

Historical Trends and Petroleum Reduction Technologies Performance

California Energy Commission

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Goals, Missions & Objectives

Energy Commission

- Alternative Fuels Use
- 2020 Petroleum Reduction



Performance Data Sources Used

Vehicle Population - DMV 27.9 million vehicles, 25 classes
– 17 Model Years

Fuel Consumption:

- BoE- Gasoline, Diesel, Propane, Biodiesel
- ARB, CEC A-15 - E85
- Energy Commission PIIRA, BoE- Biodiesel
- Utilities / LNG & Biogas Providers /EIA - Natural Gas

Fuel Economy -U.S. EPA-City/Highway Combined Cycle

Vehicle Miles Traveled - Cal Trans & BAR-Smog Check Program



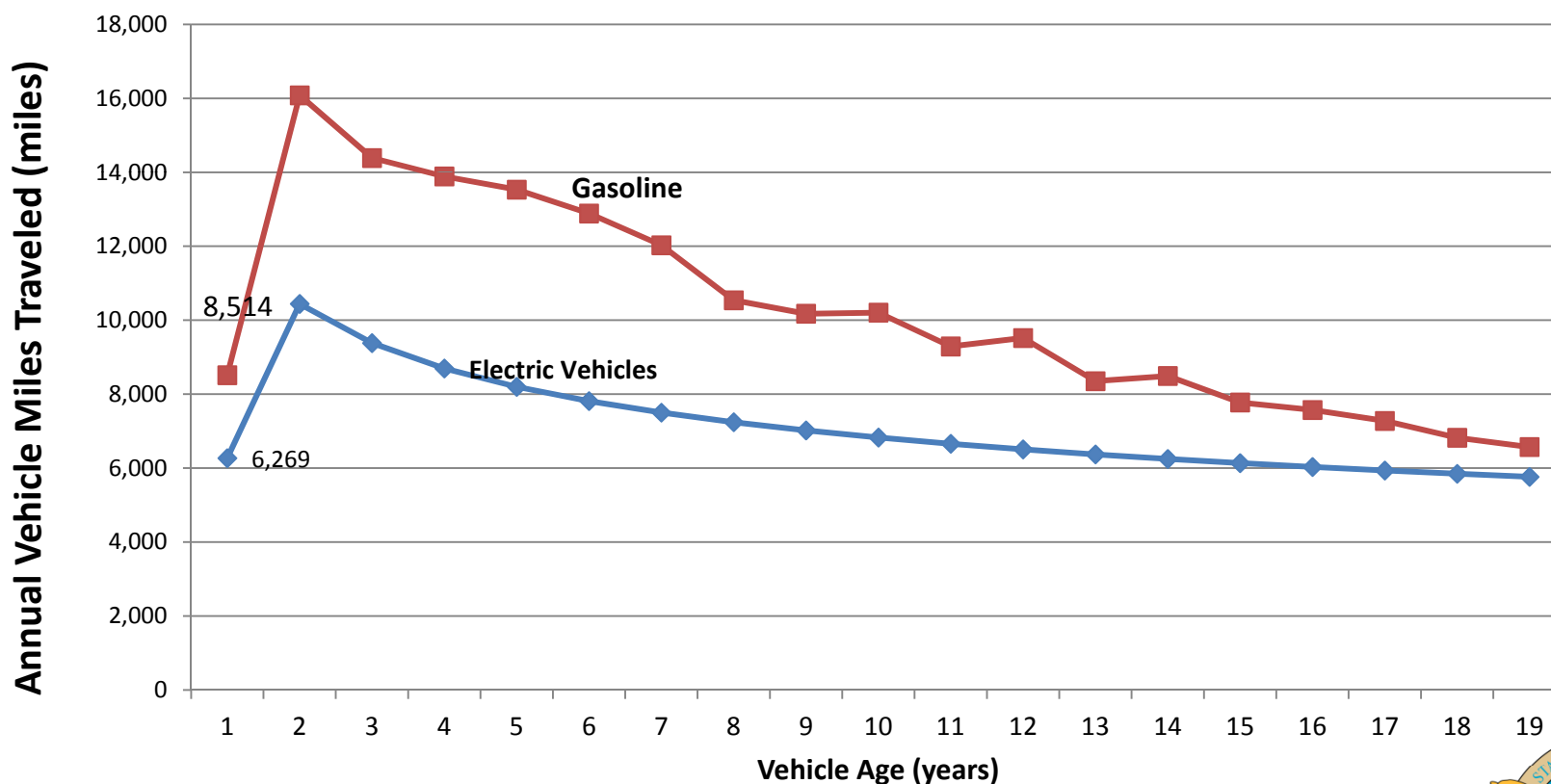
Analysis Simplified

$$\sum \left[\frac{\text{Vehicle Population} \times \text{Miles Traveled}}{\text{Fuel Economy MPG}} \right] = \text{Fuel Demand \& GHG}$$



Analysis Continued

Vehicle Miles Traveled



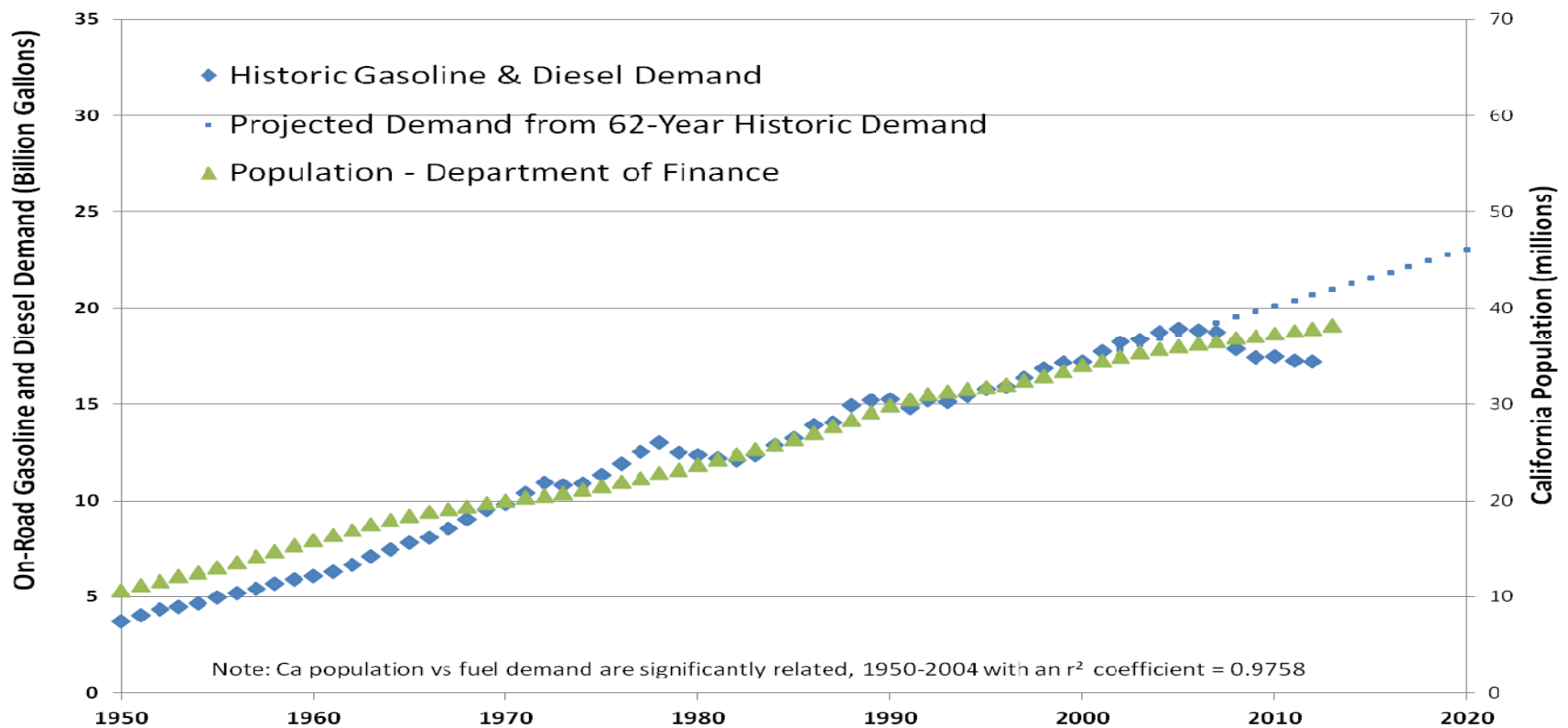
Source: BAR, 2009 I&M Program, gasoline vehicle mileages representing apx. 4.7 million vehicles
FERC Historic Data, 77 electric vehicles, assuming 0.33 KWh/mile per vehicle.



Results



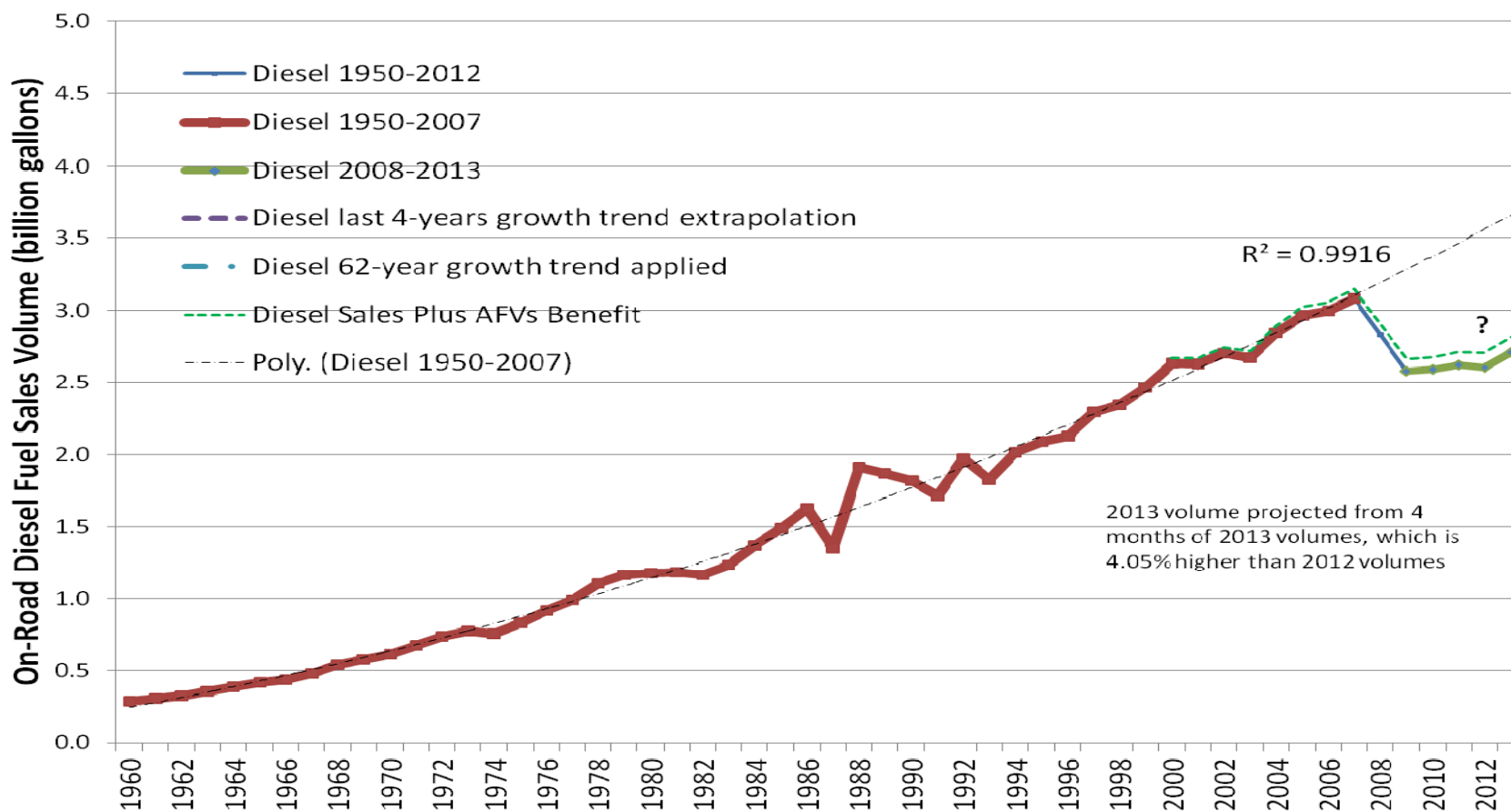
62-year View Fuel Demand and Population



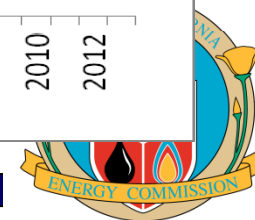
Source: Commission Analysis of the Board of Equalization Taxable Fuel Sales and Department of Finance population forecast.



On-Road Diesel Sales Trend

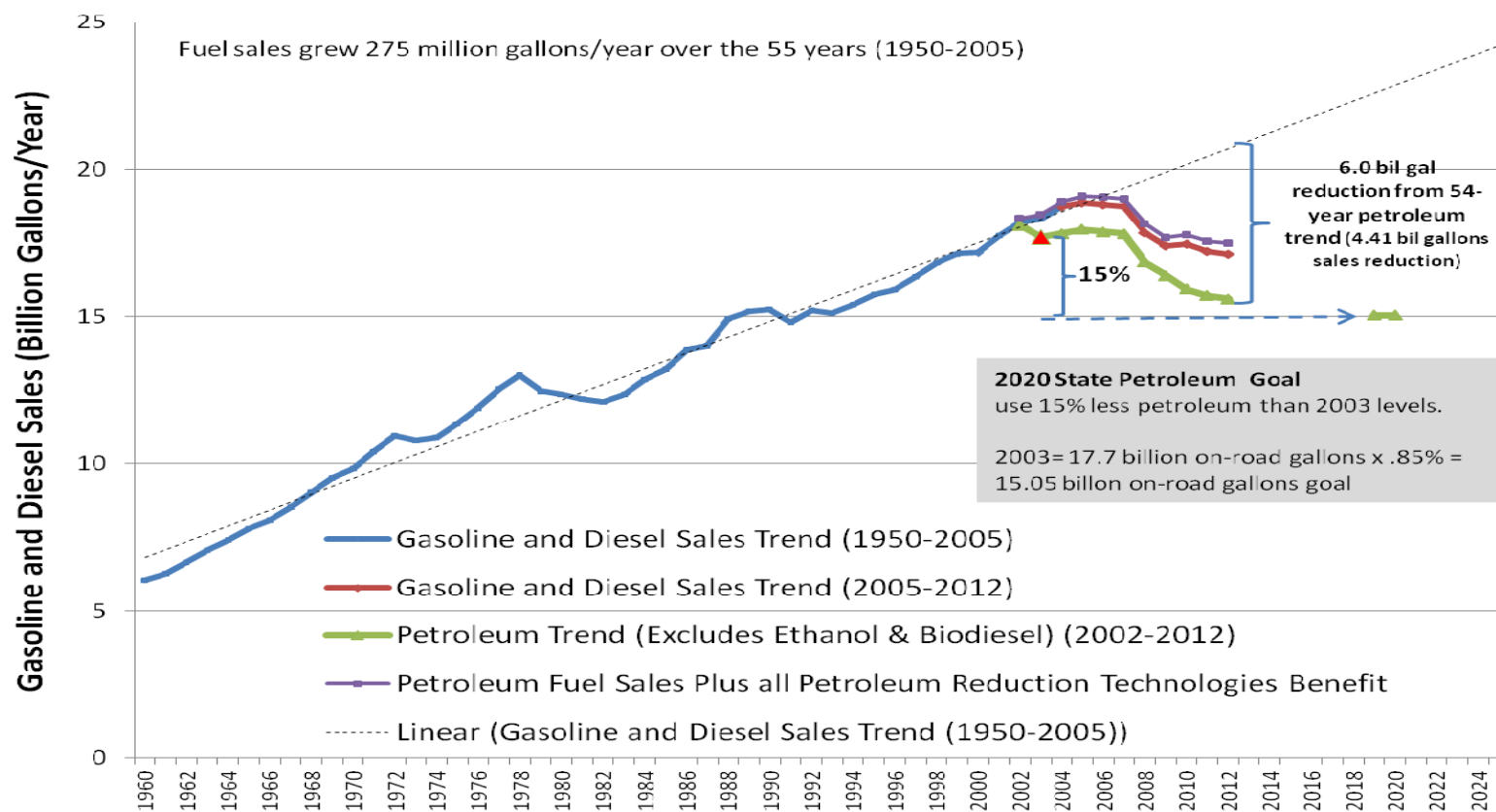


Source: Board of Equalization Taxable Diesel Fuel Sales, Commission Analysis -Alternative fuels



Petroleum Reduction Goal

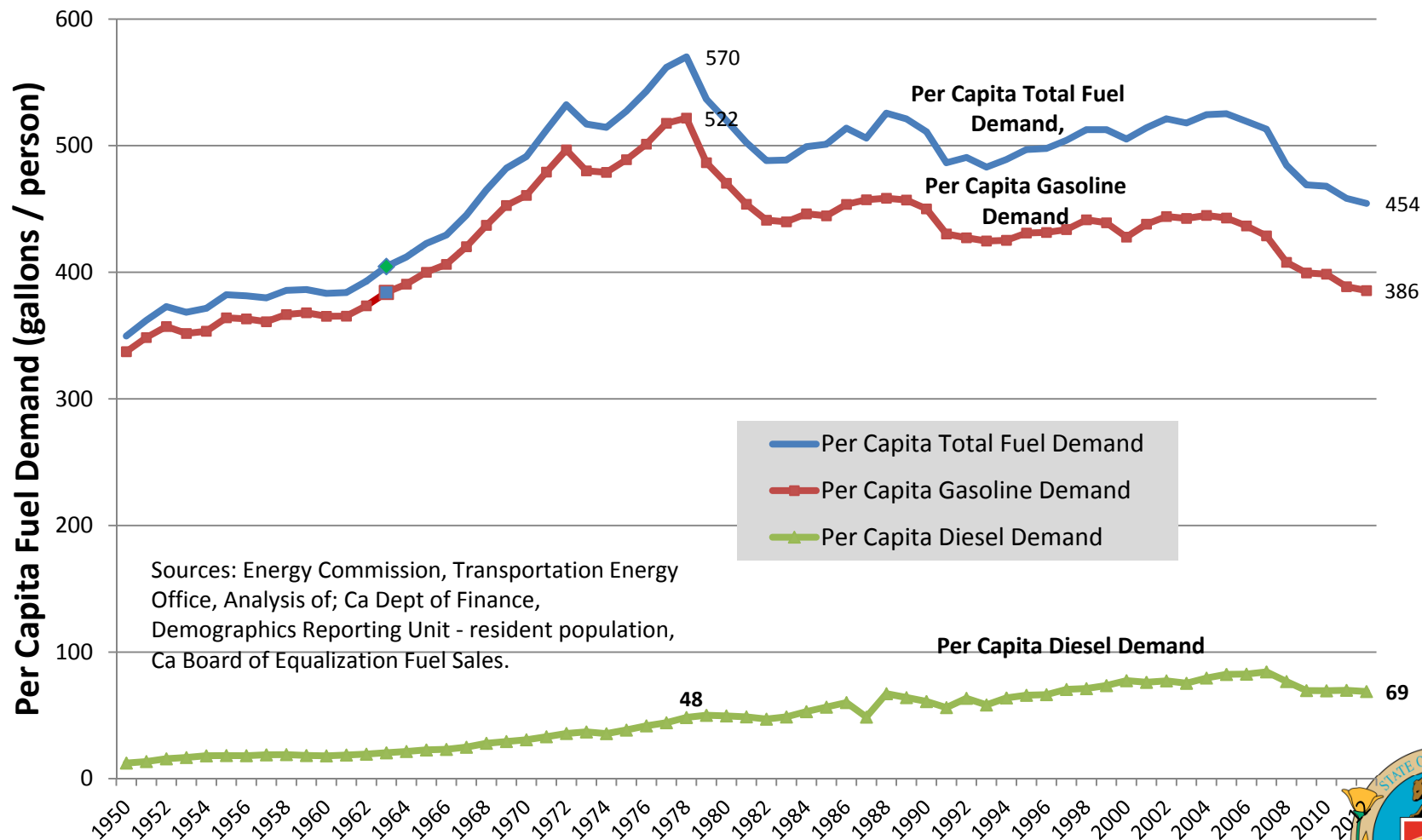
California's On-Road Fuel Demand Trend (1960-2020)



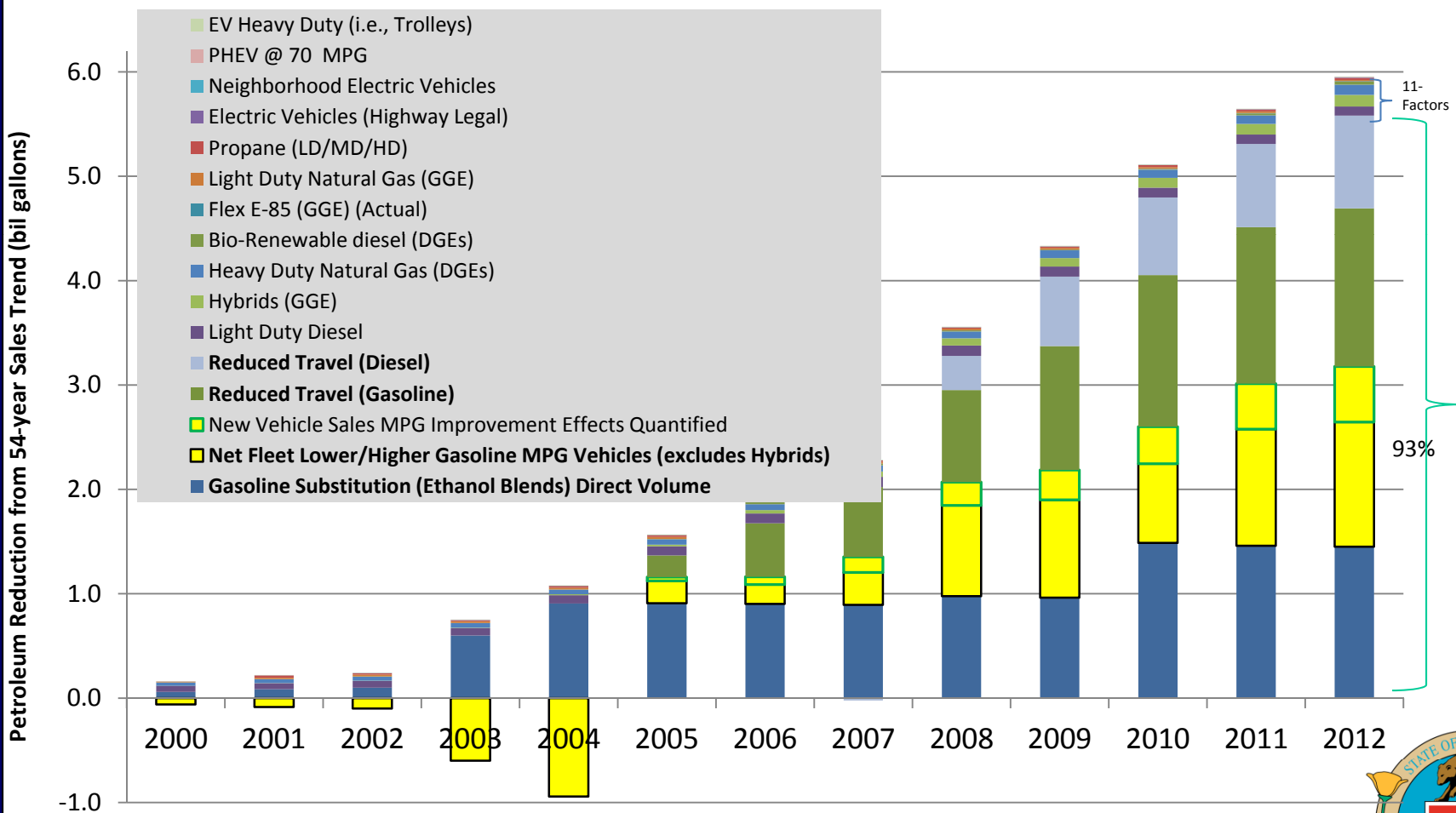
Source: California Energy Commission analysis of Alternative fuels and BoE Taxable Gasoline and Diesel Fuel Sales



Per Capita Fuel Demand Trend



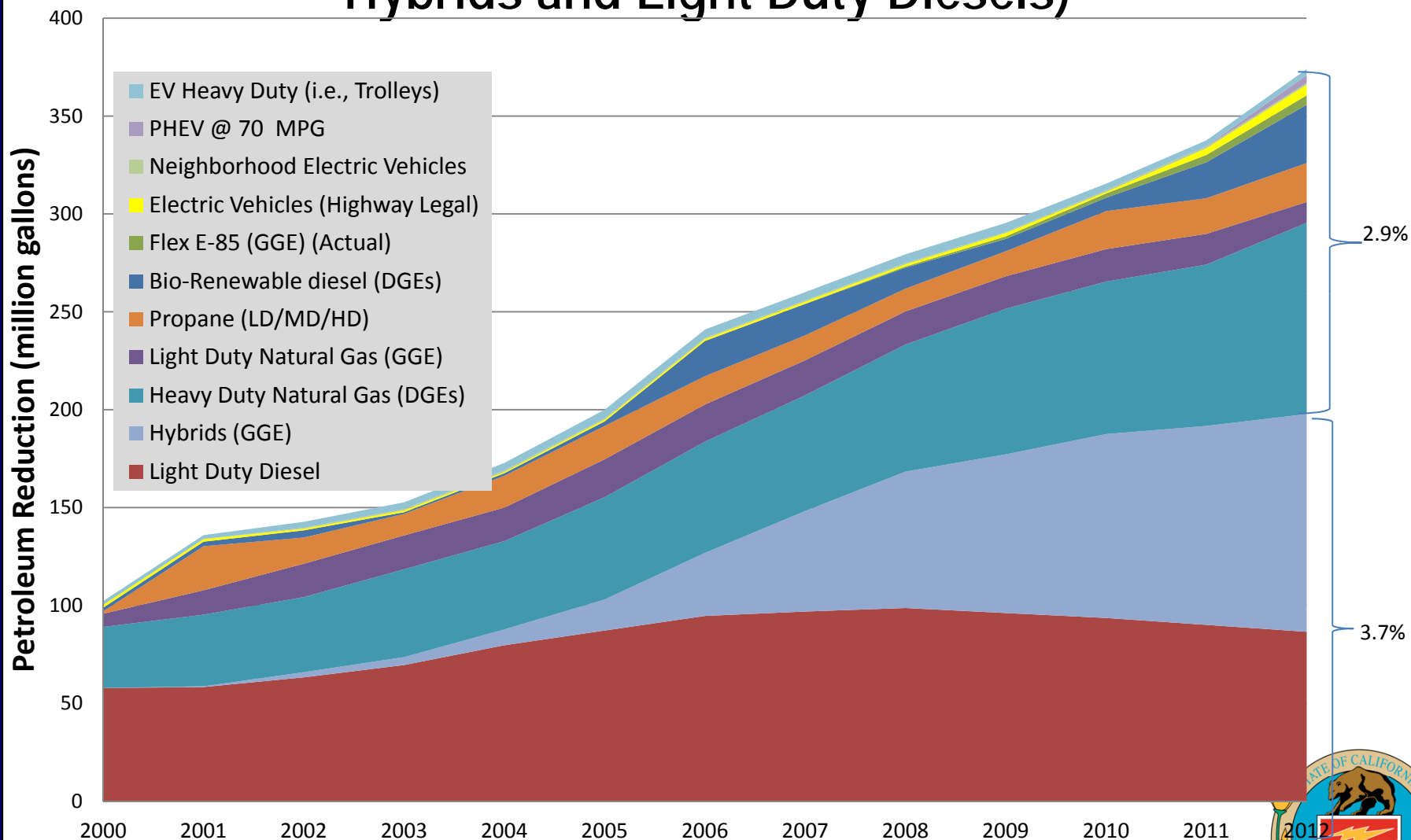
Individual Contributors to California's Historic Petroleum Reductions



Source: Energy Commission, Transportation Energy Office



Close-up Petroleum Reduction Trend (Alternative Fuels, Hybrids and Light Duty Diesels)

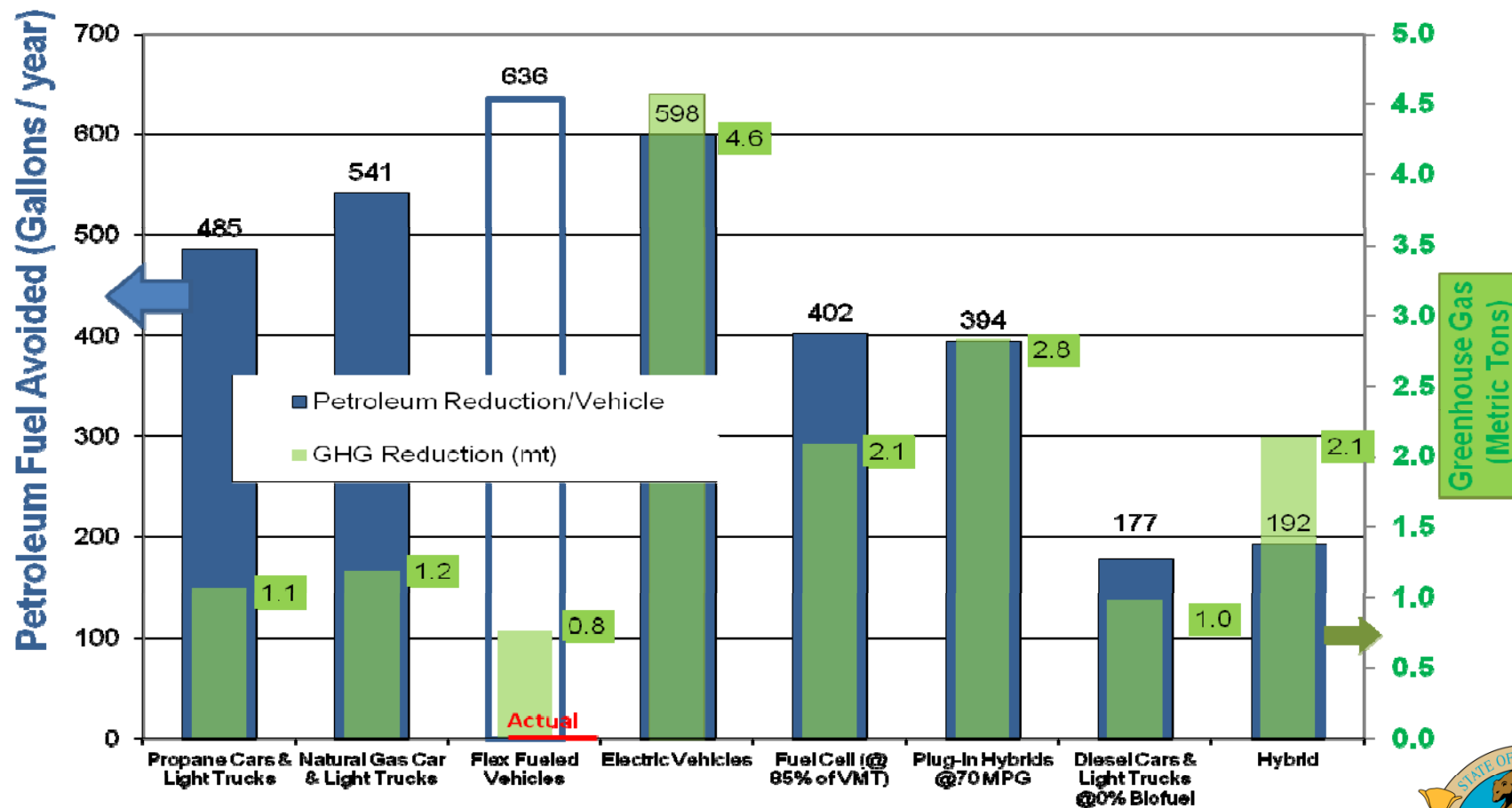


Source: Energy Commission, Transportation Energy Office



Petroleum & GHG Reduction Per Vehicle

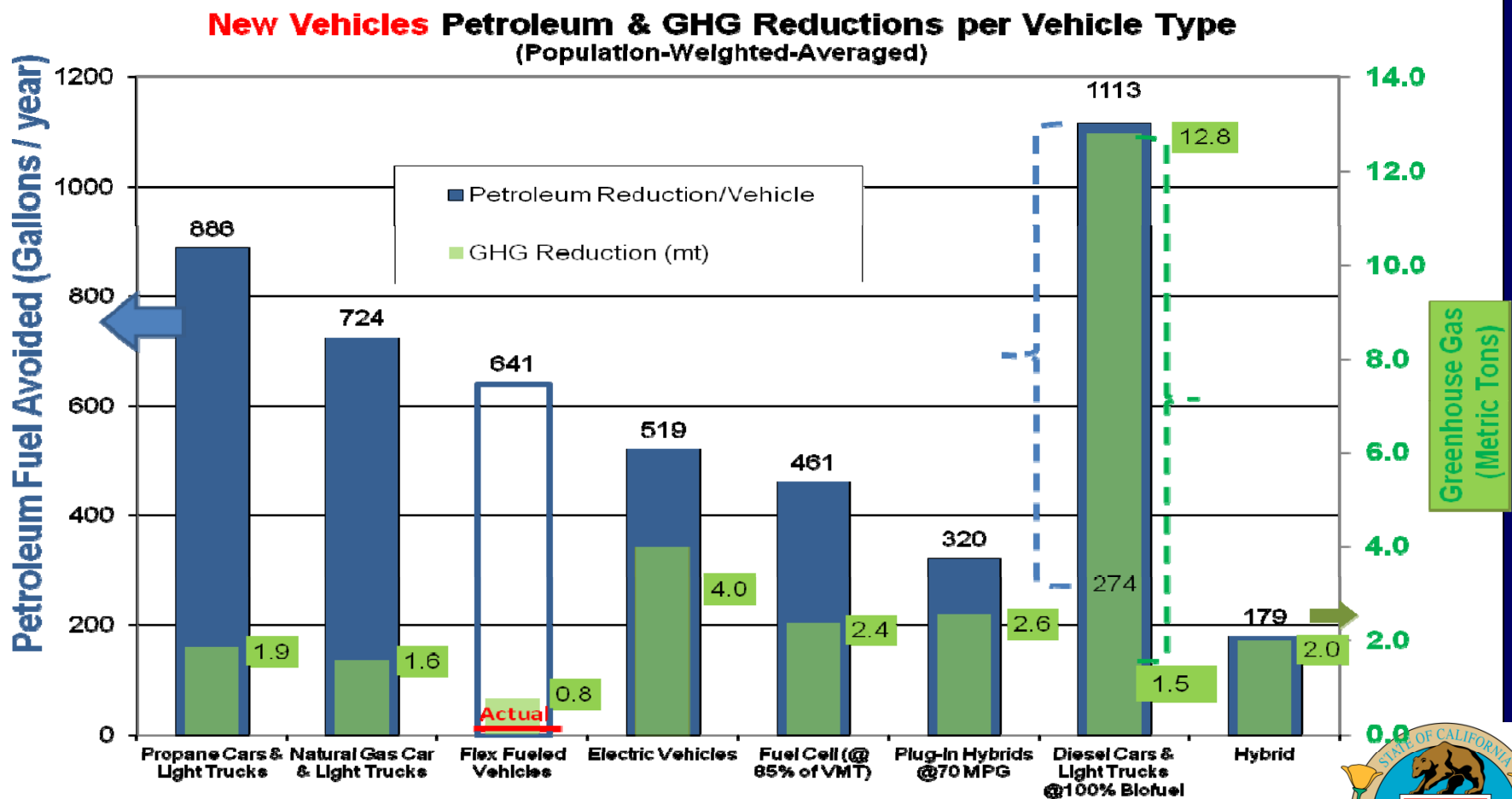
Vehicle Population Petroleum & GHG Reductions per Vehicle Type
(Population-Weighted-Averaged)



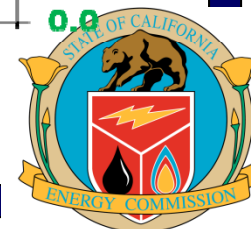
Source: Energy Commission, Transportation Energy Office



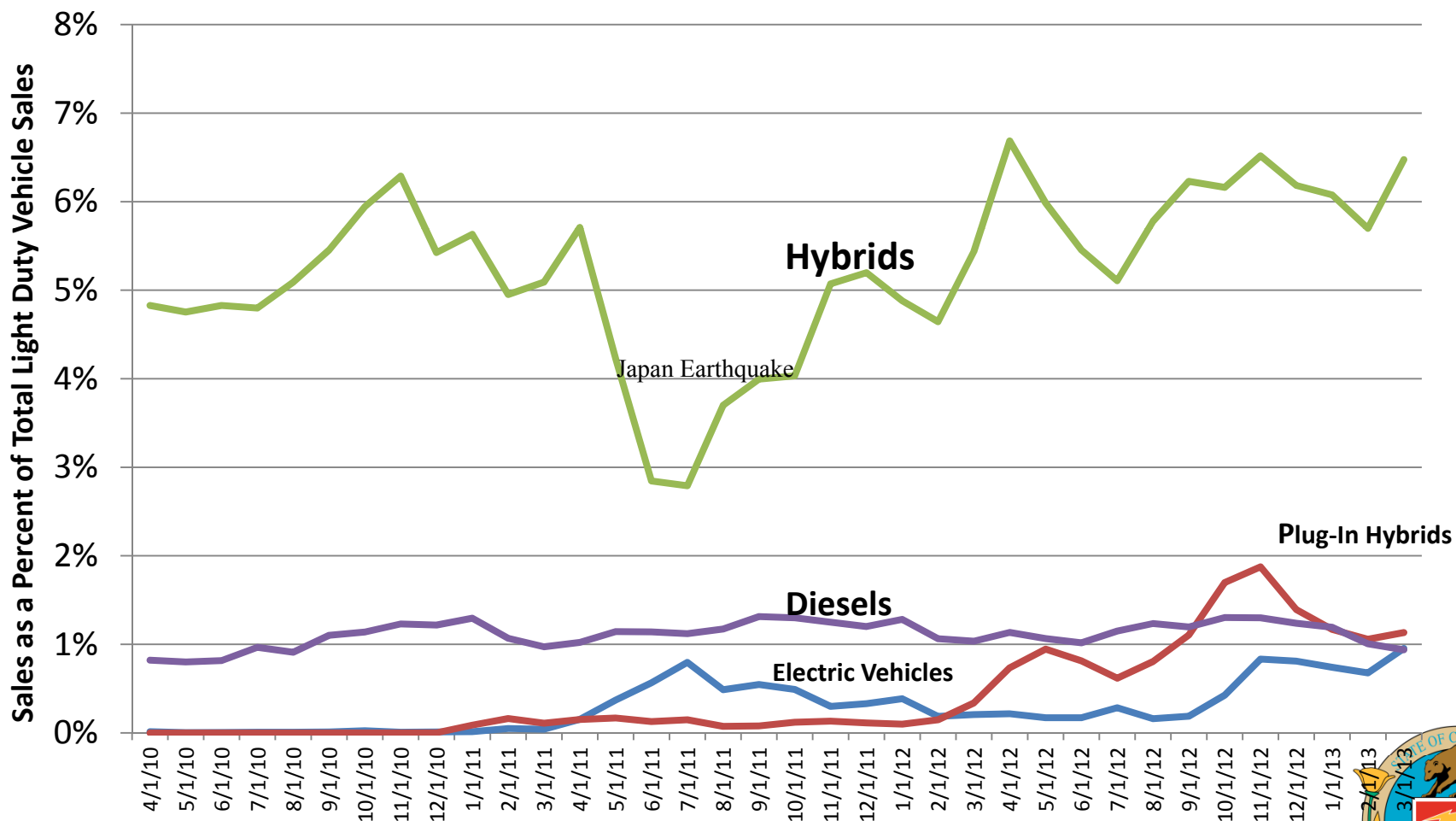
New Vehicles Petroleum and GHG Reduction & 100% Bio-Fuel Illustration - applies to All Fuel Types (except FFVs)



Source: Energy Commission, Transportation Energy Office, GHG Analysis applies 2007 WTW values.



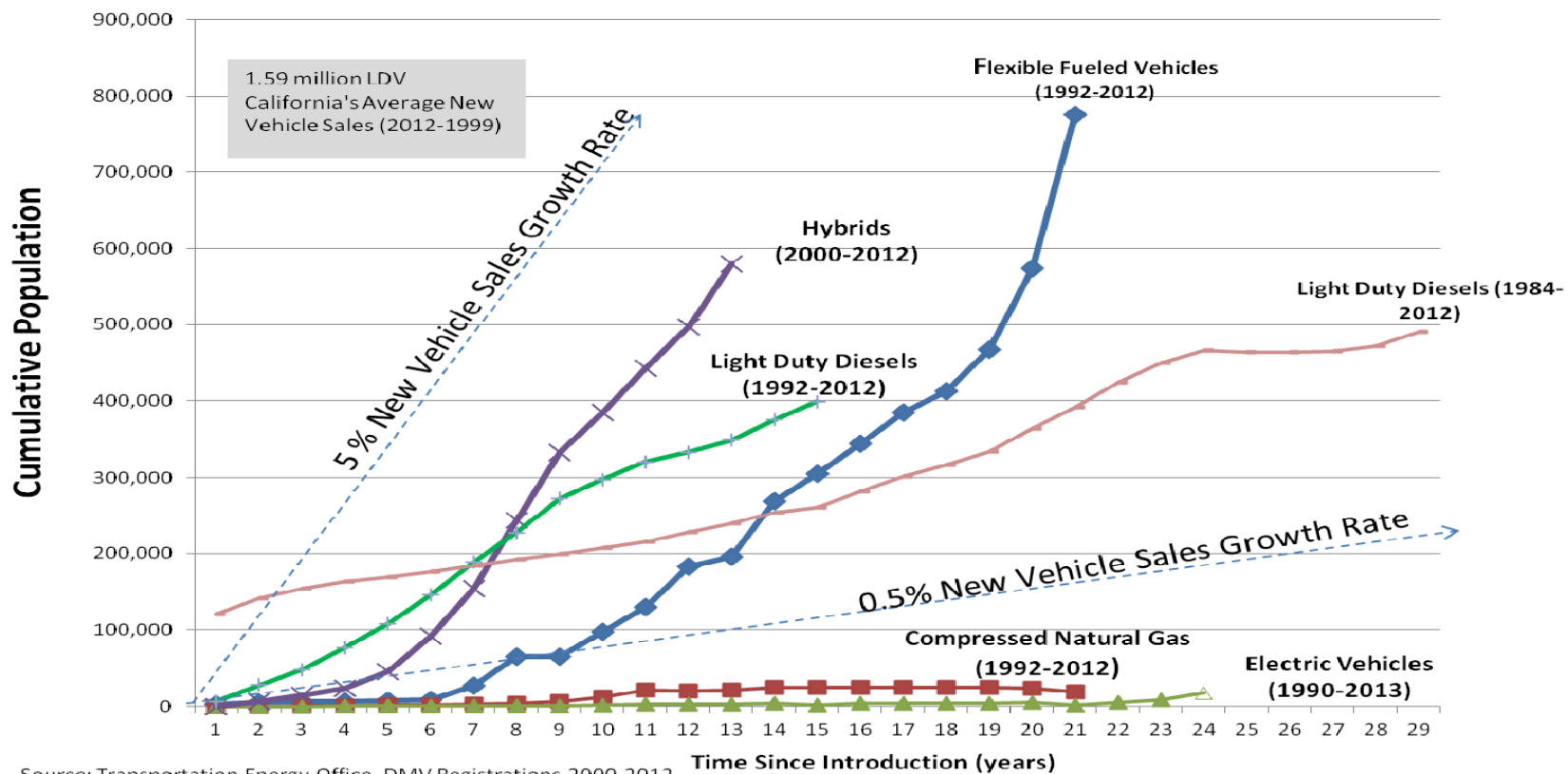
California New Vehicle Sales of some Light Duty Petroleum Reduction Technologies



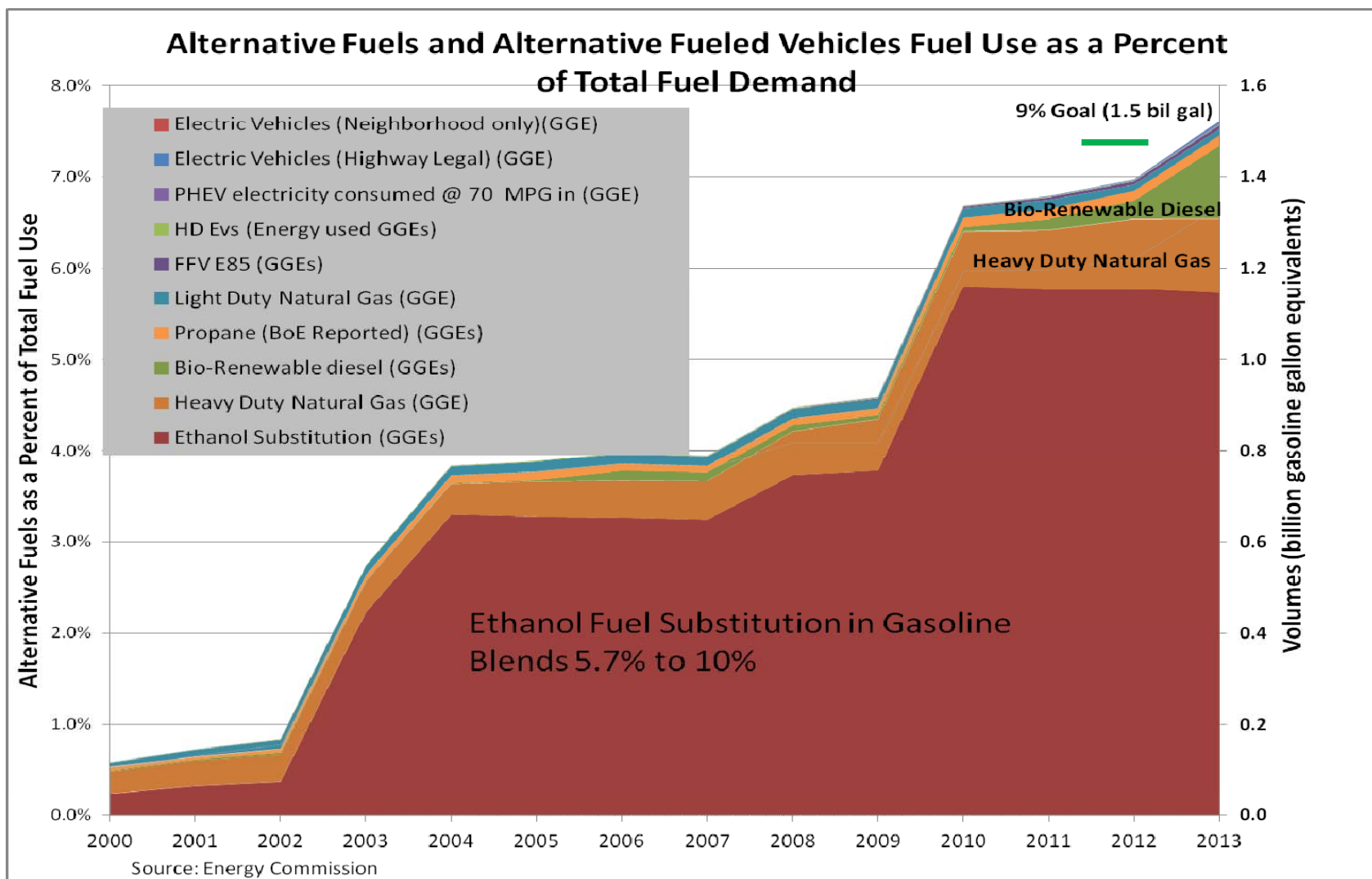
Source: Department of Motor Vehicle, Vehicle Registrations, Energy Commission



California's Vehicle Trend



State Alternative Fuels Use Goal



Conclusion

6 billion gallon reduction in transportation fuel use from the historic growth trend.

1. Reduced Miles Traveled (43.6%)
2. Consumer shift to higher fuel economy vehicles (31%)
3. Ethanol (fuel substitution) (18%)
4. Dedicated alternative fuels & dedicated AFVs (2.9%)



Questions and Answers

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