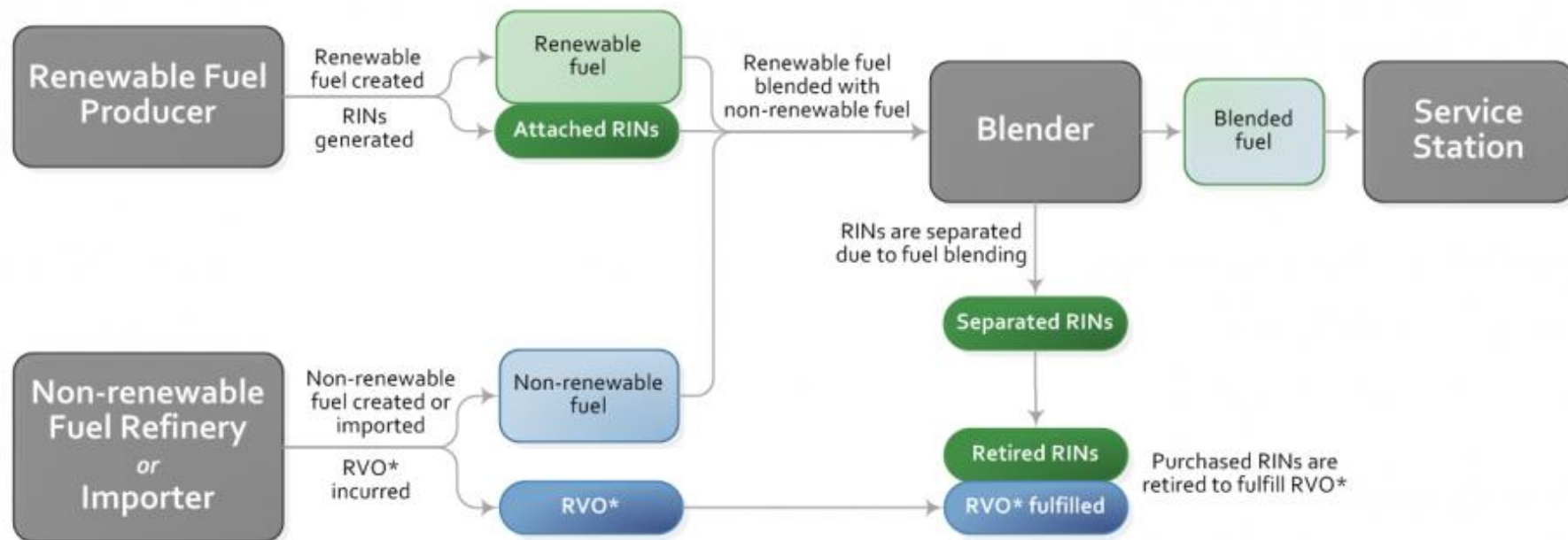
- EPA, with the assistance of the Energy Information Administration, estimates fuel consumption for coming year
- EPA then determines what percentage of renewable fuel the fuel market can accommodate
 - Blend wall
- Refiners/Importers of traditional fuel must meet renewable volume obligations (RVO)
- RINs



Source: New York Times

RFS Table (EPA)

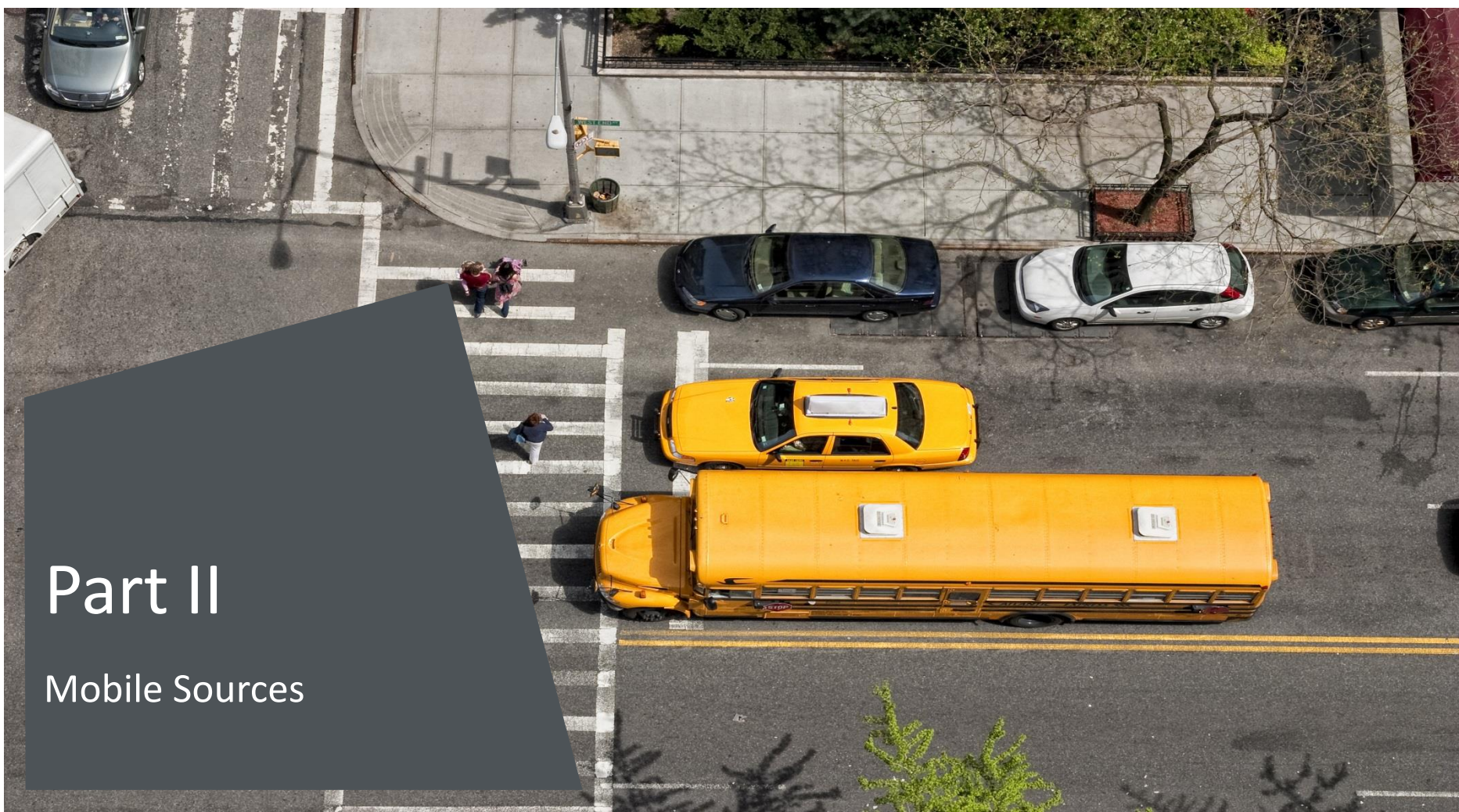
Example lifecycle of a Renewable Identification Number (RIN)



* RVO = Renewable Volume Obligation

Part II

Mobile Sources



Title II – Mobile Sources

- Part A – Motor Vehicle Emission and Fuel Standards
- Part B – Aircraft Emission Standards
- Part C – Clean Fuels Vehicles



What are Mobile Sources?

Types of Vehicles, Engines, and Equipment

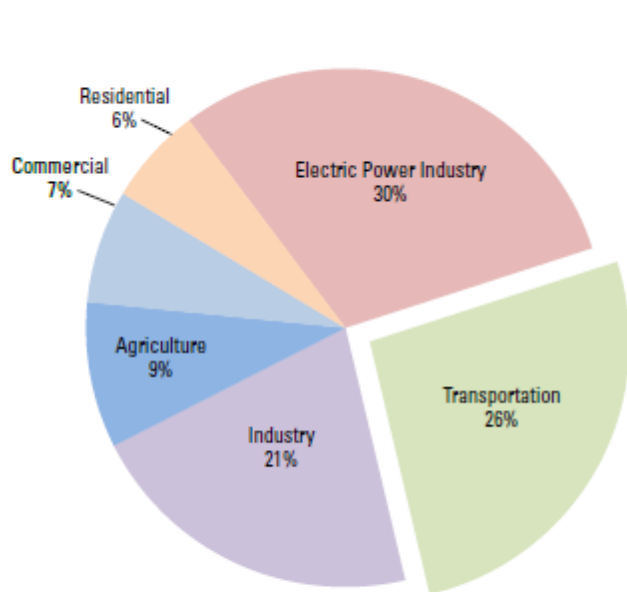
Highway

- Cars & light trucks
- Heavy trucks
- Buses
- Motorcycles

Non-road

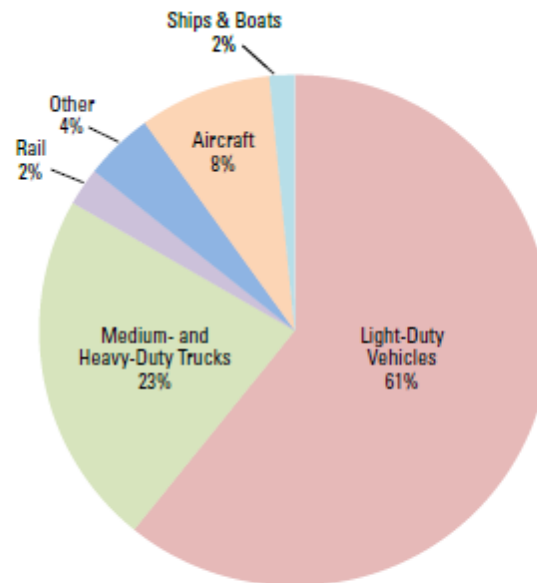
- Aircraft
- Boats and Ships
- Construction Equipment
- Lawn & Garden
- Locomotives
- Personal watercraft
- Snowmobiles, dirt bikes, ATVs

Mobile Source Emissions



Share of U.S. GHG Emissions by Sector^{3,4}

Note: Totals may not add to 100% due to rounding.



Share of U.S. Transportation Sector GHG Emissions by Source^{4,5}

Note: Totals may not add to 100% due to rounding.

Certifying an Engine or Vehicle

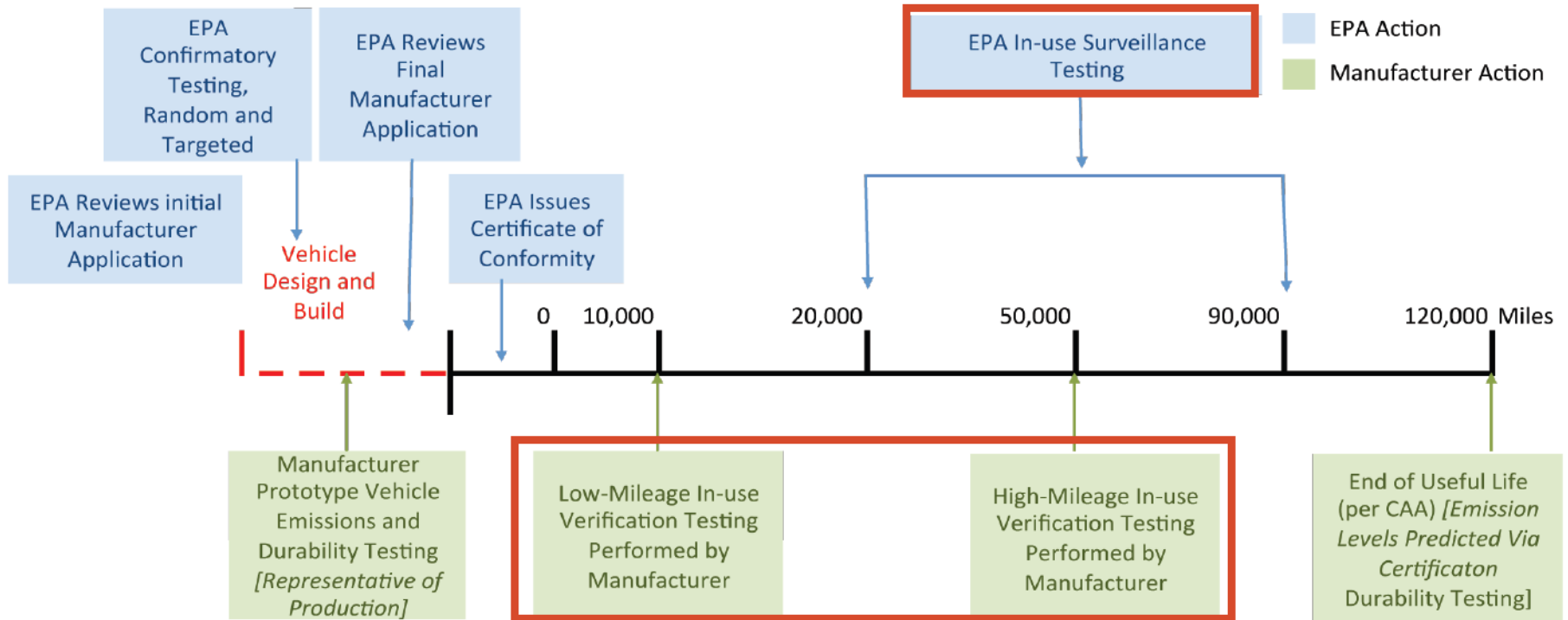
- The US emission standards establish certification emission limits applicable to each certified vehicle, as well as fleet average standards.
- Emission limits differ by engine/vehicle type
- Engines/vehicles sold in the U.S. must be covered by a certificate of conformity (“COC”) issued by EPA
 - Valid for only one model year
- Engines/vehicles must maintain compliance for the duration of their useful life
 - 10 years; 120,000 miles – light duty
 - 10 years; 435,000 miles – heavy duty

Compliance Overview

- Certification
 - Application – must demonstrate that the engine/vehicle meets emission standards for criteria pollutants and GHGs
 - Testing – durability, evaporative
 - Statement of Compliance
- On-Board Diagnostic Systems
- Production Conformity
- In-use Compliance
 - PEMS testing
 - Manufacturer In-use Verification testing (light duty)
 - EPA confirmatory testing
- Emissions Defects/Recalls

Light-Duty Vehicles

Compliance Life



Source: EPA 2007 Progress Report: Vehicle and Engine Compliance Activities



The VW Scandal

Case Study

CAA Legal Framework

Certificates of Conformity

- Vehicles sold in the U.S. must be covered by a certificate of conformity (“COC”) issued by EPA
 - Certifies that the engine complies with emission standards
 - Vehicles covered by COC if conform in all material respects
- Clean Air Act Section 203(a)(1) prohibits selling vehicles or engines in the U.S. not covered by a COC

CAA Legal Framework

Tampering

- Clean Air Act Section 203(a)(3)(A) prohibits all persons (including OEMs and suppliers) from “removing or rendering inoperative any device or element of design” that was installed on the vehicle to comply with emissions standards

CAA Legal Framework

Defeat Devices

- Clean Air Act Section 203(a)(3)(B) prohibits all persons from selling or installing any part or component designed to “bypass, defeat, or render inoperative any device or element of design” that was installed on the vehicle to comply with emissions standards

Basic Facts

What did VW do?

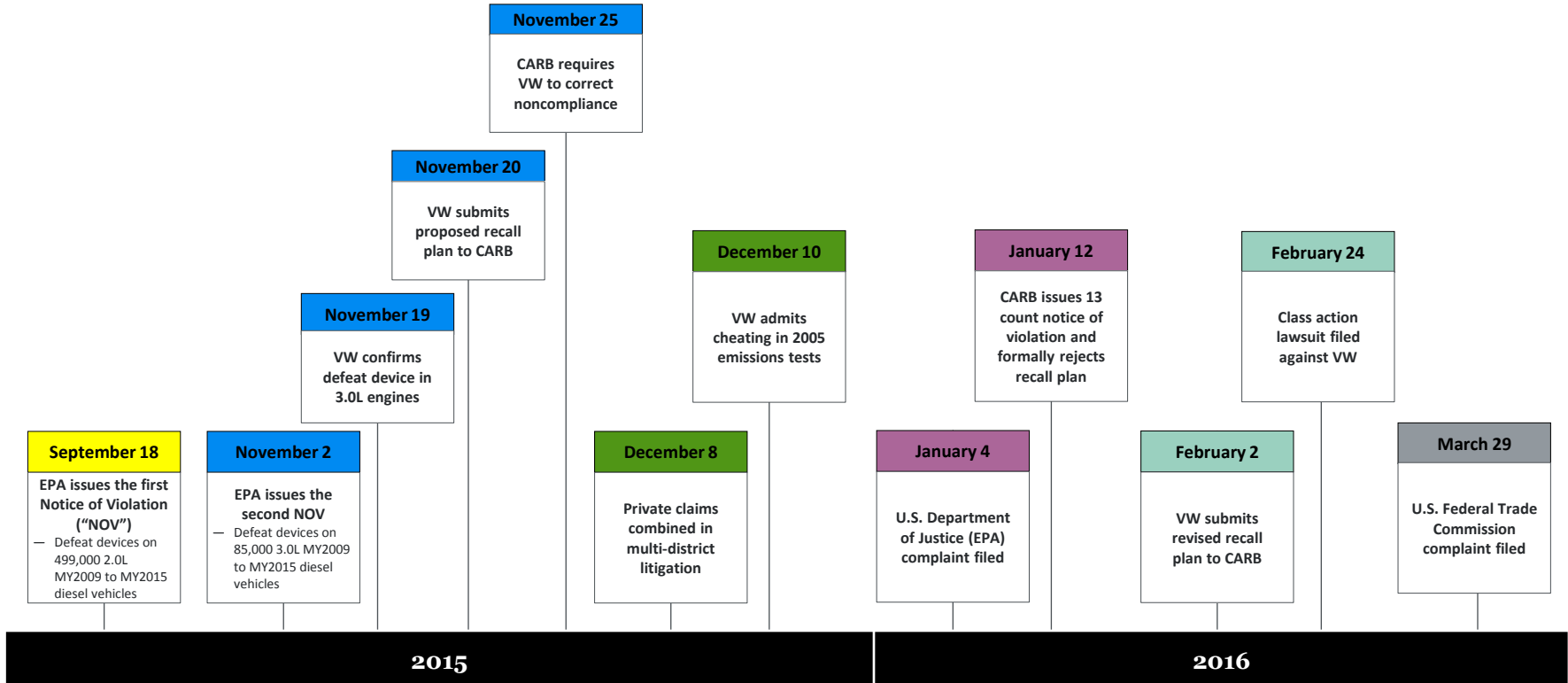
- VW installed software in 2.0L and 3.0L diesel engines to detect when the vehicle was being tested for emission certification
 - During testing, the software activated full emissions controls to pass
 - During normal operation, the software reduced emissions controls to improve power and fuel economy
- As a result, during normal driving conditions:
 - 2.0L vehicles: NOx emissions up to 40x higher than EPA's legal limit
 - 3.0L vehicles: NOx emissions up to 9x higher than EPA's legal limit

Basic Facts (cont'd)

How was the issue discovered?

- In May 2014, researchers at West Virginia University tested VW vehicles using Portable Emissions Measurement System (“PEMS”) equipment
- Discovered high emissions levels during normal operation
- 11 million vehicles impacted worldwide starting with MY2009
 - Approximately 600,000 in the U.S.

Enforcement Timeline



Alleged Violations

EPA Claims Against VW

1. Selling vehicles not covered by COCs
 - COC did not include the defeat device software
 2. Installing defeat devices in 2.0L and 3.0L diesel engines
 - Software reduced emissions controls under normal driving conditions
 3. Tampering with emissions controls
 - Alleged that VW rendered emissions controls inoperative
 4. Failing to report Clean Air Act violations
- Criminal investigation pending

Settlement

Known and Estimated Costs to VW

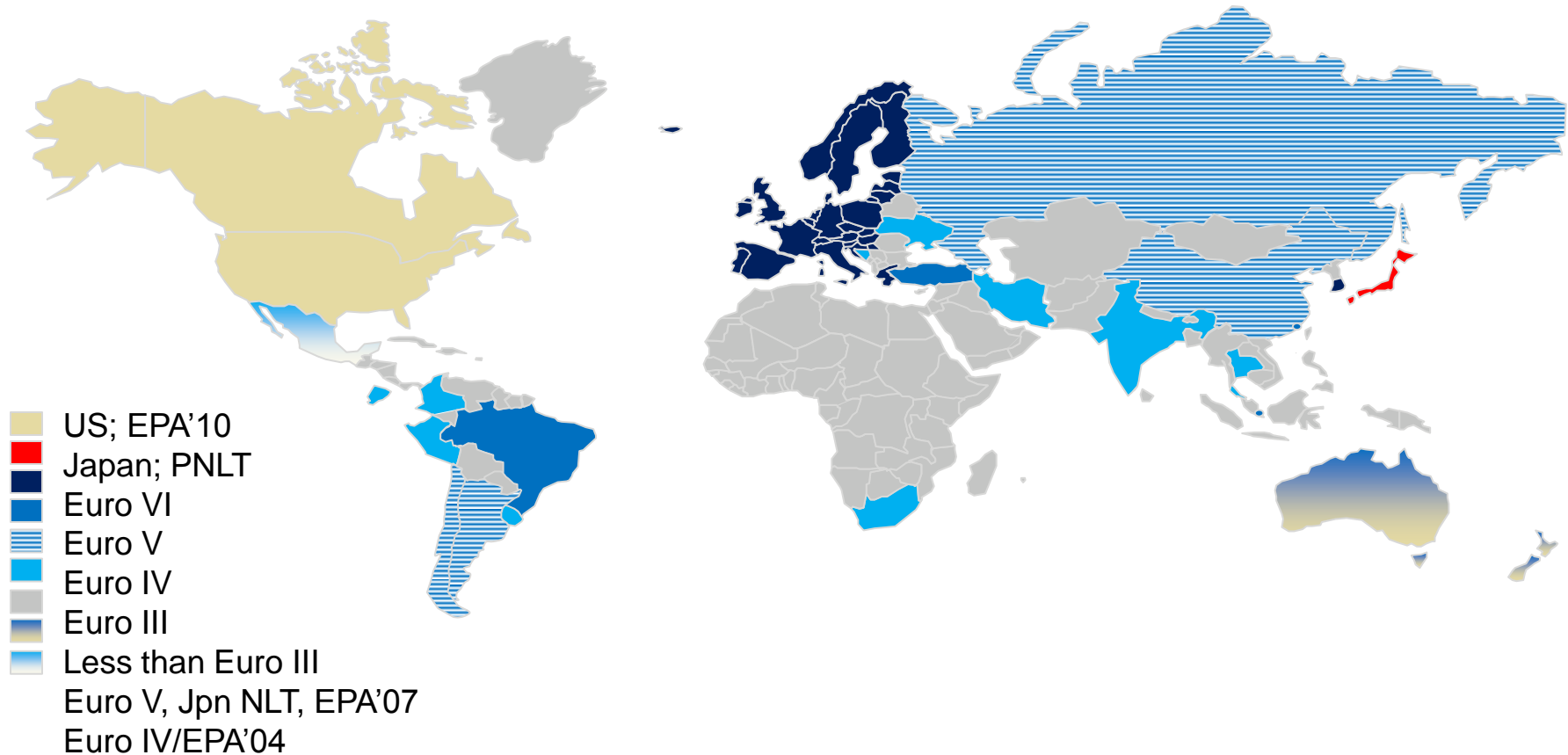
- \$14.7 Billion settlement with DOJ, EPA, FTC (June 28)
 - Owners of 2.0L engine vehicles choose between buy-back or retrofit
 - Compensation between \$12,500 - \$44,000 per vehicle
 - Consent decree requires VW to remove or modify at least 85% of the 2.0L vehicles
 - VW will create a \$2.7 billion fund for state and tribal projects to reduce NOx emissions.
 - \$2 billion in investments in clean technology (zero-emissions vehicles) to offset increased emissions
- Civil penalties still unknown
 - Up to \$37,500 per violation per vehicle per day
 - Estimated cost: additional \$1 Billion
- No resolution yet for claims regarding the 3.0L engine vehicles
- No resolution yet for criminal liability

Settlement (cont'd)

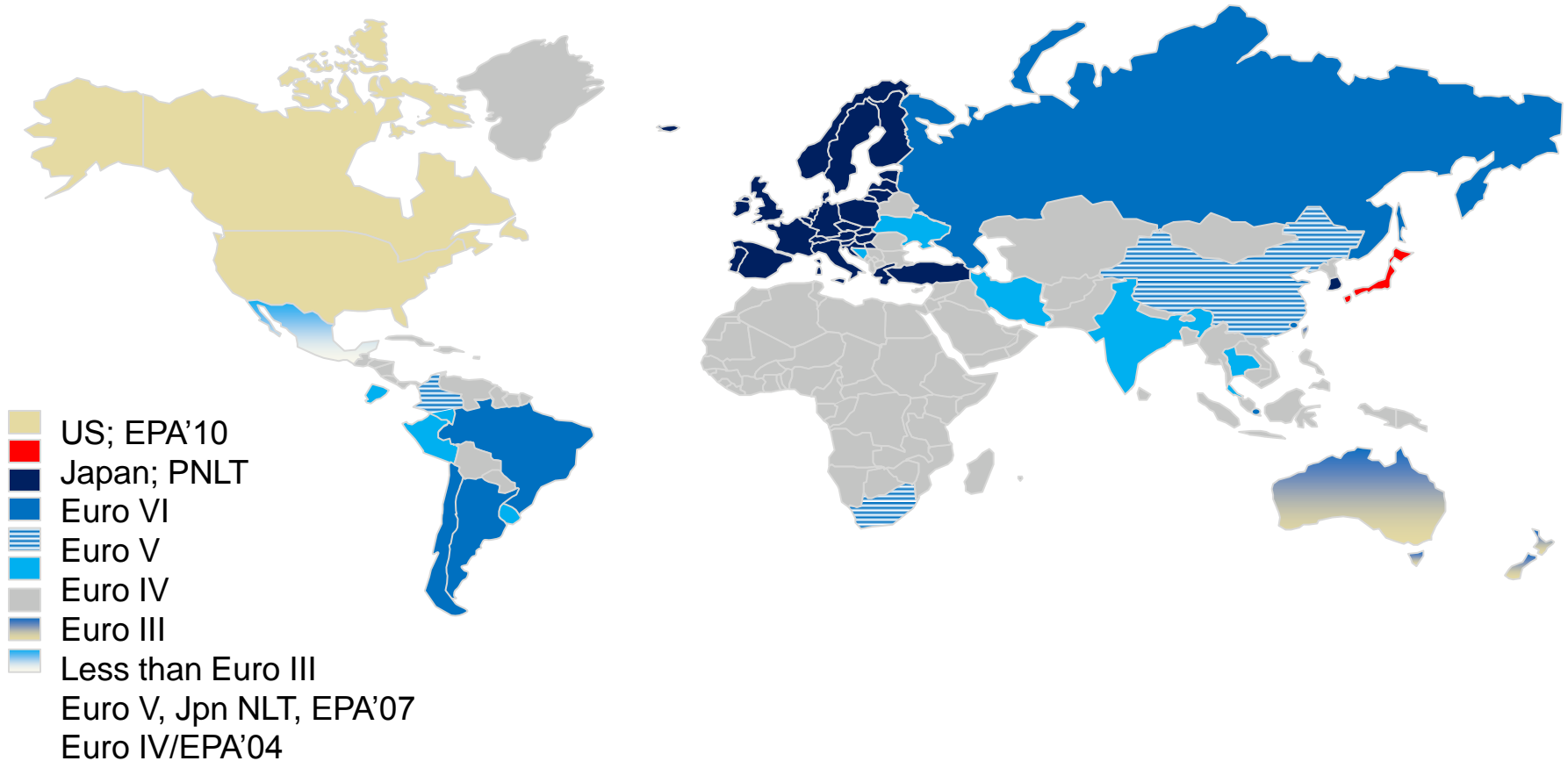
VW's Admission

“Software in the 2.0 Liter Subject Vehicles enables the vehicles’ ECMs to detect when the vehicles are being driven on the road, rather than undergoing Federal Test Procedures, and that this software renders certain emission control systems in the vehicles inoperative when the ECM detects the vehicles are not undergoing Federal Test Procedures, resulting in emissions that exceed EPA-compliant and CARB-compliant levels when the vehicles are driven on the road.”

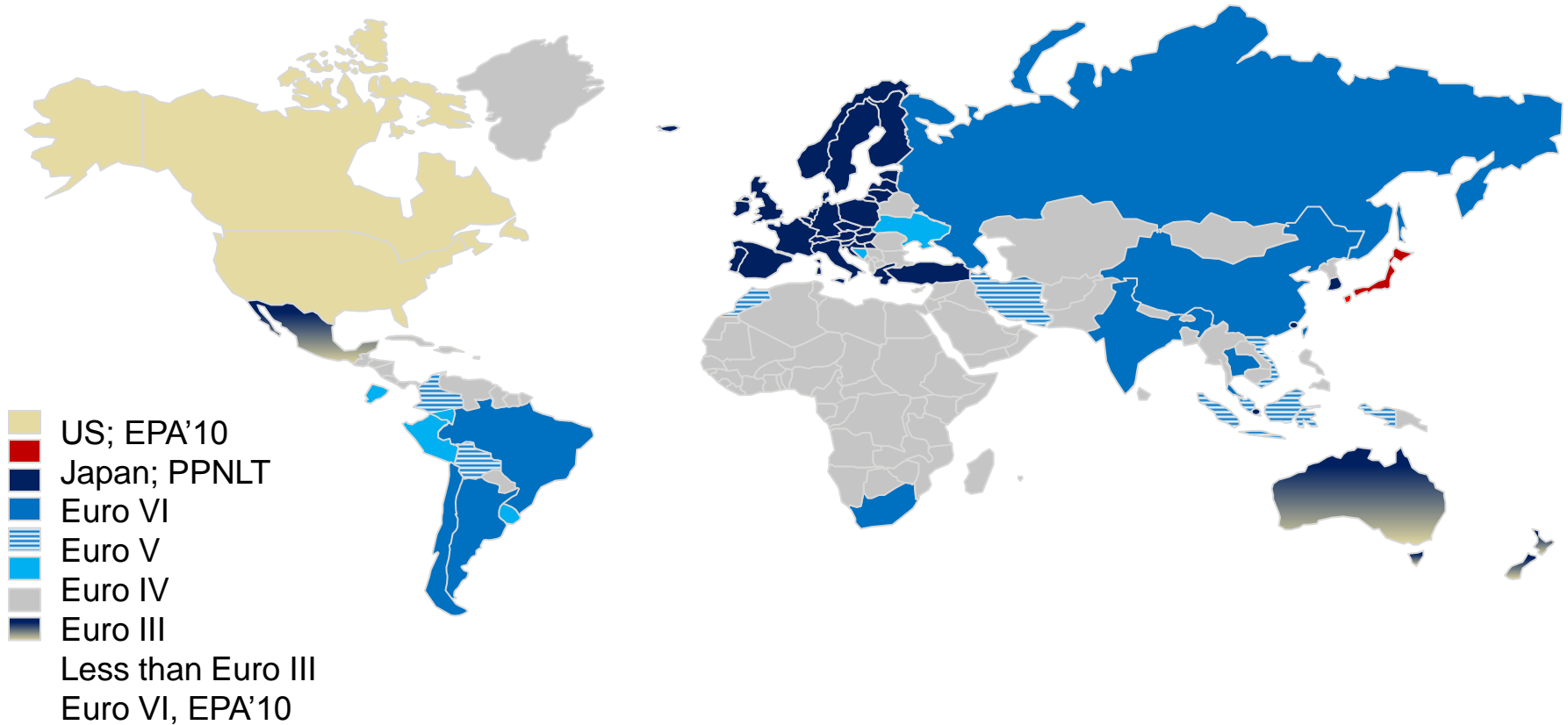
Global Picture: Emissions Regulations 2014



Global Picture: Emissions Regulations 2015



Global Picture: Emissions Regulations 2020



The logo for Hogan Lovells, consisting of the name "Hogan Lovells" in a black serif font, positioned inside a solid yellow square.

Hogan
Lovells

Basics of the Clean Air Act

Environmental Law Institute

Summer School

Emily Kimball & Mark Foster

July 7, 2016