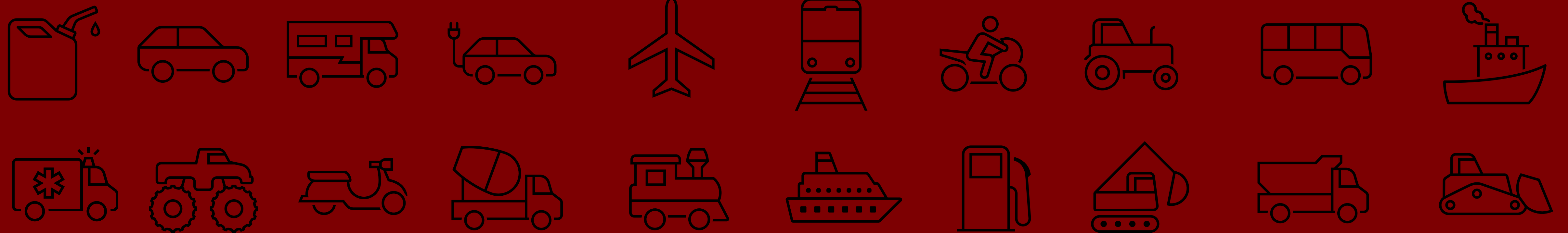


MOBILE SOURCES AND THE CLEAN AIR ACT

Evan Belser

Basics of the Clean Air Act
Environmental Law Institute
June 30, 2022



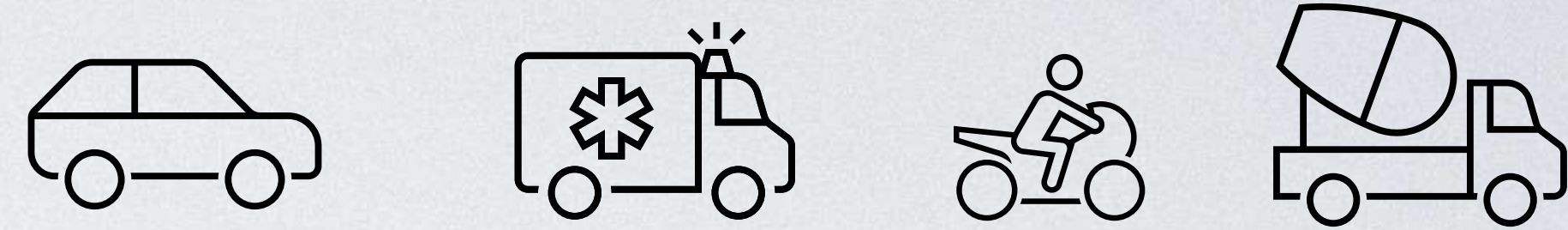
Vehicle & Engine Standards

Direct regulation of **performance**

- Tailpipe emissions
- Evaporative emissions
- Emissions warranty

Direct regulation of **design**

- Onboard Diagnostic System (“check engine light”)
- No “defeat devices” to evade tests
- Labels, consumer disclosures



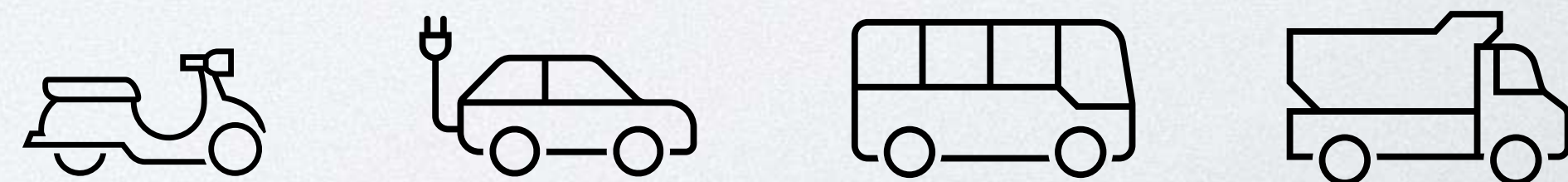
Regulated Pollutants

Carbon monoxide (CO)
Particulate matter (PM)
Hydrocarbons (HC)
Oxides of nitrogen (NO_x)

Greenhouse gases (GHGs) too,
but so far only for light- and
heavy-duty on-road vehicles

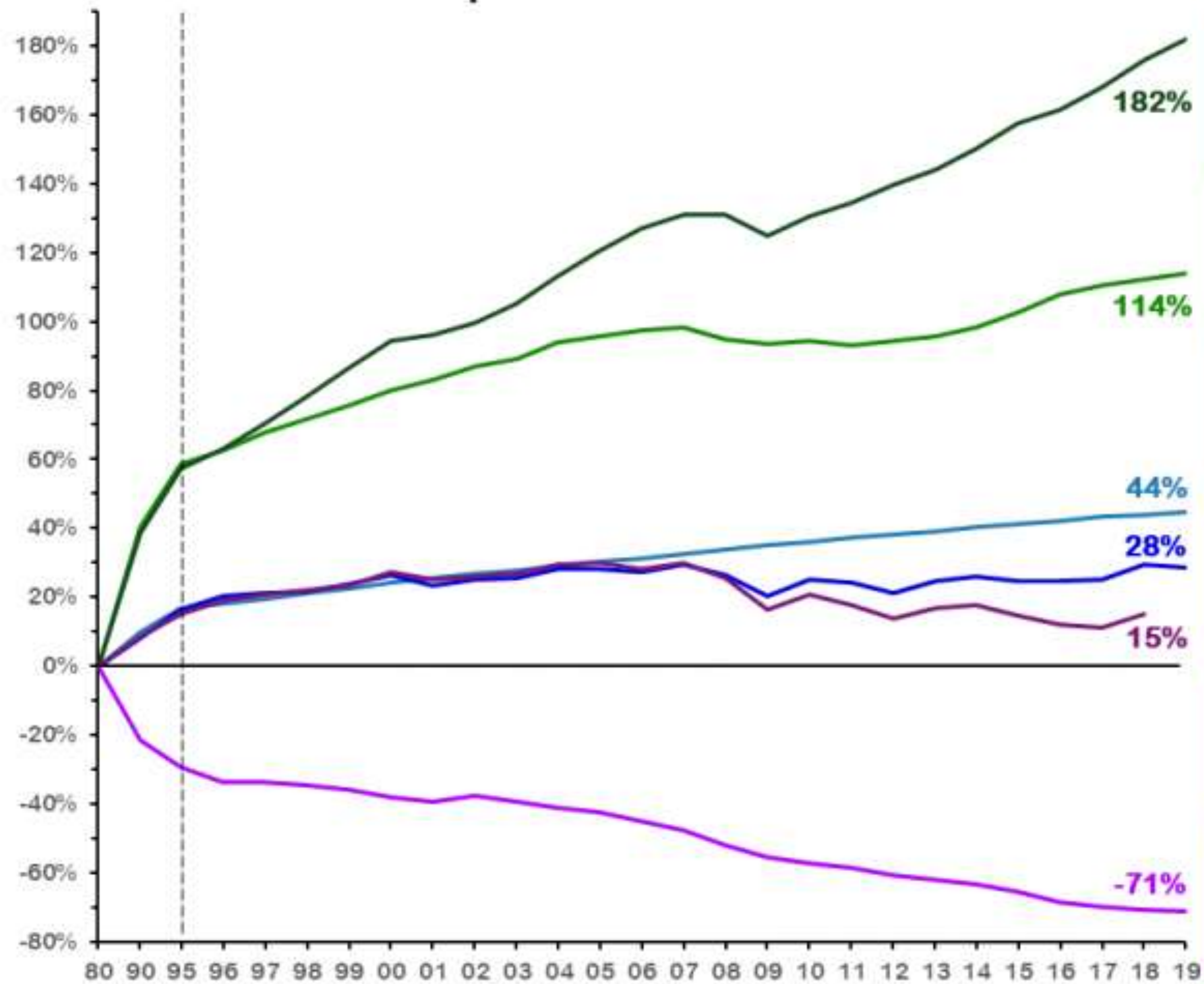
Regulated Sectors

Aircraft
Heavy-duty vehicles
Light-duty vehicles
Locomotives
Motorcycles
Marine engines
Marine auxiliary engines
Nonroad engines and equipment
Recreational engines and vehicles



Comparison of Growth Areas and Emissions, 1980-2019

US EPA



Gross Domestic Product



Vehicles Miles Traveled



Population



Energy Consumption



CO₂ Emissions

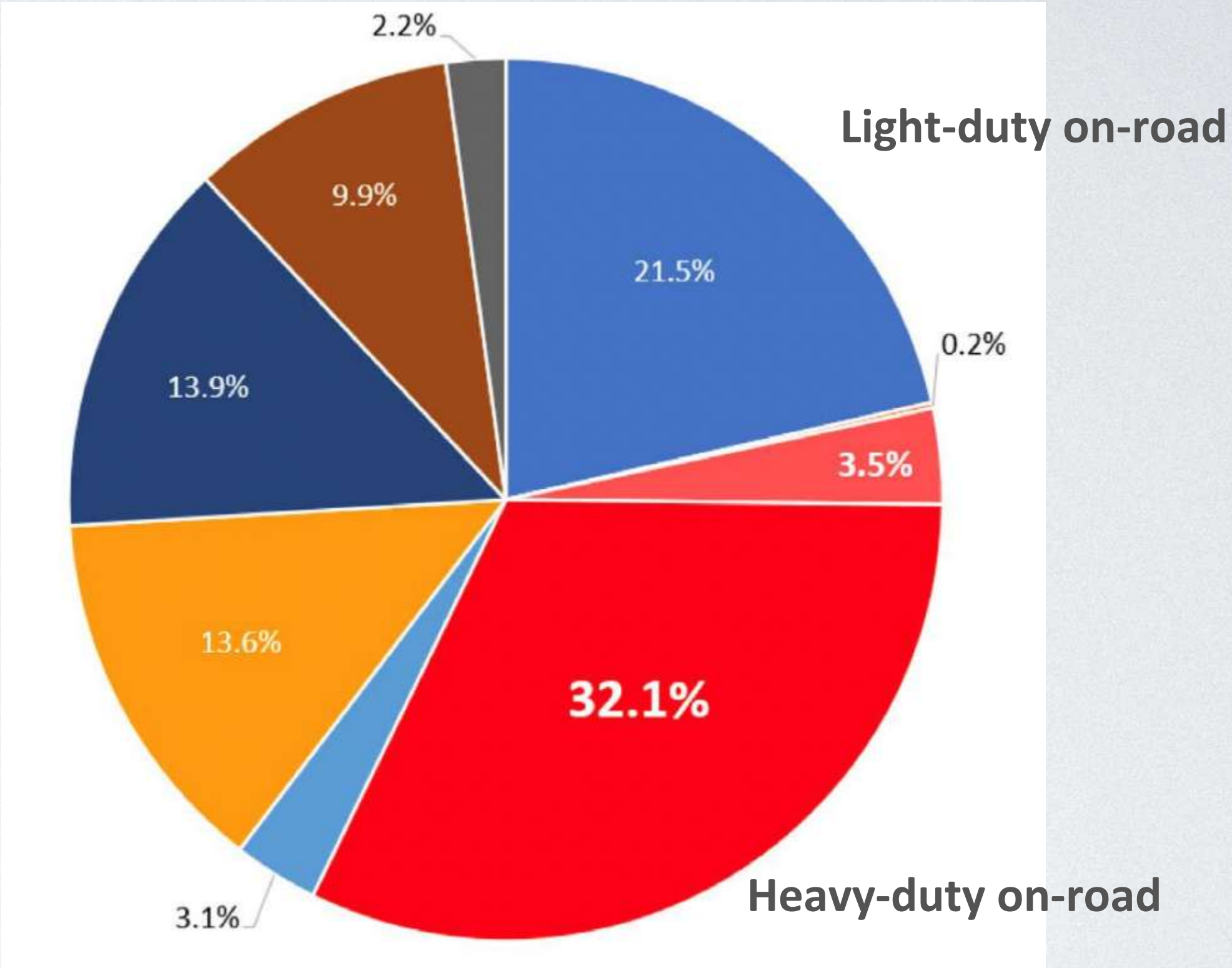
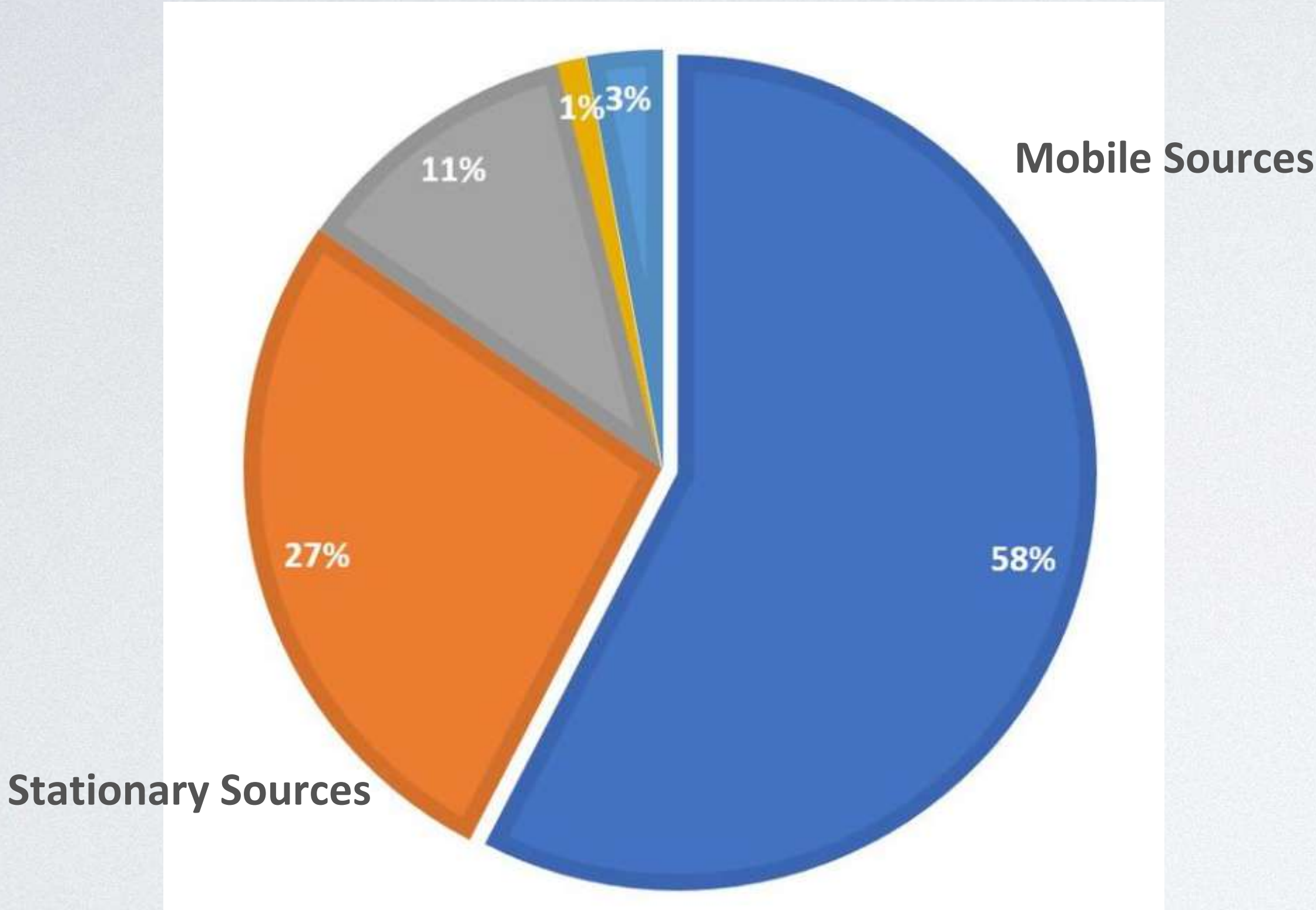


Aggregate Emissions (Six Common Pollutants)

More than Half of US NOx Emissions

NOx (oxides of nitrogen) in US

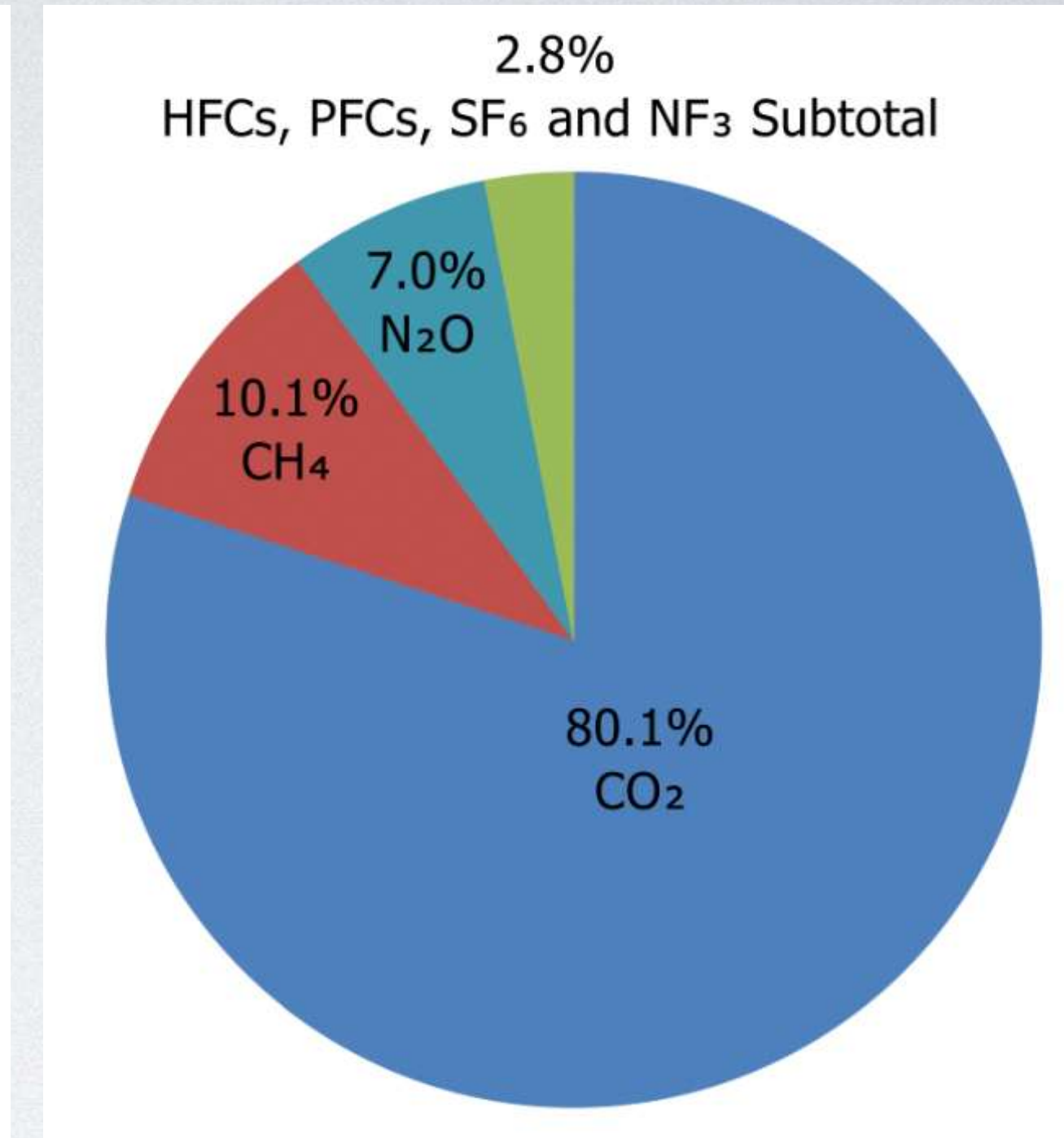
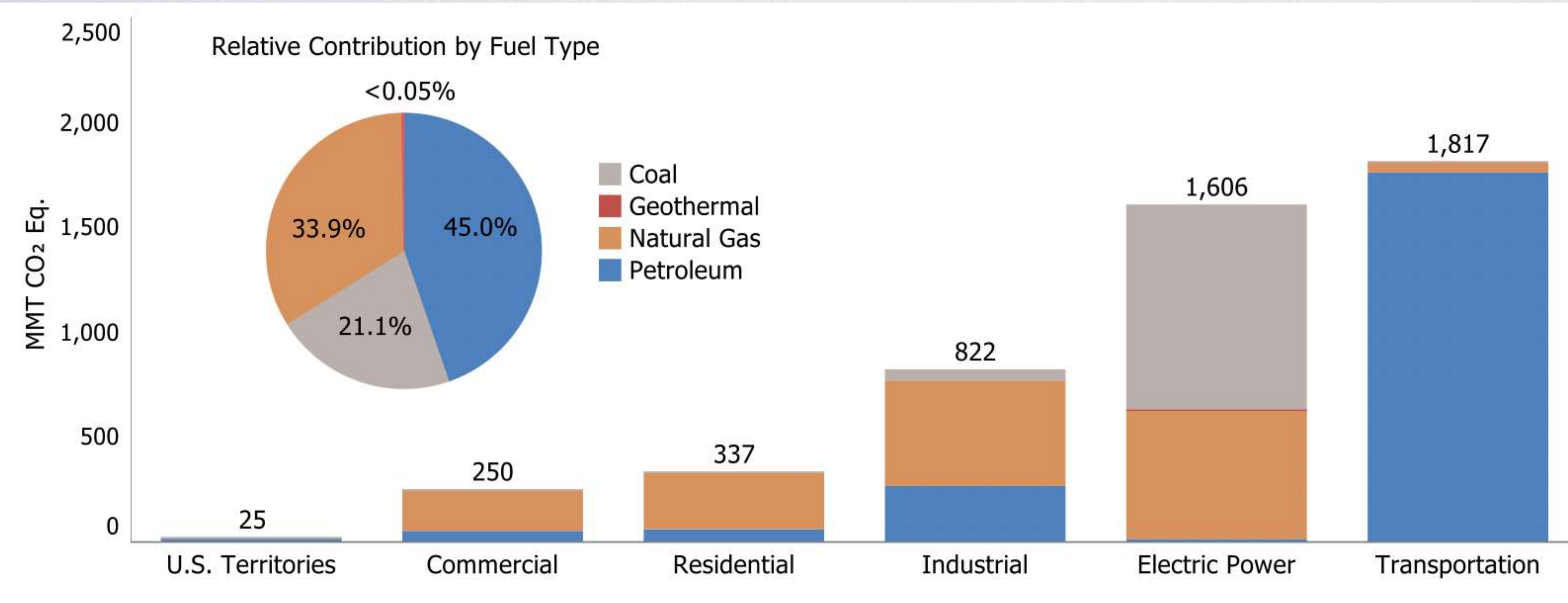
NOx from mobile sources



US EPA, National Emission Inventory Air Pollutant Emission Trends
www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data

US EPA, EPA Announces the “Clean Trucks Plan,” EPA-420-F-21-057 (Aug. 2021)
<https://www.epa.gov/system/files/documents/2021-08/420f21057.pdf>

Transportation is Largest GHG Source



GHG emissions from fossil fuel combustion in the US in 2019 (fossil fuel combustion accounted for 92.4% of emissions)

Relative contribution of GHGs to total US emissions in 2019, weighted by global warming potential

Technology-Forcing Statute

In the engine:

- Meticulous management of combustion
- Exhaust gas recirculation

Body:

- Lighter materials
- Better aerodynamics

After the engine:

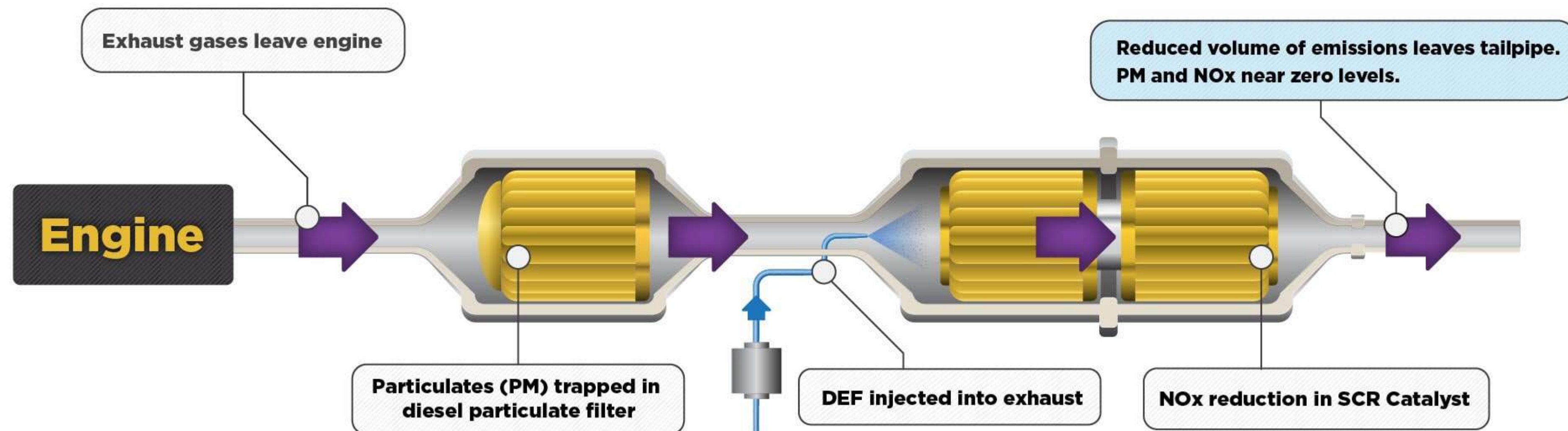
- Catalytic converter
- Diesel particulate filter
- Selective catalytic reduction system

New propulsion

- Electric
- Hydrogen



Diesel Emissions Control System

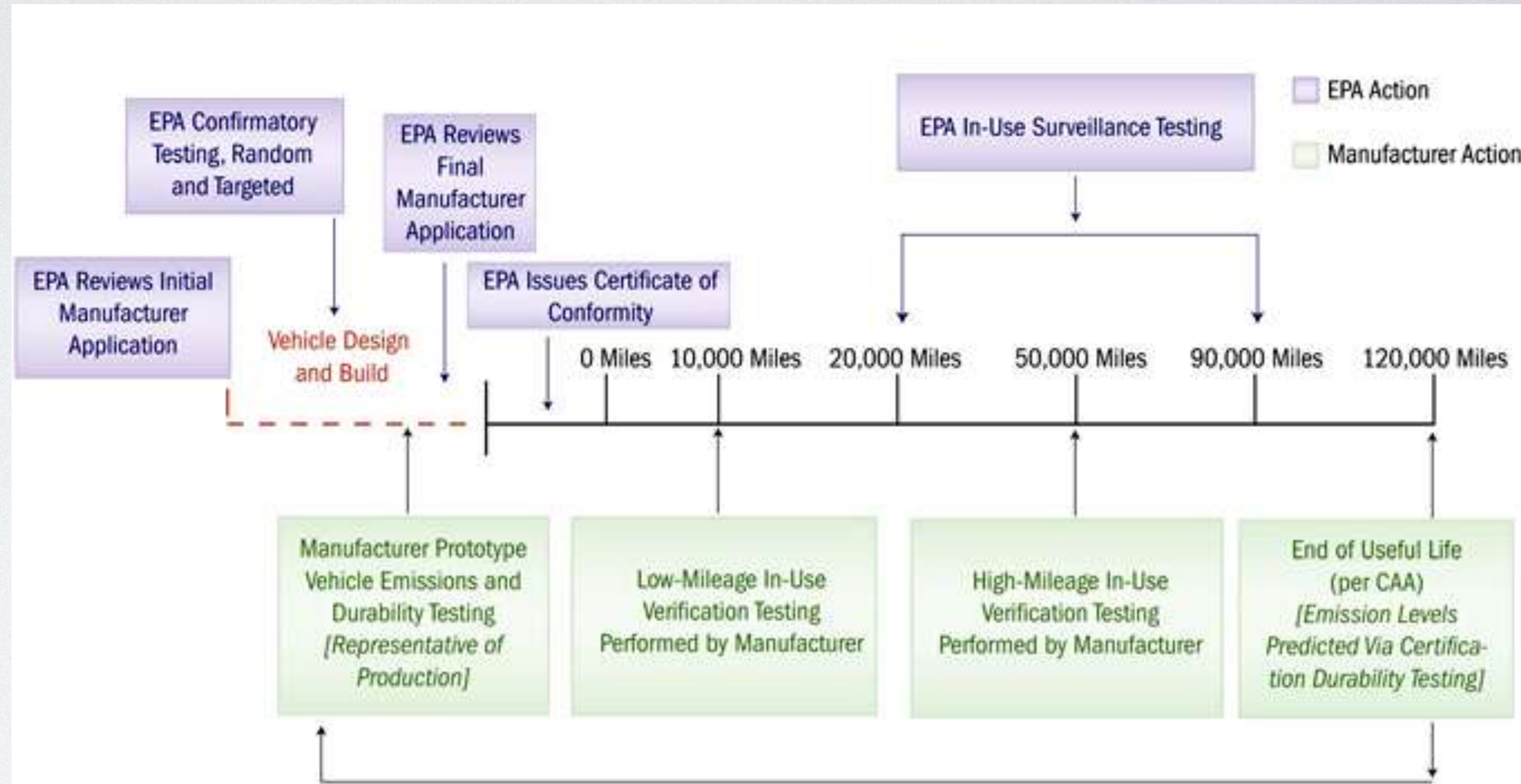


EPA Certification Program

42 U.S.C. §§ 7525, 7541

“Certificate of Conformity”

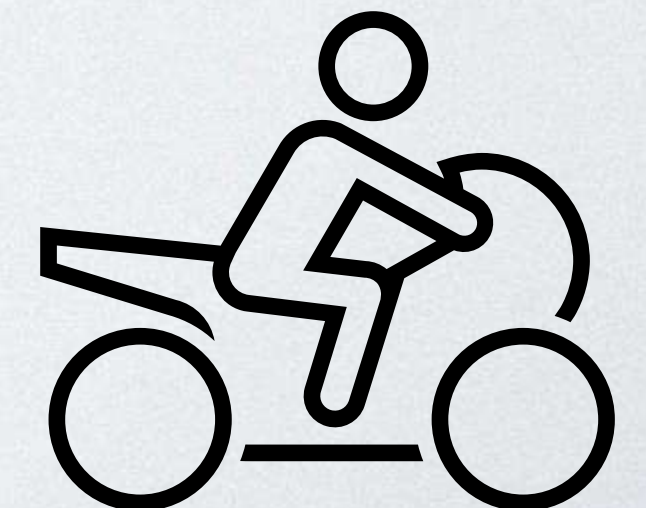
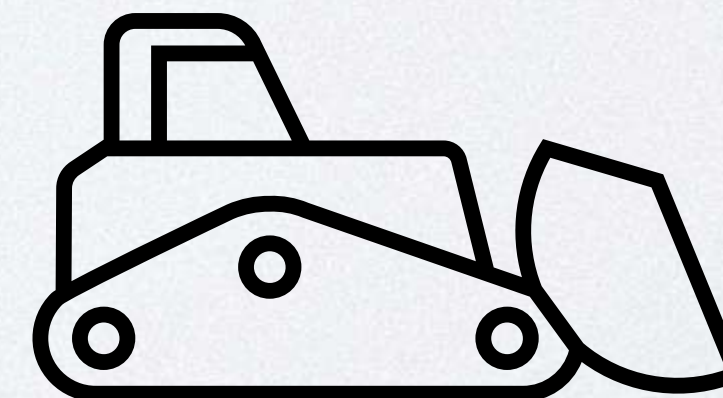
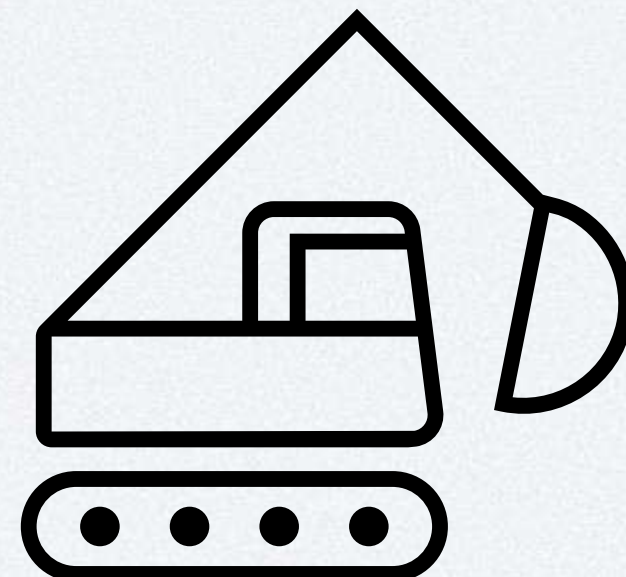
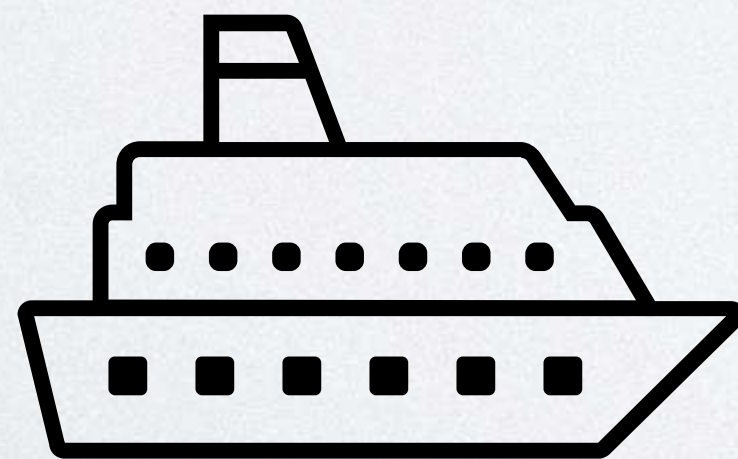
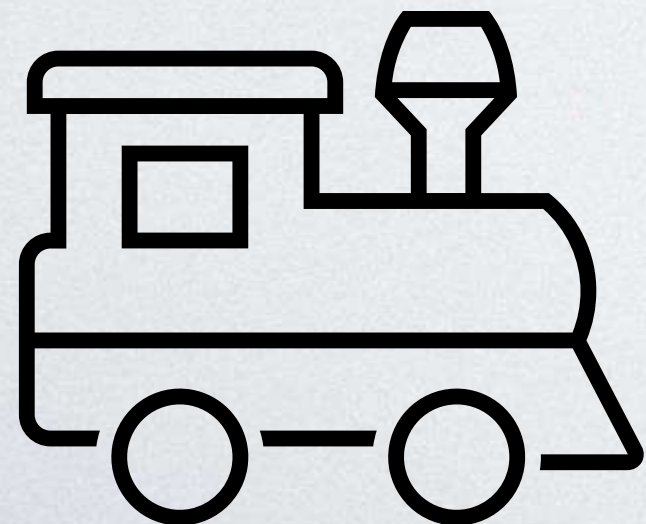
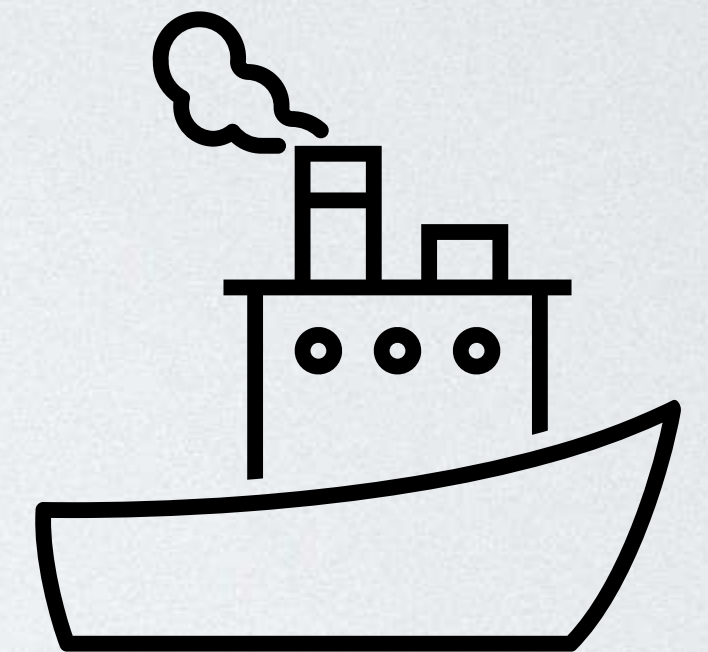
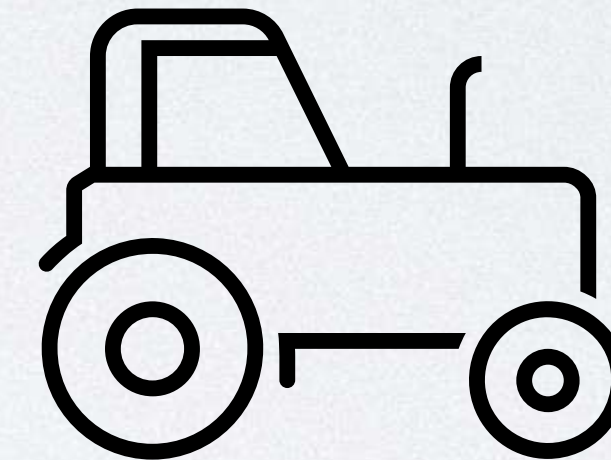
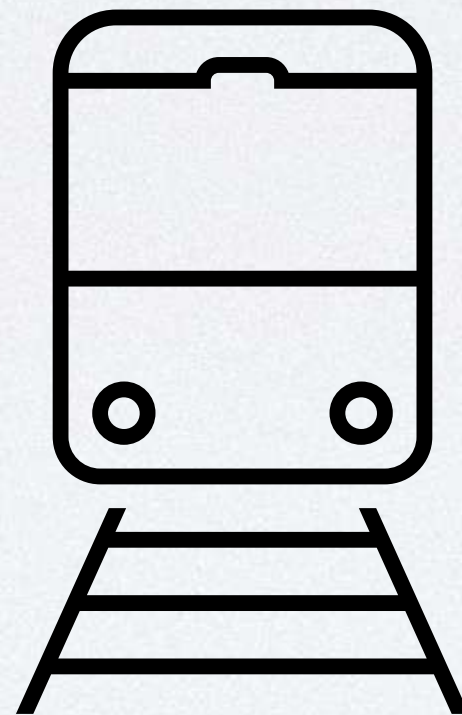
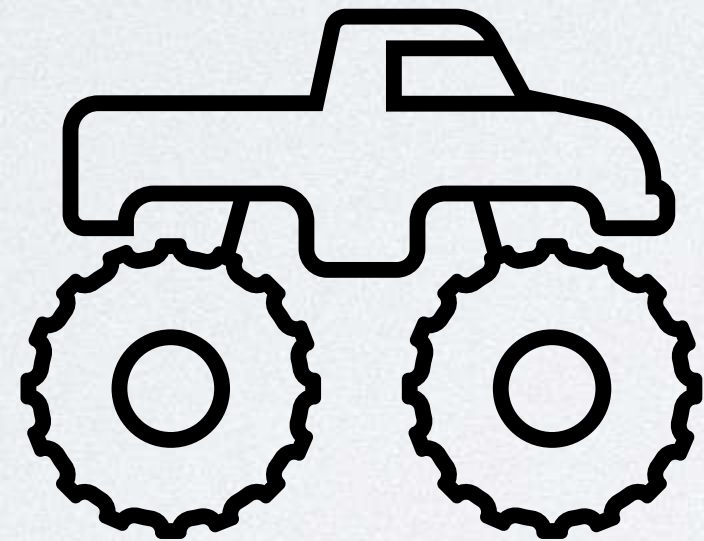
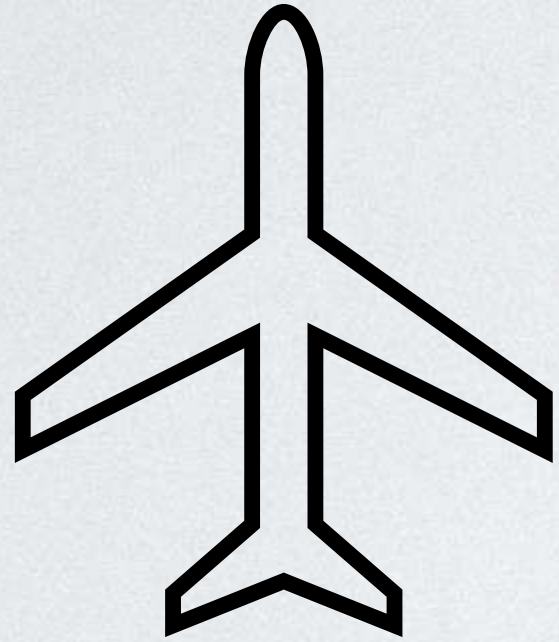
- Every model
- Every model year
- Prescribed test cycles
- Extensive disclosures
- Corporate attestations
- COC covers only those products which conform to the certified configuration

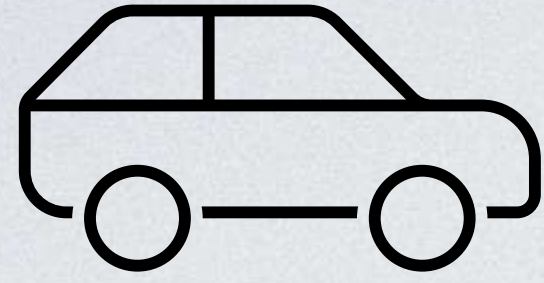


Nonroad Vehicles and Engines

42 U.S.C. § 7547

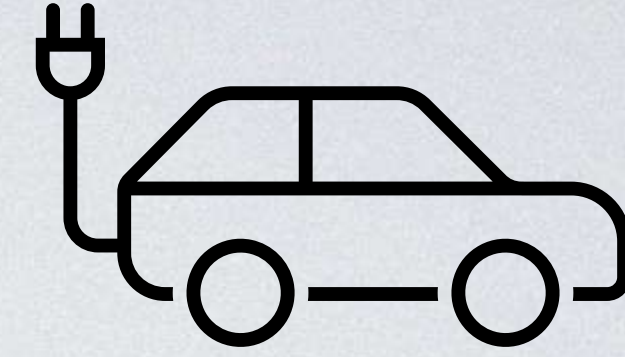
Basically, the same certification paradigm and technology-forcing standards as for “on-road” vehicles and engines





Role for States

42 U.S.C. §§ 7507, 7543



New motor vehicles:

- Express preemption of state standards
- Except California may set standards that are at least as protective, with a waiver from EPA
- Waivers are for specific sectors and model years of vehicles and engines
- Other states can adopt California's standards (the "§ 177 states")
- *Ohio v. EPA* (DC Cir) (2022 challenge to waiver for CA GHG programs)

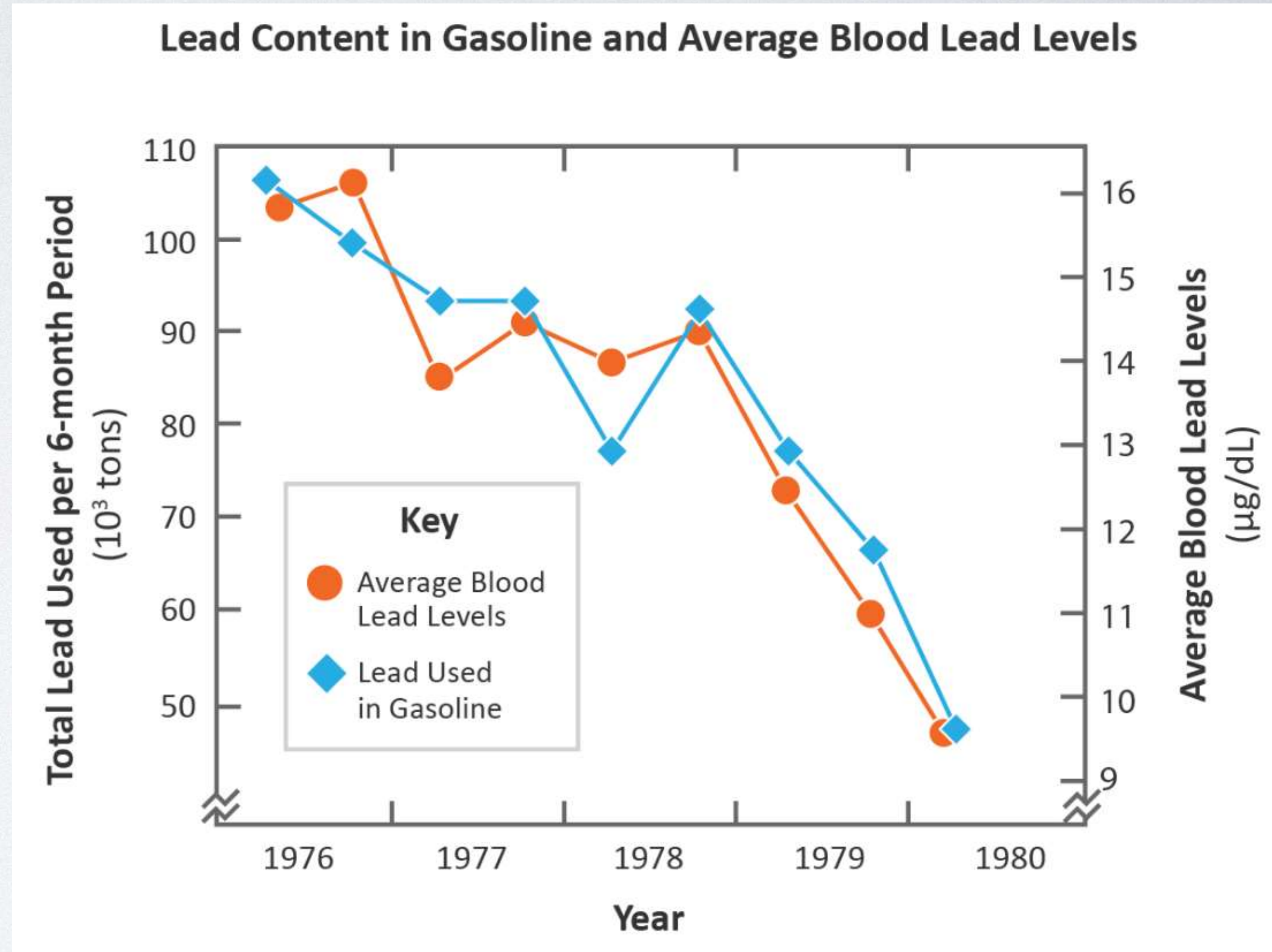
In-use motor vehicles:

- Express savings clause: states retain authority to "control, regulate, or restrict the use, operation, or movement of registered or licensed motor vehicles."
- Inspection & Maintenance programs ("smog check")
- California's "truck and bus" rule
- Since *US v. Volkswagen* (2016-17), environmental enforcement

Conventional Fuel Standards

42 U.S.C. § 7545

- Sulfur standards enable the use of advanced catalysts on vehicles, reducing ground-level ozone and particulate matter
- Air toxics standards, especially benzene
- Reid vapor pressure requirements reduces evaporative emissions
- Reformulated gasoline requirements allow for cleaner combustion
- Winter oxygenates required to improve combustion in cold weather



Renewable Fuel Standard (RFS) Program

42 U.S.C. § 7545(o)

Market-based program by which renewable fuel producers generate credits (“RINs”) and petroleum companies must acquire and retire RINs. EPA sets overall volume requirements for various types of renewable fuel based in part on lifecycle GHG analysis.



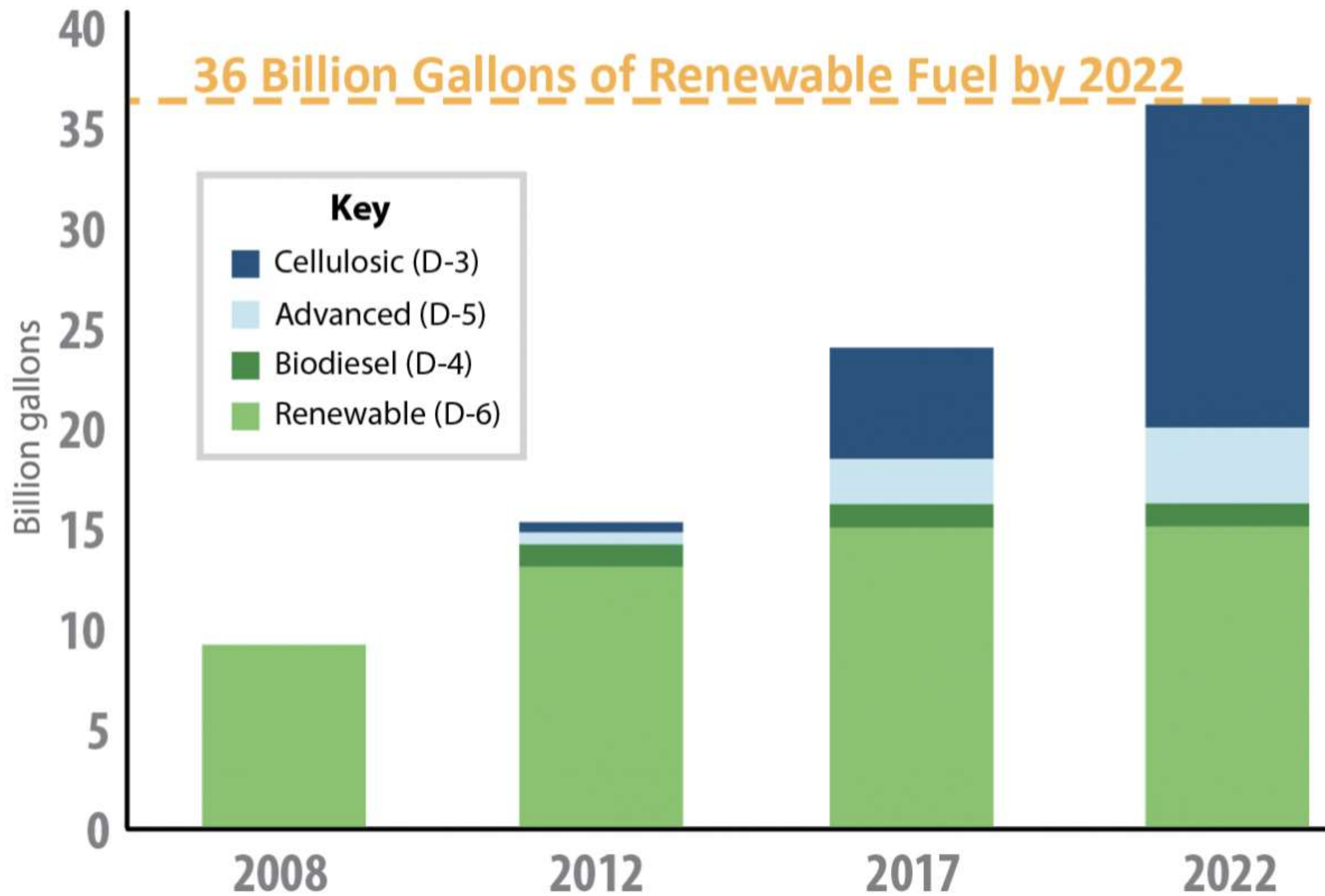
USDA



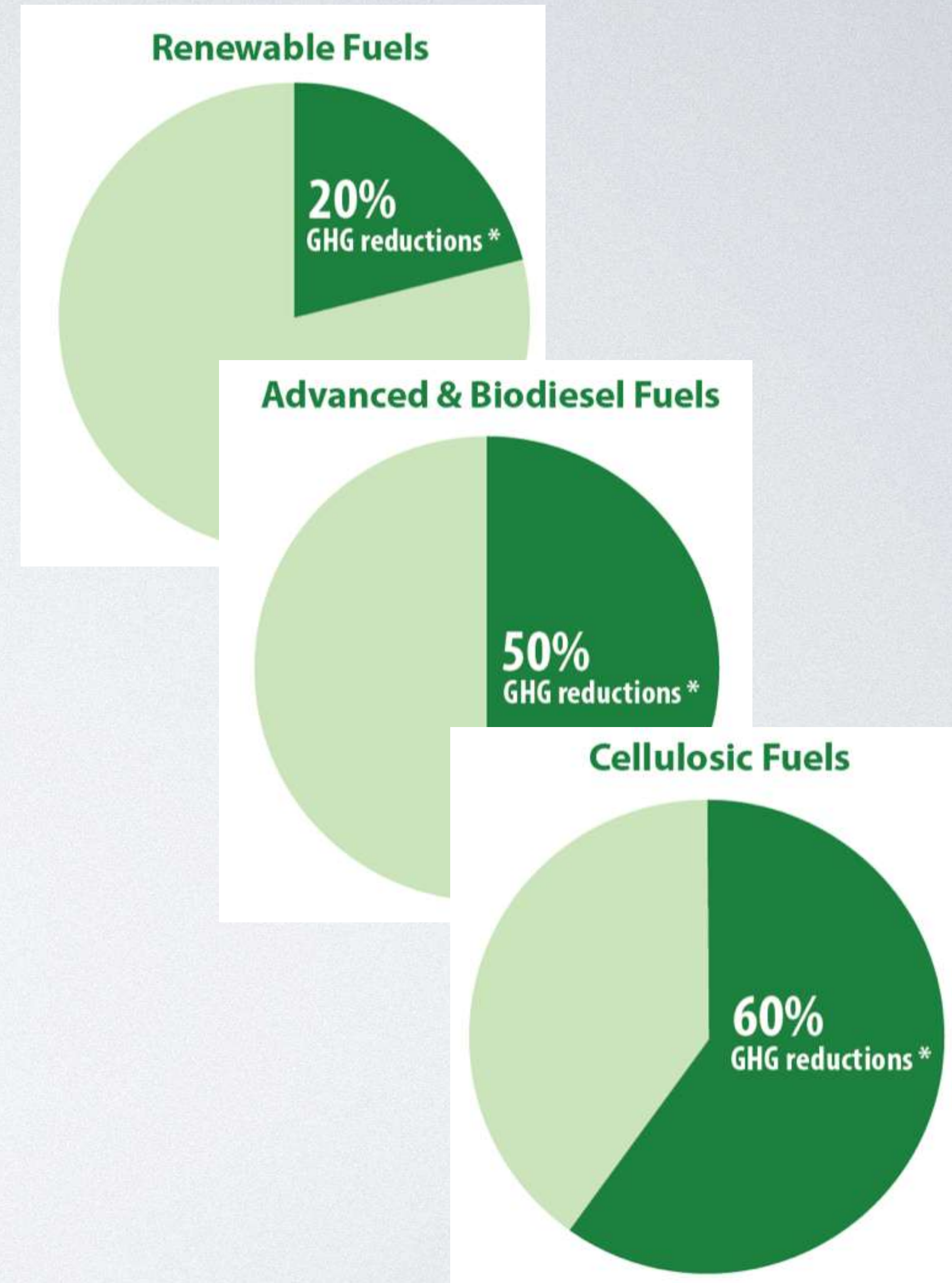
Biofuels International

Multiple-billion dollar market where the traded commodity is necessary for compliance with federal law

Congressional Volume Target for Renewable Fuel



Lifecycle GHG Emissions compared to 2005 petroleum baseline



INVENTORY OF ENFORCEABLE FEDERAL GHG STANDARDS AND PROGRAMS

Title II, Clean Air Act, 42 USC §§ 7521 - 7590

Vehicles and Engines

Light-duty motor vehicles

(e.g., passenger cars and light trucks)

40 CFR Parts 19, 86, 600, 1066

- GHG standards for new motor vehicles; stated in terms of grams/mile; automakers must comply on a fleet-wide basis using a production-weighted average
- Since model year 2012
- In 2021, EPA proposed GHG emissions standards for model years 2023 - 2026



Heavy-duty motor vehicles/engines

(e.g., trucks and buses)

40 CFR Part 1036, 1065, 1066, 1068

- GHG standards for new vehicles/engines; stated in terms of grams per brake horsepower-hour; manufacturers must comply on a fleet-wide basis using a production weighted average
- Since model year 2014
- Soon:
 - lower NO_x standard for model year 2027
 - update of current GHG standards to capture market shifts to zero-emission technologies.
 - Then, tougher GHG standards as soon as model year 2030

Clean Air Act section 211, 42 USC § 7545; 40 CFR Part 80, subpart M

Renewable Fuel Standard (RFS) Program

Market-based program by which renewable fuel producers generate credits (“RINs”) and petroleum companies must acquire and retire RINs. EPA sets overall volume requirements for various types of renewable fuel based in part on lifecycle GHG analysis.



USDA



Biofuels International

Multiple-billion dollar market where the traded commodity is necessary for compliance with federal law

Stationary Sources

Methane from oil and gas

Clean Air Act sections 111(b) and 111(d); 42 USC §§ 7411(b) and 7411(d); 40 CFR Part 60 subparts OOOO, OOOOa, OOOOb, OOOOc; and, as applicable, state and federal implementation plans, new source review, prevention of significant deterioration, and Title V permitting

- Performance standards for new and existing sources in the production, processing, transmission, and storage of natural gas.
- The oil and natural gas industry is the largest industrial source of methane

GHG Reporting Program

40 CFR Part 98

- Requires reporting of GHG information from about 8000 sources

Methane from landfills

40 CFR Part 60 subparts Cc, Cf, WWW, and XXX; 40 CFR Part 63 subpart AAAA; and, as applicable, state and federal implementation plans, new source review, prevention of significant deterioration, and Title V permitting

- Direct regulation of methane and other air pollutants from municipal solid waste landfills.
- Operators must collect emissions from landfills, which is about half methane, and destroy it or use it as fuel.

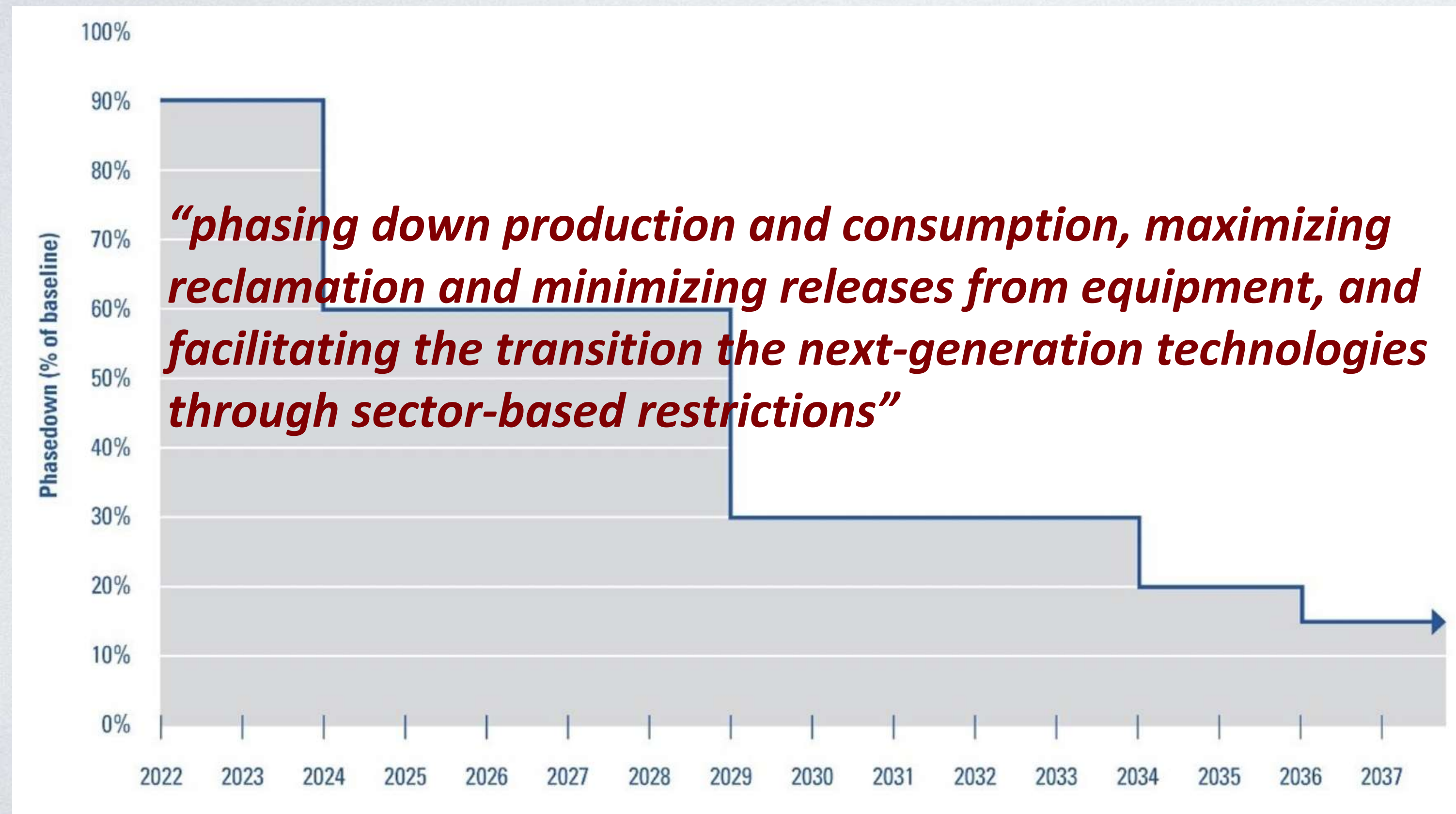
~~**Clean Power Plan**~~

~~**Affordable Clean Energy Rule**~~

Fluorinated Chemicals

Hydrofluorocarbons (HFCs)

American Innovation and Manufacturing Act of 2020, 40 CFR Part 84.
Enacted as section 103 in Division S, Innovation for the Environment, of the Consolidated Appropriations Act, 2021 (Pub. L. 116-260).



Ozone-Depleting Substances (ODS)

Title VI of the Clean Air Act, 42 USC § 7671 - 7671q; 40 CFR Part 82; The Montreal Protocol on Substances that Deplete the Ozone Layer

Enforceable regulatory requirements to protect Earth’s ozone layer, including requirements for importing ODS, safe disposal, leak prevention



freon.com

US EPA, Protecting Our Climate by Reducing Use of HFCs, <https://www.epa.gov/climate-hfcs-reduction>