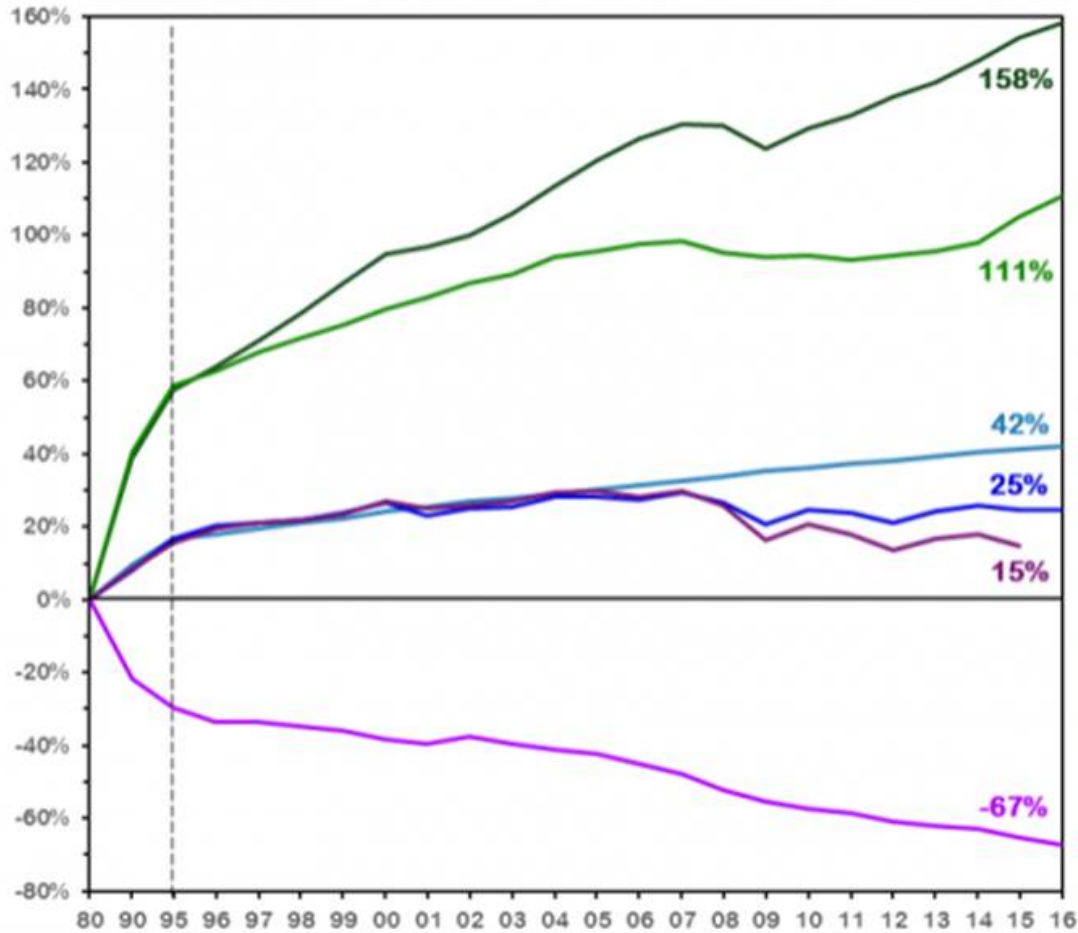


The United States Experience in Using Ethanol Fuels to Meet Clean Air Act Goals

John Mooney, Chief
Air Programs Branch
U.S. EPA Region 5



Comparison of Growth Areas and Emissions, 1980-2016




Gross Domestic Product



Vehicles Miles Traveled



Population



Energy Consumption

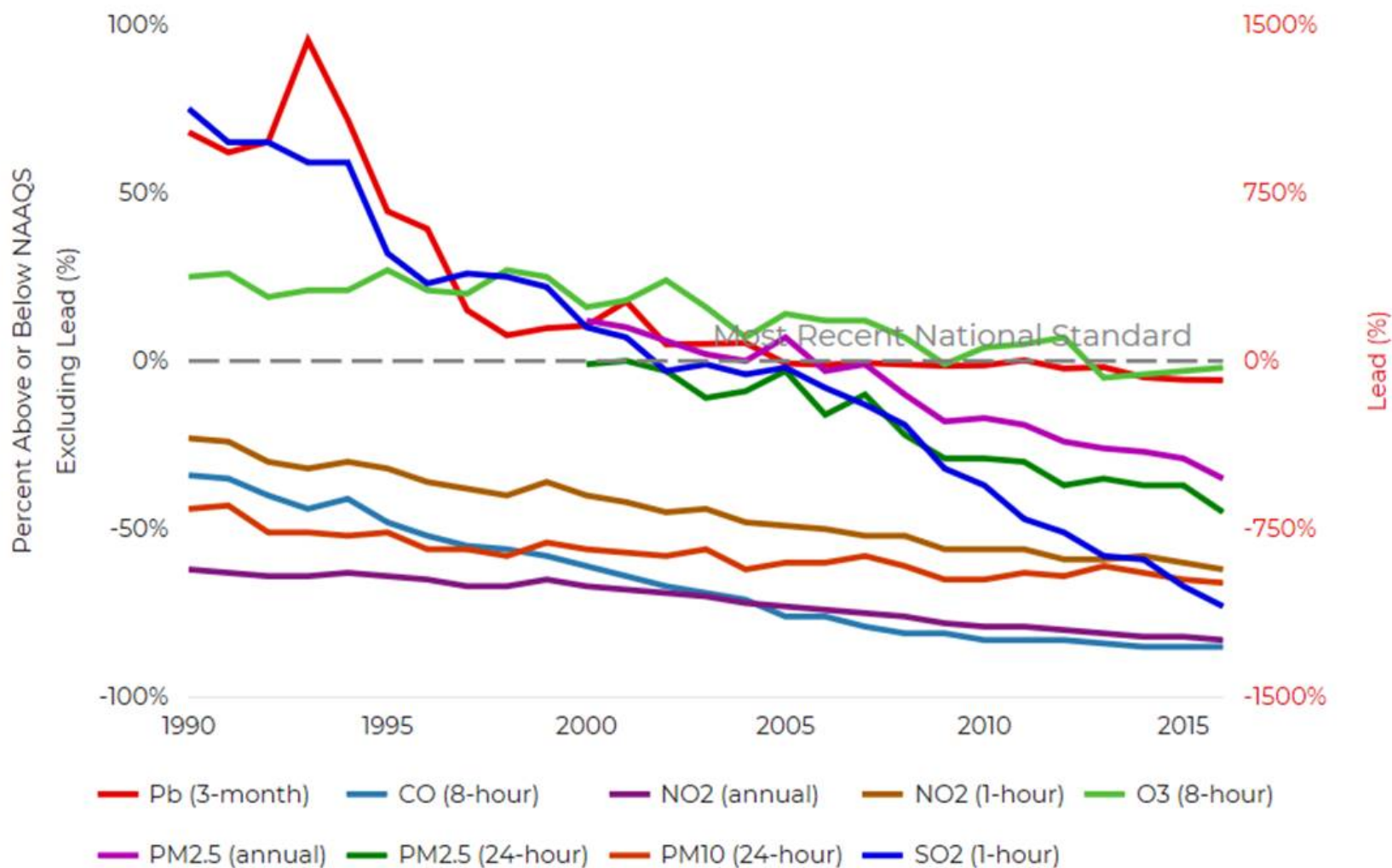


CO₂ Emissions



**Aggregate Emissions
(Six Common Pollutants)**

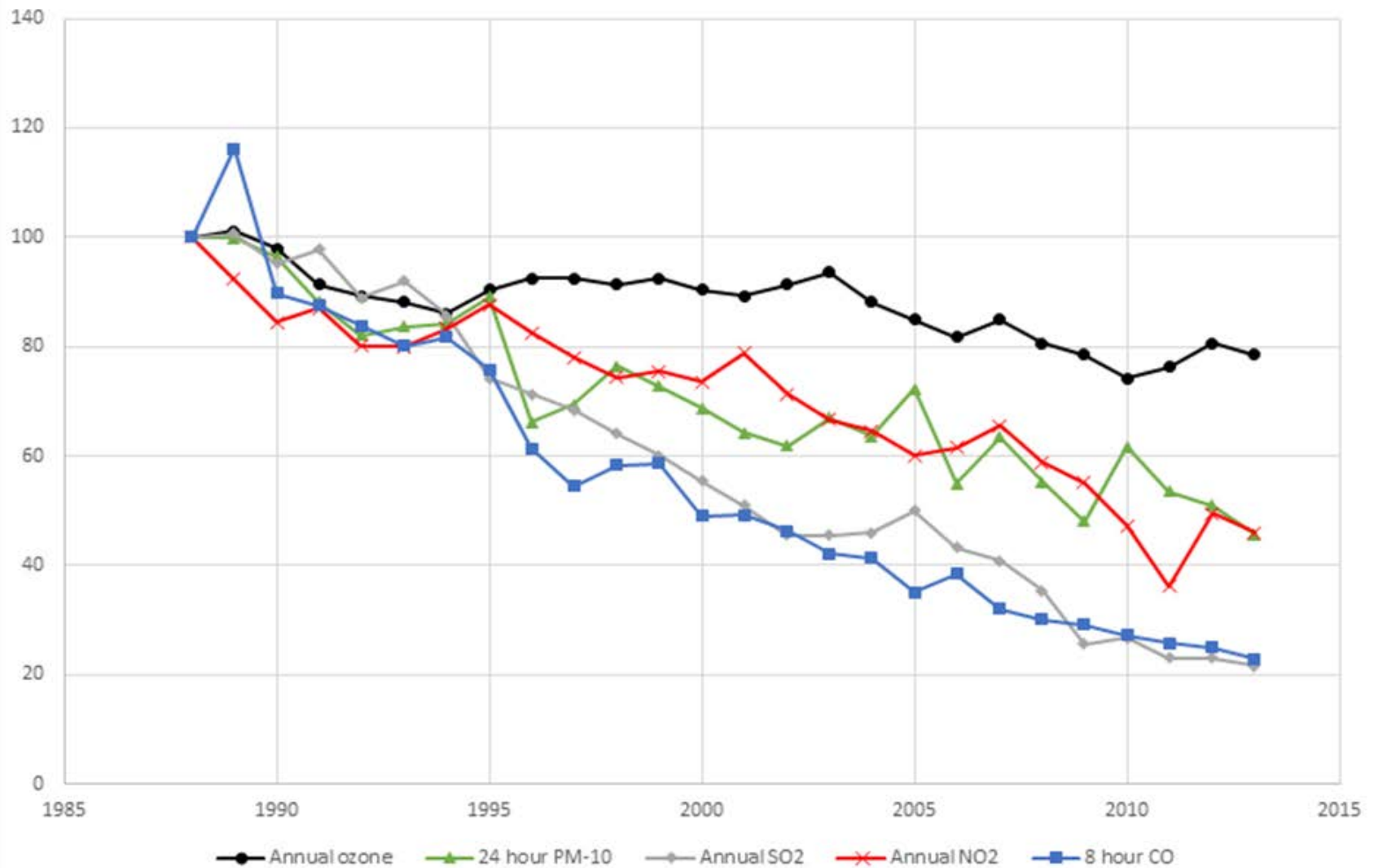
Declining National Air Pollutant Concentration Averages °°°



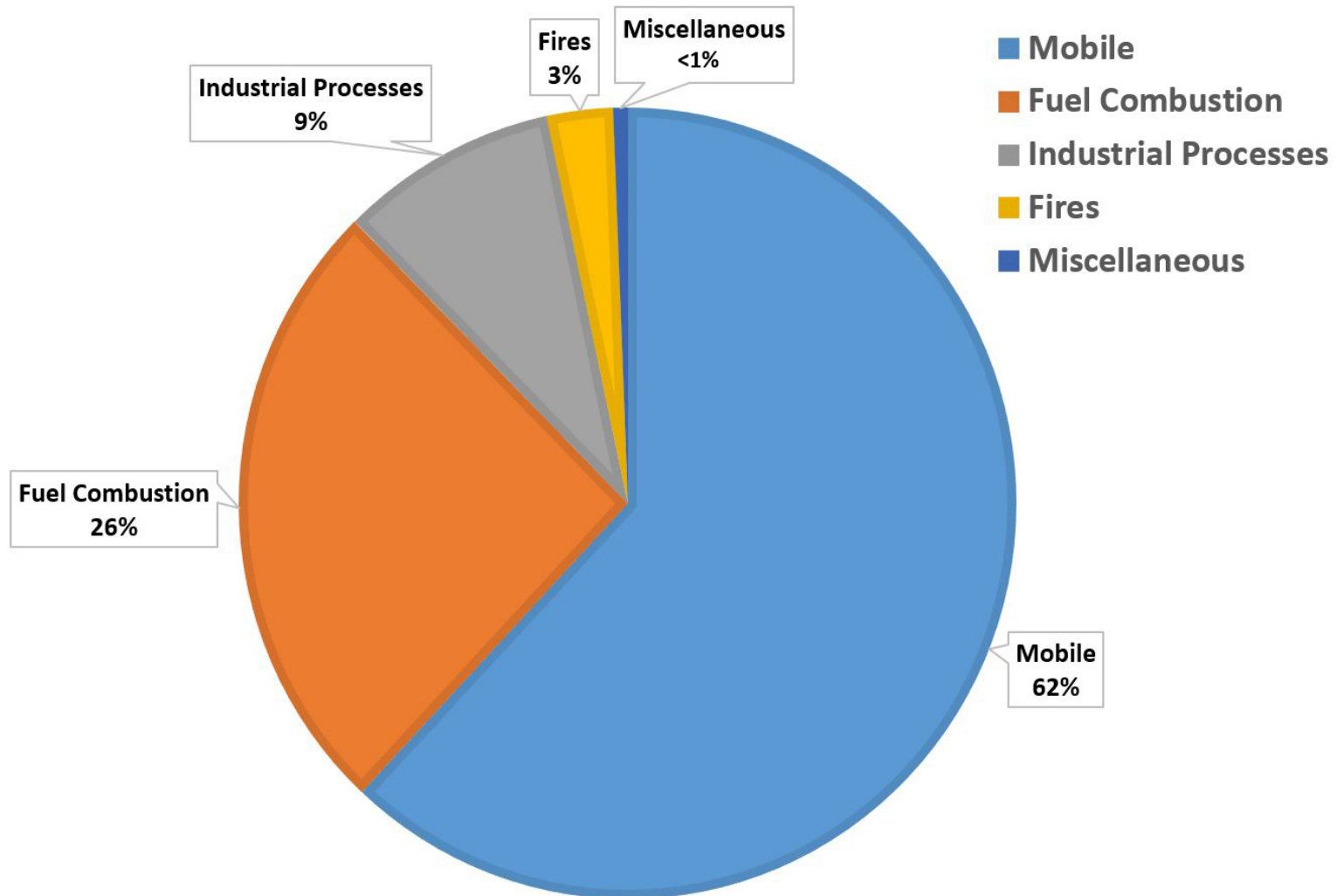
Source: U.S. EPA Air Quality System

Region 5 Air Pollutant Concentration Trends, 1988 - 2013

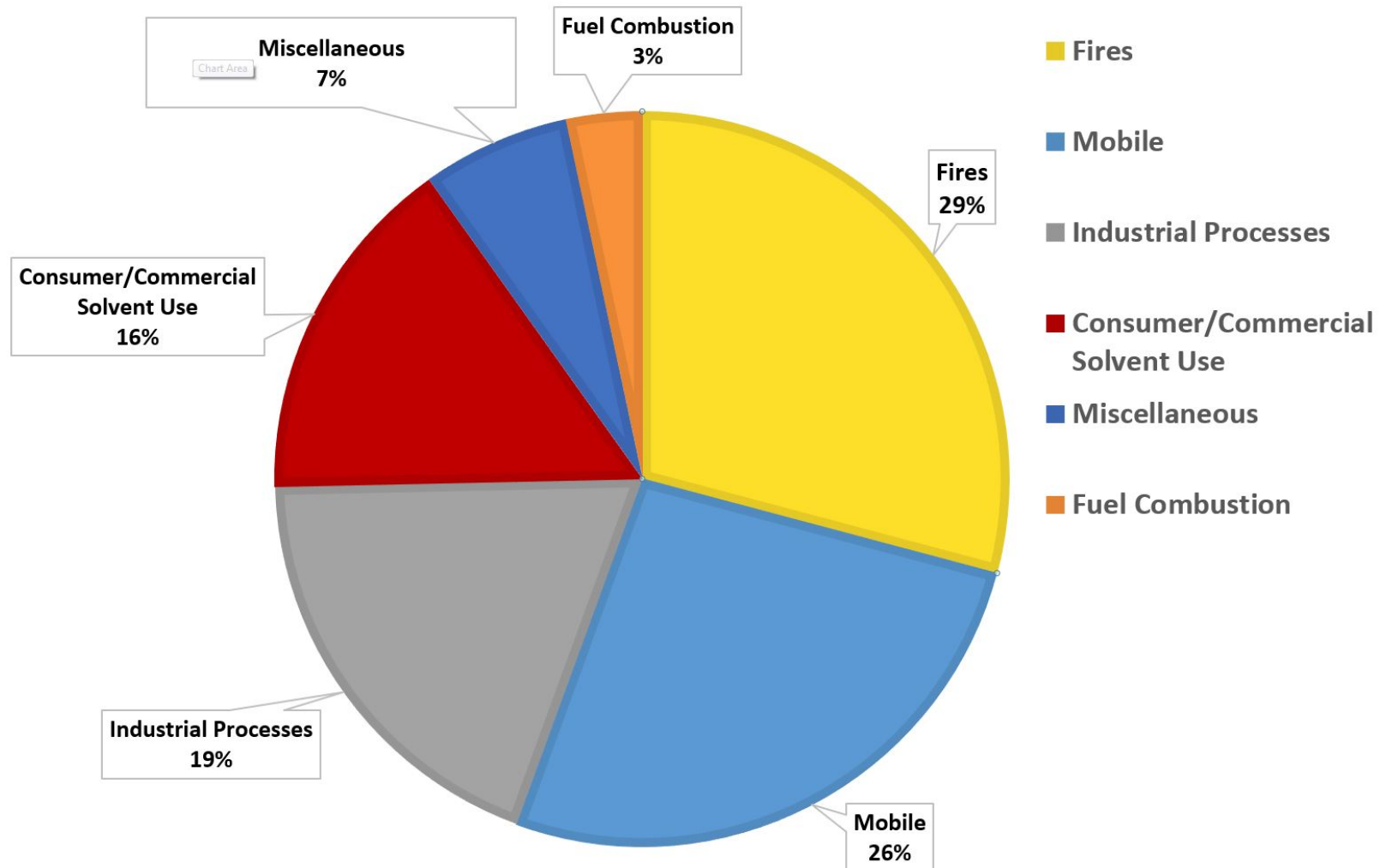
(1988 = 100)



U.S. NO_x Emissions by Sector



U.S. Hydrocarbons Emissions by Sector

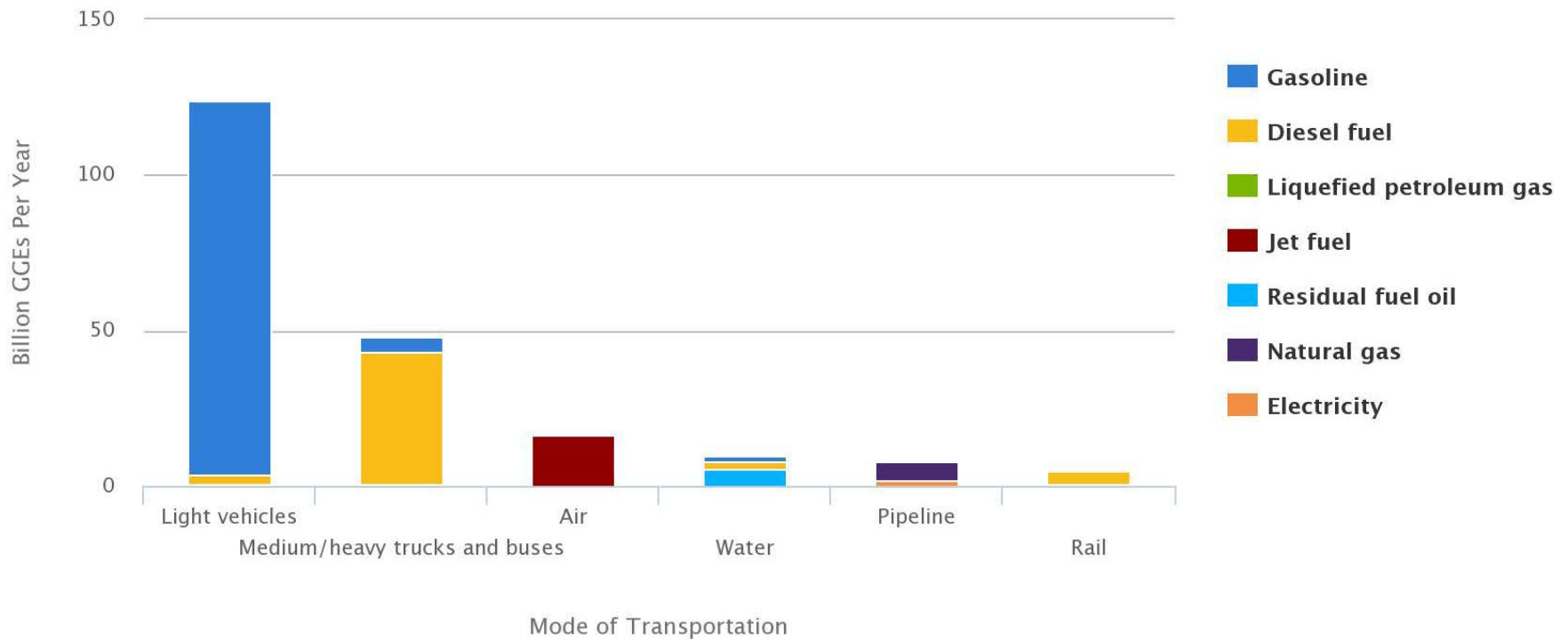


Mobile Source Clean Air Rules

- ❑ **Clean Cars and Passenger Trucks –Tier 3**
- ❑ **Clean Heavy-Duty Trucks and Buses**
- ❑ **Mobile Source Air Toxics Rule**
- ❑ **Clean Non-road Diesel Engines and Equipment**
- ❑ **Locomotive and Marine Diesel Standards**
- ❑ **Ocean-going Vessels**
- ❑ **Small Gasoline and Recreational Marine Standards**
- ❑ **Ultra-low Sulfur Fuel Requirements**
- ❑ **Renewable Fuel Standards**

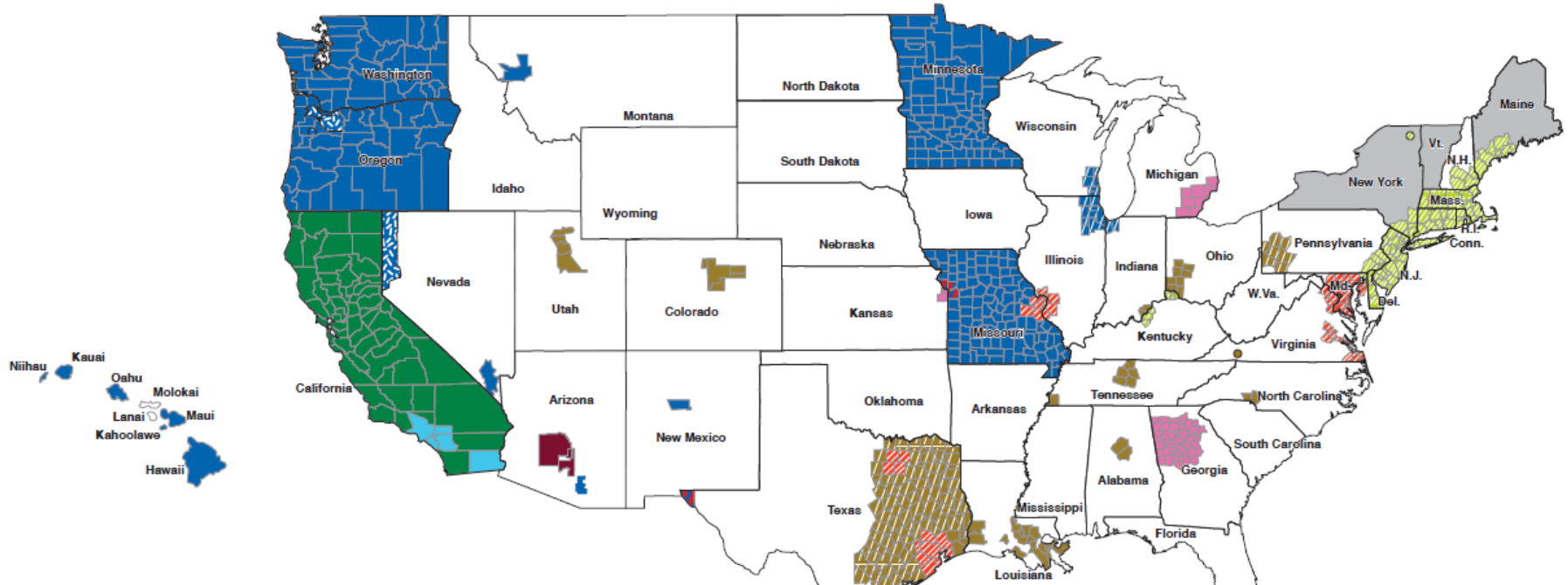


Transportation Energy Use by Mode and Fuel Type





U.S. Gasoline Requirements



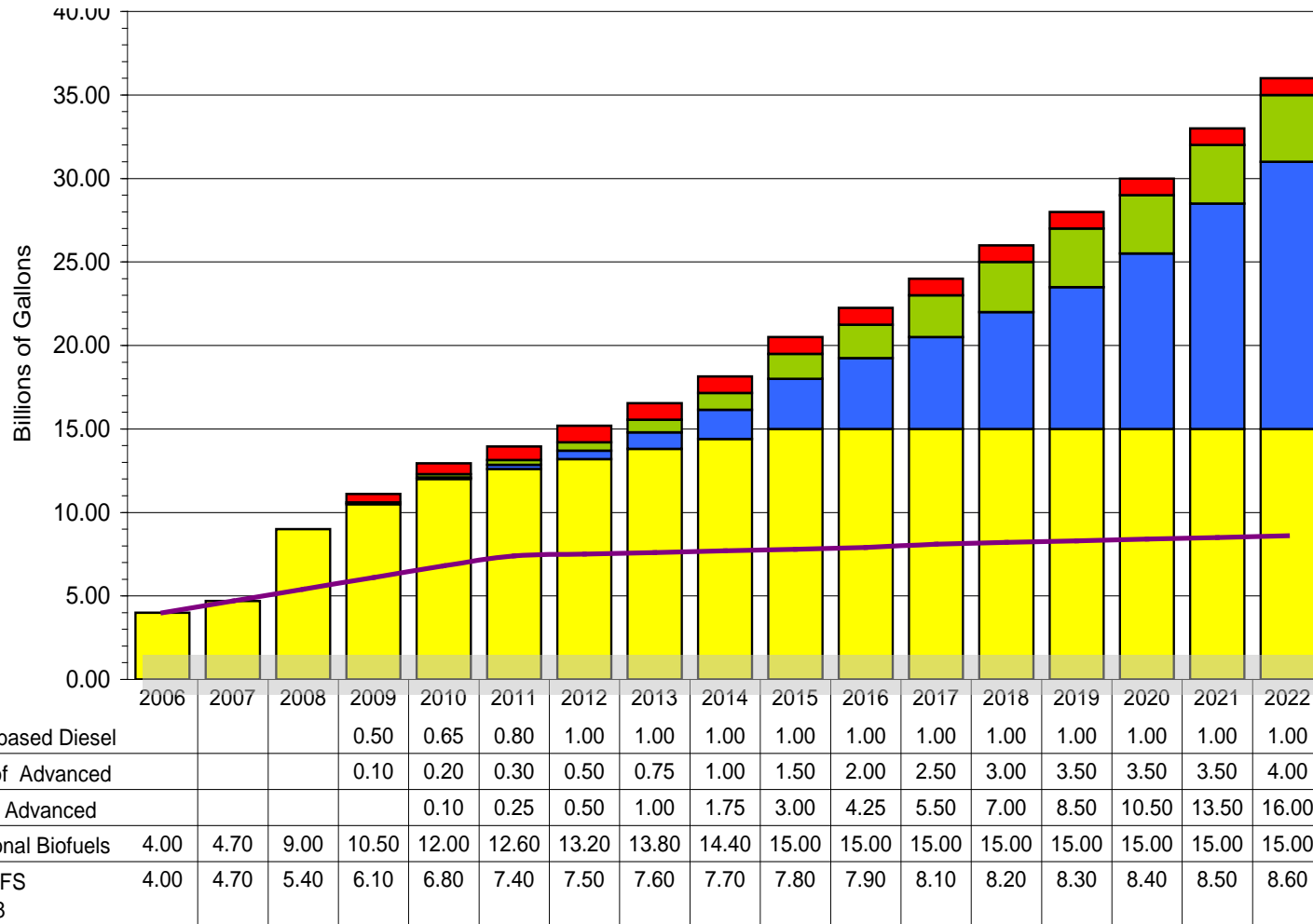
- | | |
|--------------------------|--|
| Oxygenated Fuels | CHI/MIL RFG w/Ethanol |
| CA RFG | N RFG w/Ethanol |
| CA OXY RFG | S RFG w/Ethanol |
| AZ CBG | 7.0 Summer RVP |
| Oxy Fuels/7.8 Summer RVP | 7.8 Summer RVP |
| Oxy Fuels/7.0 Summer RVP | 7.8 Summer RVP No 1 psi EtOH Allowance |
| Conventional | Conv, No 1 psi EtOH Allowance |

ExxonMobil
As of June, 2015

This map is not intended to provide legal advice or to be used as guidance for state and/or federal fuel requirements, including but not limited to oxy fuel or RFG compliance requirements. ExxonMobil makes no representations or warranties, express or otherwise, as to the accuracy or completeness of this map.

K.W. Gardner
IN# 52715

Renewable Fuel Standard (RFS), 2007-2022



Source: DOE/NREL





Summary

- ❑ **The Clean Air Act has been successful in dramatically reducing air pollution in the United States.**
- ❑ **Reduction in pollution from all types of motor vehicles has been critical to meeting air quality goals.**
- ❑ **Regulation of motor vehicle fuels at the national level, combined with local fuel requirements has brought many areas to within health-based air quality standards.**
- ❑ **Use of oxygenates in fuels, primarily ethanol, has been an important component of fuels programs in the U.S.**
- ❑ **Ethanol will play a very strong role in national fuels programs in the future.**