

Fueling Uncertainty: Assessing California's Petroleum Supply Resilience and Strategic Planning:

Fuel Standards and Air Pollution

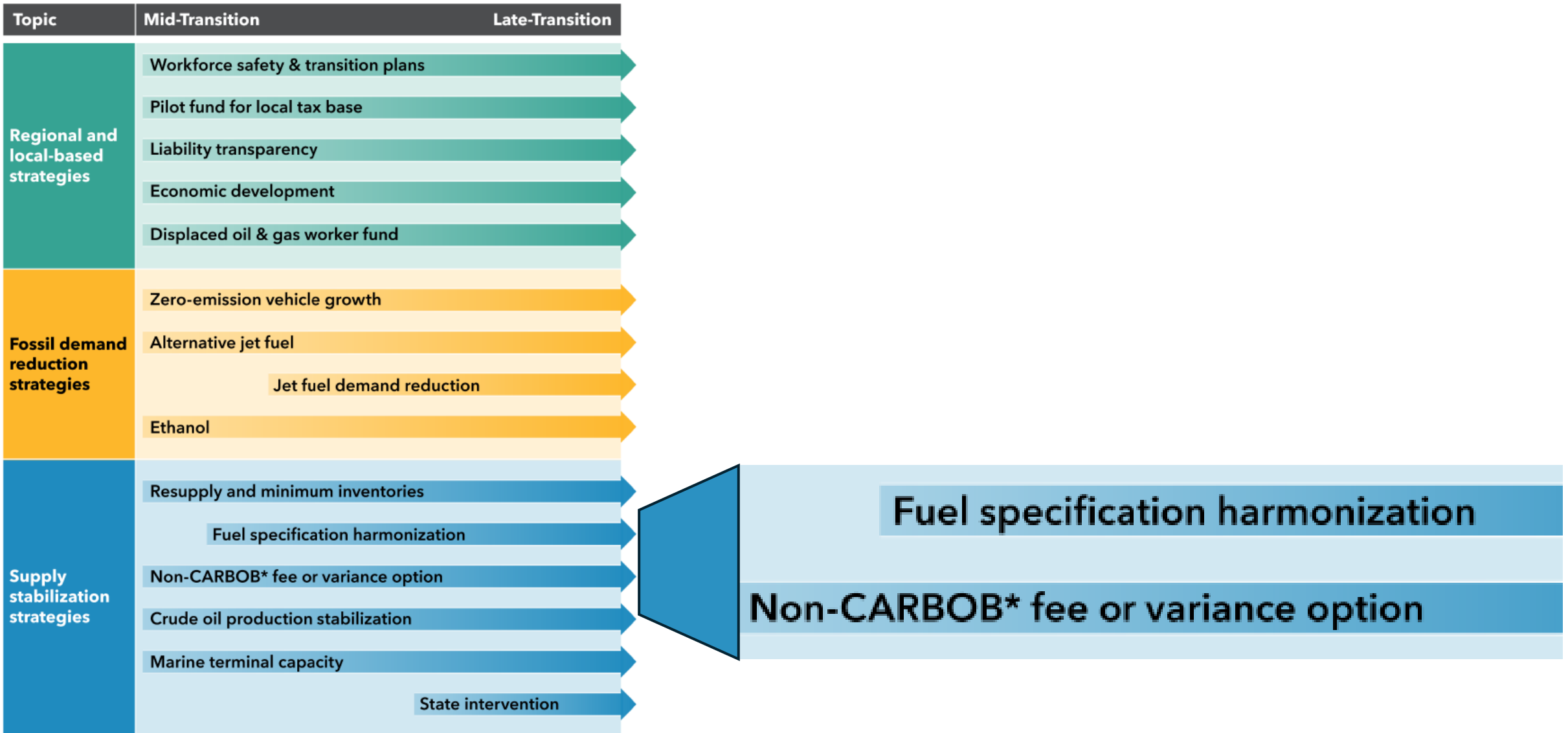
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Union of Concerned Scientists

Transportation Fuels Transition Plan Strategies



* California Reformulated Gasoline Blendstock for Oxygenate Blending

2005

GAO

United States Government Accountability Office
Report to Congressional Requesters

June 2005

GASOLINE MARKETS

Special Gasoline Blends Reduce Emissions and Improve Air Quality, but Complicate Supply and Contribute to Higher Prices



GAO-05-421

<https://www.gao.gov/assets/gao-05-421.pdf>

2026

WORKING PAPER

Fuel flexibility + cleaner cars

Mitigating air pollution from fuel changes with a vehicle replacement program

Abstract

The EPA MOVES model was used to analyze the tailpipe pollution implications of allowing the use in California of gasoline that meets federal specifications for conventional gasoline (CG) or reformulated gasoline (RFG) in place of California Phase 3 Reformulated Gasoline (CaRFG3), subject to a fee used to fund a vehicle replacement program modeled on Clean Cars 4 All, which would help low income consumers replace pre-2004 passenger vehicles with electric vehicles. A voluntary program would allow the sale of CG or RFG in place of CaRFG3 subject to a 25 cent per gallon mitigation fee. We find that the pollution reduction benefits of the vehicle replacement program were larger than the pollution increases from the fuel changes because the difference between Ca-RFG3 and CG or RFG have narrowed over time, and modern vehicles are not very sensitive to small changes in fuel properties. Accelerating the replacement of older vehicles has pollution reduction and public health benefits that are concentrated in the areas where older vehicles are driven and also reduces the economic burden of gasoline price spikes on low income households that are more likely to drive older cars. Thus, the program would help address significant disparities in air pollution and economic burdens.

Jeremy Maritn

Georgia Klein

March 2026

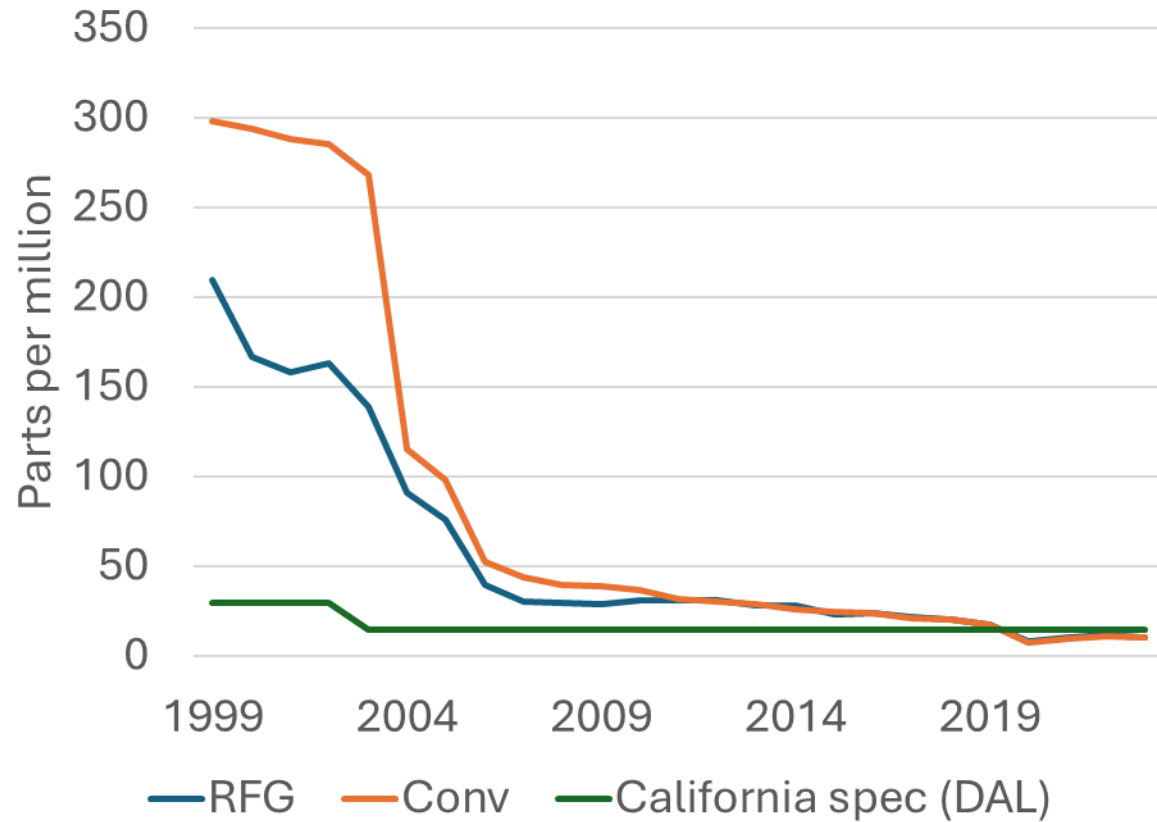
<https://files.ucs.org/2026/fuel-flexibility-mitigation.pdf>

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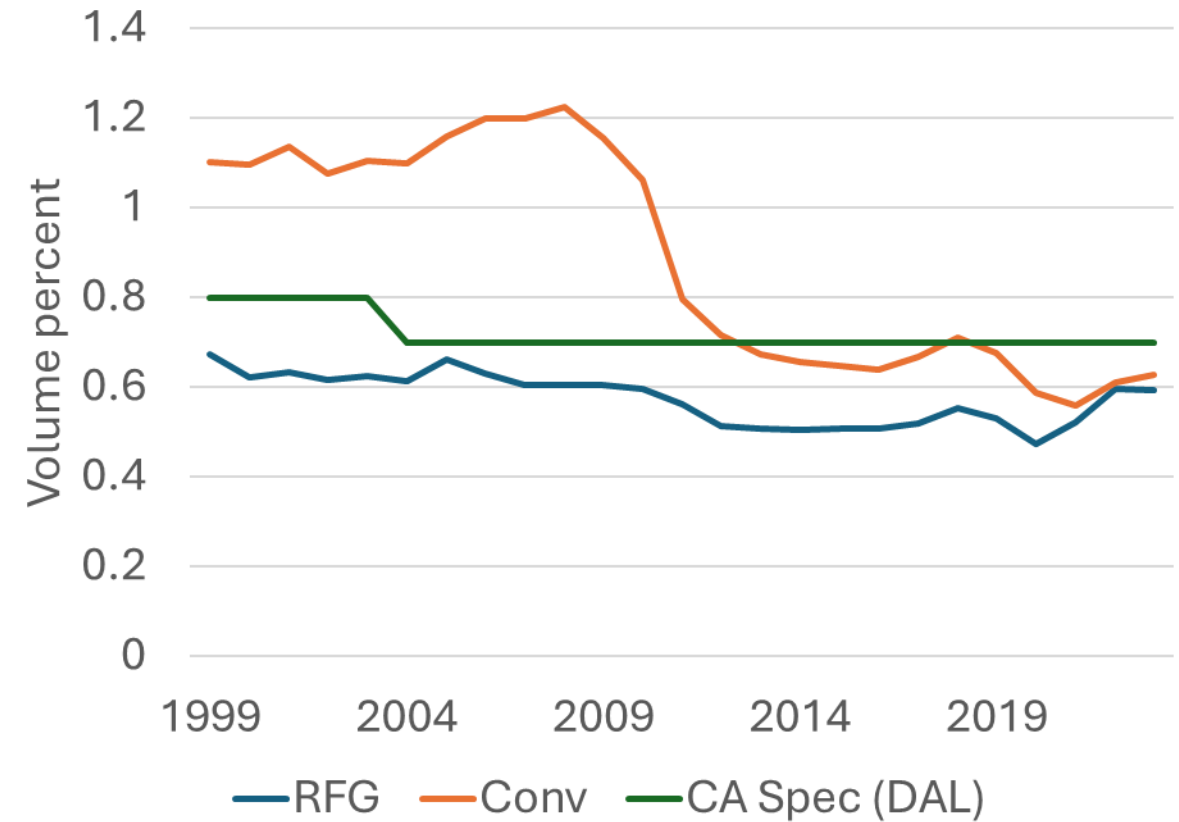
<https://files.ucs.org/2026/fuel-flexibility-mitigation.pdf>

California's special gasoline is less special than it used to be

US gasoline sulfur levels



US gasoline benzene levels

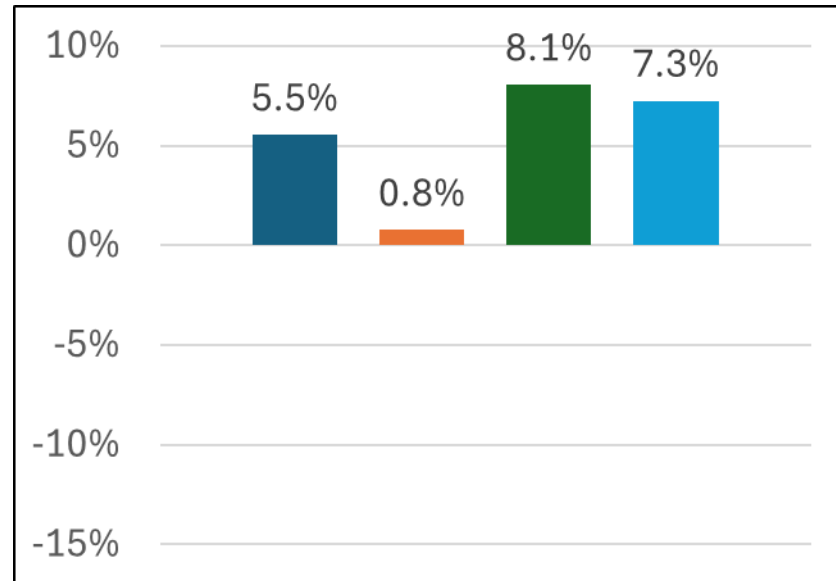


RFG = US Reformulated gasoline
Conv = US Conventional gasoline
DAL = daily averaging limit

Data sources: EPA Public Data on Gasoline Fuel Quality Properties and CARB CA-RFG3 regulations

Results

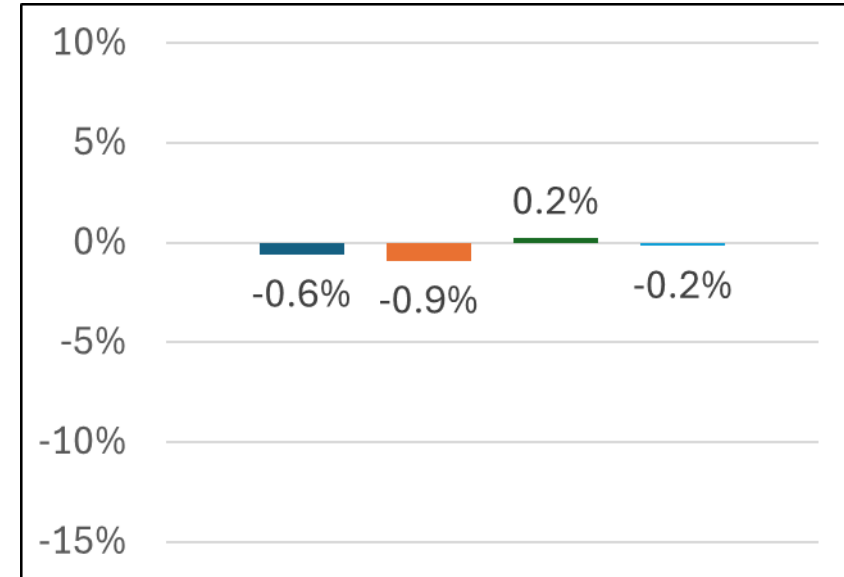
- Replace 100% of CARBOB with US-Avg gasoline
- No change in fleet



NOx

VOCs

- Replace 10% of CARBOB with US-Avg
- Replace 50k pre-2004 vehicles with 90% EVs

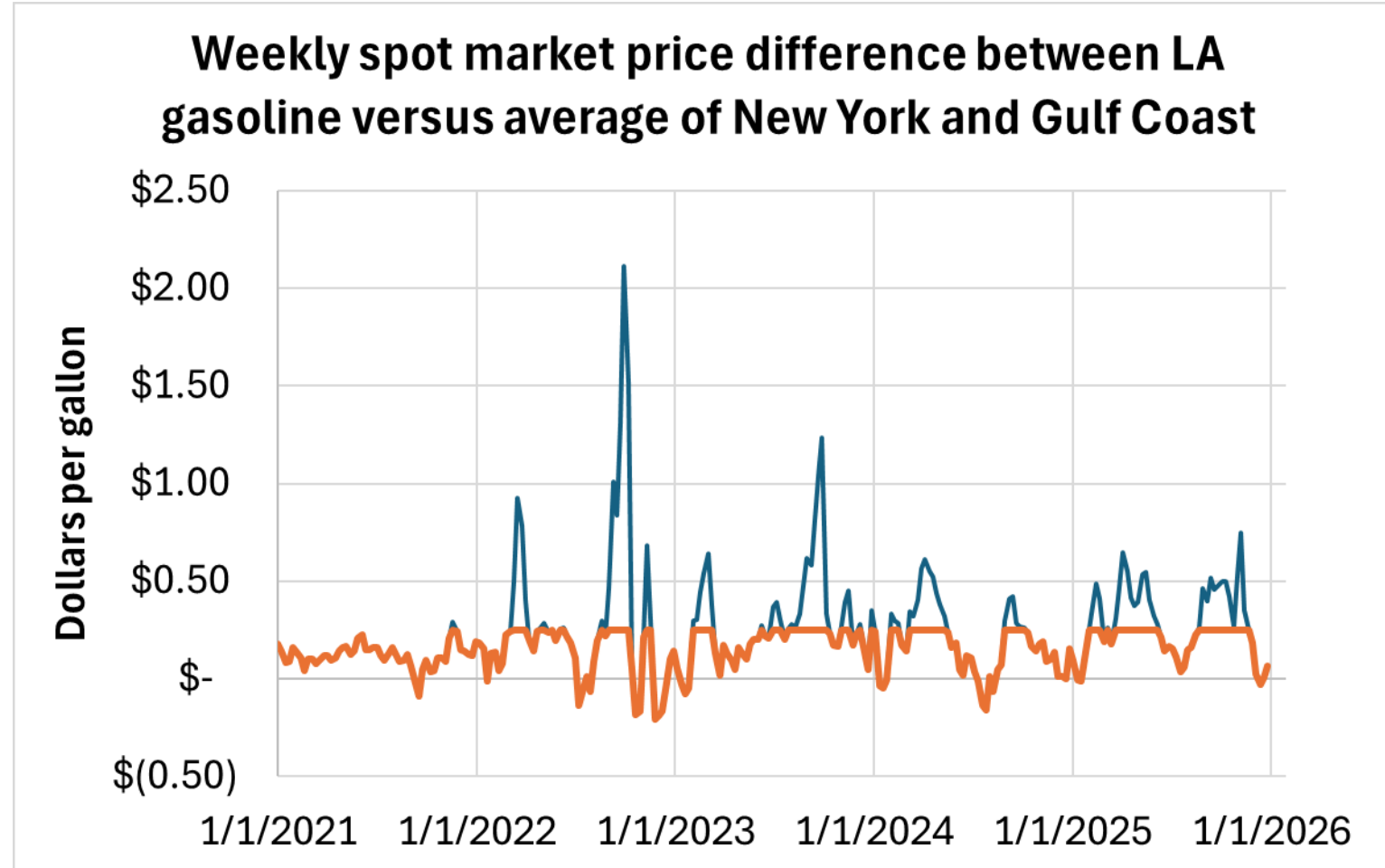


Primary PM2.5

Toxics

Fuel market impacts

- Median difference in spot market is 18 cents per gallon between 2021 and 2026
 - Spot market is the wholesale price, before taxes and fees
- Difference greater than 25 cents per gallon on 36% of weeks
- If price difference had been capped at 25 cents per gallon, savings over 5 years would have been \$5.4B



Recommendations

- Adapt fuel infrastructure to meet current and future needs
 - California is a mixed market supplied by a mix of in-state refineries, domestic and international imports. By 2030, pipelines will bring additional flexibility
- Focus on competition in fuel markets
 - From refiners, to terminals to racks to retail
- Modernize gasoline regulations
 - Short term flexibility to use non-CARBOB gasoline with mitigation by retiring older cars
 - By 2030 modernize California gasoline regulations to improve flexibility, reduce cost and protect air quality