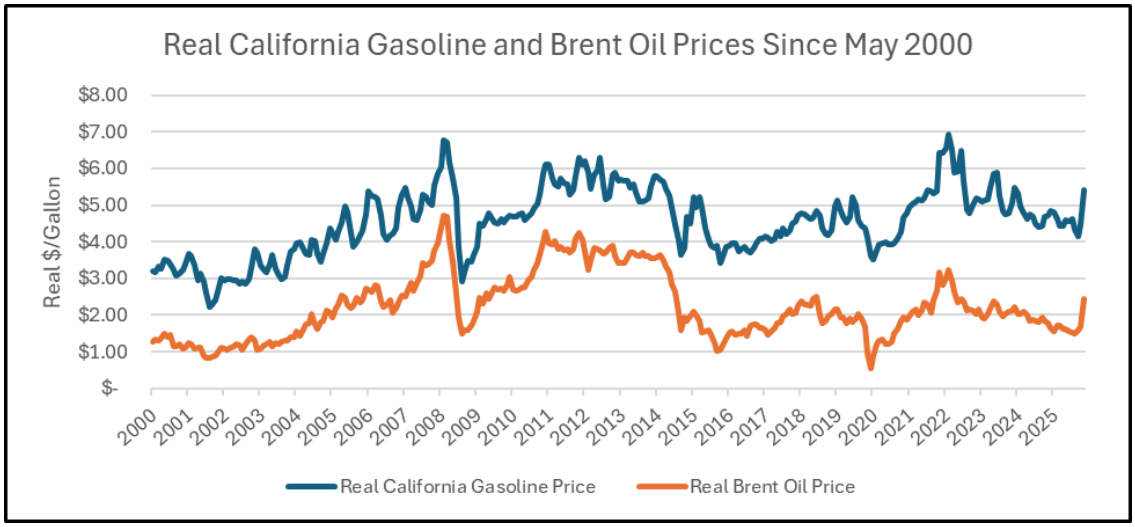
McCULLOUGH RESEARCH

ROBERT F. MCCULLOUGH, JR.
PRINCIPAL

What Really Drives California Gas Prices: Global Oil and Refinery Profits, Not Climate Policy

Robert McCullough
Joshua Crawford
William Clouse
April 6, 2026

California gasoline price spikes in 2008, 2012, and 2022 were all closely related to speculation (2008), a refinery outage (2012), and the start of the war in Ukraine (2022). The war in Iran is having a very similar impact on prices for West Coast consumers:



[1]

Each of these crises has been an opportunity for interested parties to introduce their own interpretation of events. Some present a sober discussion of the facts. Others could most politely be described as fanciful. The war with Iran is no exception.

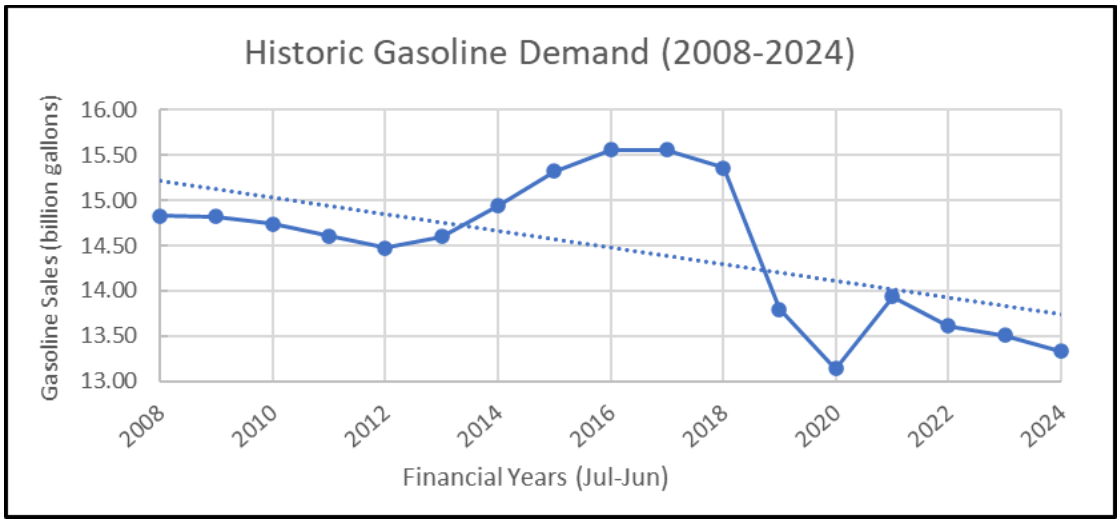
[1] U.S. Energy Information Administration, California All Grades All Formulations Retail Gasoline Prices, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPM0_PTE_SCA_DPG&f=M
U.S. Energy Information Administration, Europe Brent Spot Price FOB, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RBRTE&f=M

This year, we have seen assertions that the rapid rises in California, Oregon, and Washington gasoline prices are due to environmental programs like Cap and Trade and the Low Carbon Fuel Standard. Recent interviews have argued that the increasing price of gasoline from Asia would require Chevron to reduce U.S. based refining capacity. Both arguments have little merit.

Overview of the West Coast Gasoline Market

As has frequently been observed, the West Coast gasoline market is an island. Unlike the rest of the United States, California, Oregon, and Washington function as a single isolated market. Daily prices are largely determined by an unusual market mechanism reported by the Oil Price Information Service. The market is thin – with a limited number of buyers and sellers – and frequent suspicions of the exercise of market power.[2]

The major players are refineries in northern Washington state and northern and southern California. Gasoline is moved by tanker and barge along the Pacific coast and also sold to Canada and Mexico. As fuel efficiency and the number of electric vehicles has expanded, gasoline sales have been reduced. In California, for example, gasoline sales from refineries have declined for years:



[3,4]

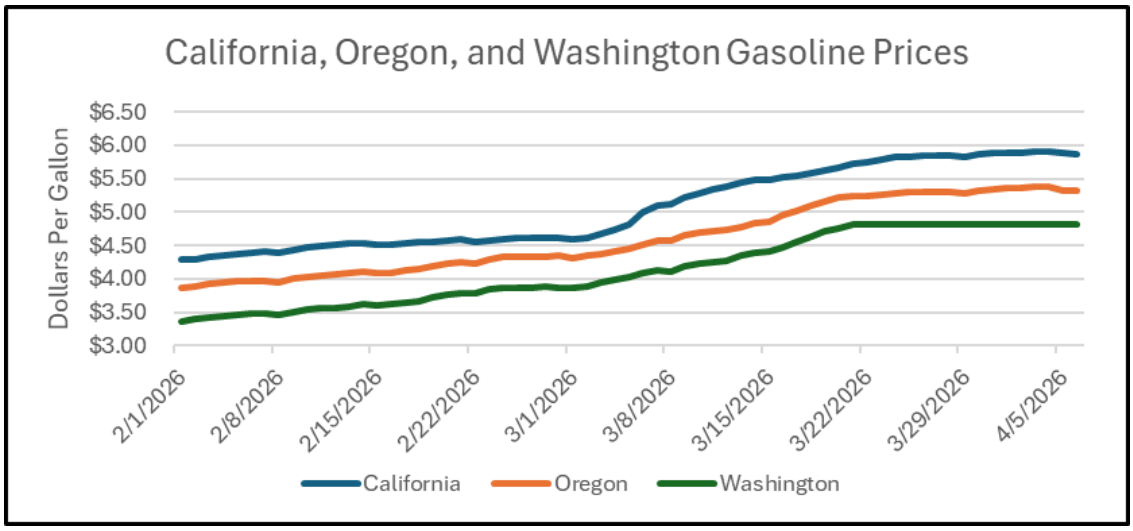
[2] OPIS bases its price reports on trades submitted by market participants. Not all trades are submitted and calculations are often dependent on just a handful of trades.
[3] California Department of Tax and Fee Administration, Gasoline Tax Data (Table 24A), https://cdtfa.ca.gov/dataportal/dataset.htm?url=FuelGasJetStats
[4] The dotted line is a simple regression of refinery sales against time.

Declining gasoline sales have closed some refineries and shifted others to different products. A recent monograph from the Stanford Climate & Energy Policy Program notes:

> The downward trend in refining activity reflects myriad factors, including most critically: (1) the depletion of California's crude oil fields and a corresponding decrease in the economic viability of in-state crude oil production, (2) declining in-state gasoline sales, (3) declining in-state fossil diesel consumption, (4) ongoing national and global consolidation of the oil industry, and (5) increased availability of imported finished fossil fuel products.[5]

This is hardly surprising. State and federal policy has supported measures to reduce use of fossil fuels, and the sources of oil shift to newer basins over time.

Given the limited number of market participants and the small number of refineries, it is also not surprising to find that gasoline prices are highly correlated among California, Oregon, and Washington:



[6]

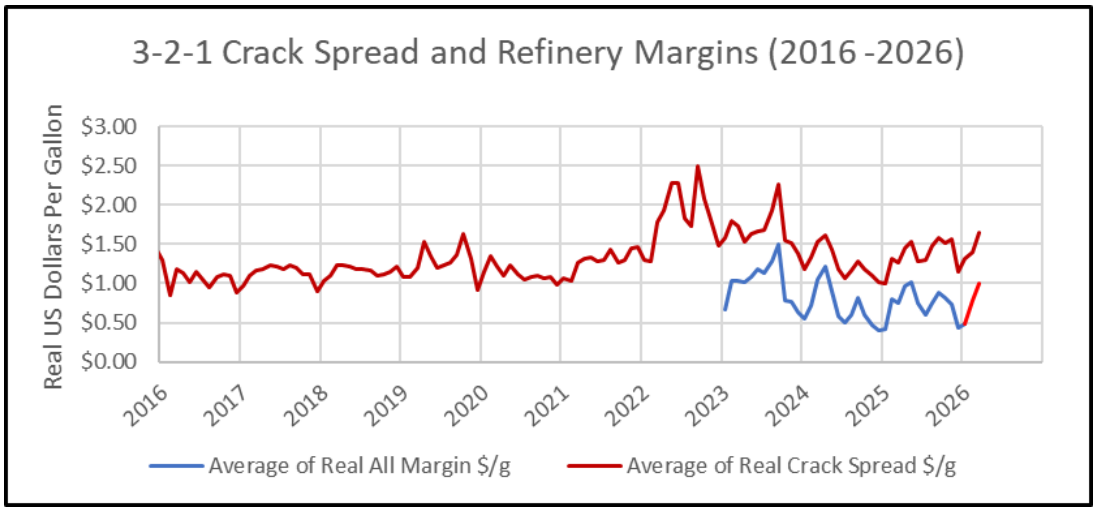
Since world oil prices are a primary factor in gasoline pricing, prices began to increase in all three states after February 28, 2026, when the U.S. and Isreal attacked Iran.

[5] The Writing on the Wall: Why California Refineries Are Closing, Thomas J.P. Hersbach, Constance Cho, Michael Mastrandrea, Michael Wara, and Deborah Sivas, February 11, 2026, page 1.
[6] GasBuddy Price Charts, https://www.gasbuddy.com/charts

Refinery Profit Margins

Four years ago, Governor Newsom signed Senate Bill 1322 which required that refineries in California post their margin of revenues over costs on a monthly basis. [7]

Sadly, the current data on Senate Bill 1322 margins are a bit short for useful econometrics, but a less precise, longer data series on Crack Spreads indicates the surprising conclusion that refinery profits increase when costs increase.[8]



9,10

Crack spreads "represent the price difference between products and crude oil [and] can be used to determine the relative value of various petroleum products for refineries to produce." [11] The Los Angeles 3-2-1 crack spread is a refinery margin proxy for the LA market, based on turning 3 barrels of crude oil into 2 barrels of LA gasoline and 1 barrel of LA distillate. The resulting gross margin is expressed in dollars per gallon.

---

[7] https://legiscan.com/CA/text/SB1322/id/2606948
[8] The required filings commenced in January 2023 – thirty-seven reports. The Senate Bill 1322 reports also commenced after the price spike associated with the Russian invasion of the Ukraine.
[9] California Energy Commission SB 1322 Tables, https://www.energy.ca.gov/media/9163
U.S. Energy Information Agency, Los Angeles Reformulated RBOB Regulated Gasoline Spot Price, https://www.eia.gov/dnav/pet/hist/EER_EPMRR_PF4_Y05LA_DPGD.htm
U.S. Energy Information Agency, Weekly Retail Gasoline and Diesel Prices, https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_r50_w.htm
U.S. Energy Information Administration, Europe Brent Spot Price FOB, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RBRTE&f=M
[10] February and March 2026 values are forecasts of the CEC total refinery margins based on the thirty-seven months of Los Angeles 3-2-1 crack spread.
[11] https://www.eia.gov/finance/markets/products/prices.php

As can be seen in the chart above, the Los Angeles 3-2-1 crack spread closely tracks the refinery submissions to the California Energy Commission as required by Senate Bill 1322. The crack spread can also be readily calculated over the past decade.

As has been observed previously, California gasoline margins appear to increase as costs increase. As written in a simple formula:

Los Angeles 3-2-1 crack spread = a + b x Brent Crude Price

The relationship between the actual margin and the primary input – oil – can be inferred from the following regression:

Cochrane-Orcutt AR(1) regression with iterated estimates

Linear regression

Number of obs	= 119
F(1, 117)	= 3.43
Prob > F	= 0.0665
R-squared	= 0.0349
Root MSE	= .17874

crack	Coefficient	Semirobust std. err.	t	P>|t|	[90% conf.	interval]
brent	.1774864	.0958078	1.85	0.066	.0186389	.336334
_cons	.9983774	.1822864	5.48	0.000	.6961499	1.300605
rho	.7545375					

Durbin-Watson statistic (original) = 0.610558
Durbin-Watson statistic (transformed) = 1.881933

The estimated coefficient for "b" in the formula above is .1774864. This can be interpreted as a 17-cent increase in the Los Angeles 3-2-1 crack spread for each dollar increase in the Brent crude price per gallon. Or more directly: bad news for consumers has been good news for refineries over the past decade.

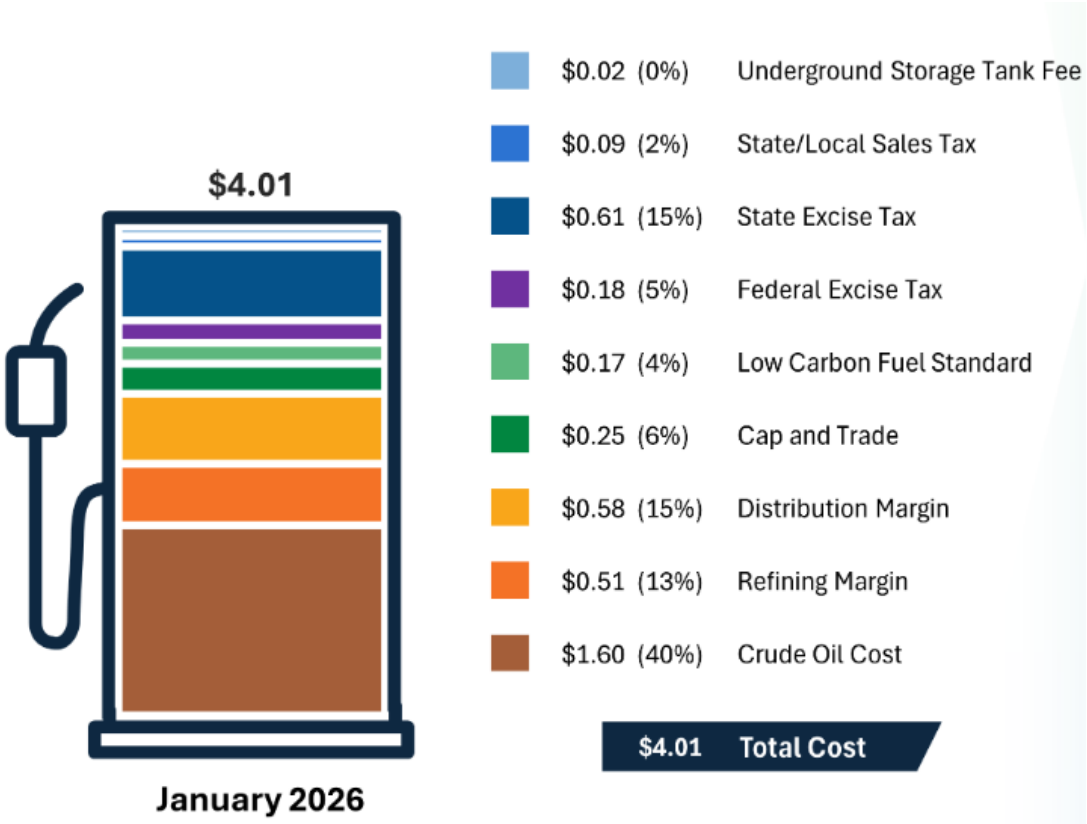
There is nothing particularly surprising about oligopoly pricing in a relatively isolated market. Either through parallel pricing by a few competitors or collusion, the oligopolists can benefit from adverse events. The jump in the Los Angeles 3-2-1 crack spread in March reflects California's experience at the start of the Russian invasion of Ukraine, when the Los Angeles 3-2-1 crack spread also increased from $1.30/gallon in February 2022 to a high of $2.28 in May – closely following the increase in Brent oil prices.

Filings under Senate Bill 1322 are lagged several months, so we will not see the actual margin filings before summer, but history and statistical evidence indicates that a significant component of gasoline price increases is additional profit.

Are Environmental Programs Causing Increased Gasoline Bills This Spring?

No.

We can look at the January estimates of gasoline price components from the California Energy Commission to see what evidence there is that environmental programs are actually responsible for the rapid run-up in prices:



12

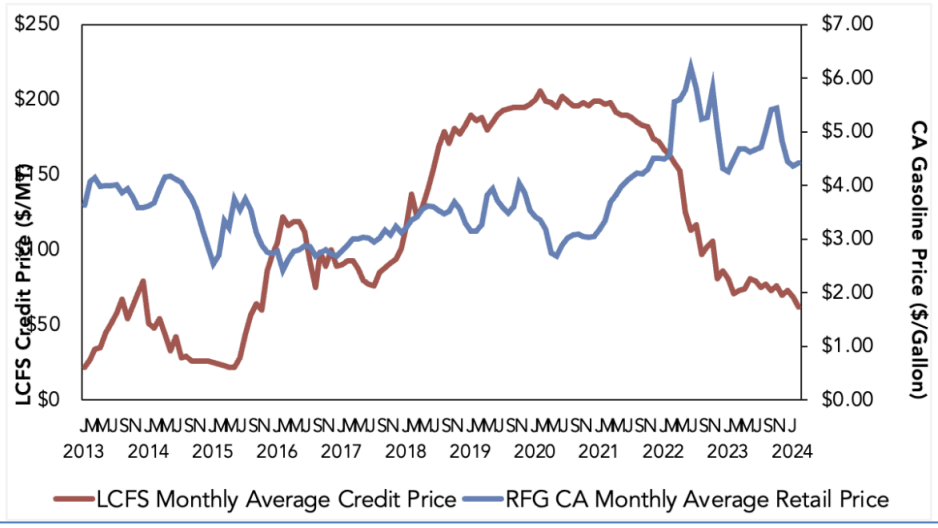
In January, the major components of gasoline prices were the crude oil cost (40%), the refining margin (13%), and the distribution margin (15%). These total 58% of the price

[12] Estimated Gasoline Price Breakdown and Margins, https://www.energy.ca.gov/estimated-gasoline-price-breakdown-and-margins

at the pump. In March, the cost of crude had increased to $2.38/gallon. The refining margin as measured by the Los Angeles 3-2-1 crack spread had increased $.25/gallon. [13] State and Federal excise taxes are fixed as is the underground storage tank fee. The only tax that increases with prices is the relatively low state and local sales tax.

Actual reports on March costs of the Low Carbon Fuel Standard and Cap and Trade are not due from the California Air Quality Resources Board for several months, but it is significant that CARB has found that there is no relationship between California gasoline prices and LCFS trades:

The *graphic* below shows the changes in the LCFS credit prices and fuel prices for gasoline, showing no relationship between the two.



[14,15]

[13] U.S. Energy Information Administration, California All Grades All Formulations Retail Gasoline Prices, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMM_EPM0_PTE_SCA_DPG&f=M
U.S. Energy Information Administration, Europe Brent Spot Price FOB, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RBRTE&f=M

[14] LCFS Facts_Fall2024.pdf, https://ww2.arb.ca.gov/sites/default/files/2025-06/LCFS%20Facts_Fall2024.pdf

[15] A detailed statistical analysis supports CARB's conclusion of an absence of correlation between real Brent prices and real LCFS transaction prices.

The Cap and Trade program has also shown little price volatility in 2026:

Auction Name	Total Current Auction Allowances Offered	Total Current Auction Allowances Sold	Current Auction Settlement Price	Total Advance Auction Allowances Offered	Total Advance Auction Allowances Sold	Advance Auction Settlement Price
February 2026 Joint Auction #46	54,975,757	54,975,757	$27.94	6,481,750	6,263,000	$27.94
November 2025 Joint Auction #45	51,253,305	51,253,305	$28.32	6,847,750	6,847,750	$29.61
August 2025 Joint Auction #44	51,883,970	51,883,970	$28.76	6,847,750	6,847,750	$28.50
May 2025 Joint Auction #43	51,069,285	43,865,000	$25.87	6,847,750	6,847,750	$26.15
February 2025 Joint Auction #42	51,466,028	51,466,028	$29.27	6,847,750	6,847,750	$28.00
November 2024 Joint Auction #41	52,629,612	52,629,612	$31.91	7,211,000	7,211,000	$30.16
August 2024 Joint Auction #40	51,179,715	51,179,715	$30.24	7,211,000	7,211,000	$29.75
May 2024 Joint Auction #39	51,589,488	51,589,488	$37.02	7,211,000	7,211,000	$38.35
February 2024 Joint Auction #38	51,216,056	51,216,056	$41.76	7,211,000	7,211,000	$41.00
November 2023 Joint Auction #37	57,617,565	57,617,565	$38.73	7,577,000	7,577,000	$37.40
August 2023 Joint Auction #36	55,760,384	55,760,384	$35.20	7,577,000	7,577,000	$34.16

[16]

Overall, settlement prices in the Cap and Trade program have remained stubbornly close to the floor.

Recently, Andy Walz of Chevron wrote in a letter to Governor Newsom:

> In the 2018 Cap-and-Trade Updated Standardized Regulatory Impact Assessment (SRIA), CARB estimated that for every $10.00 of allowance price, the price of gasoline could increase by about $0.09 per gallon. If allowance prices hit the price ceiling of approximately $135 in 2030 as predicted by UC Davis, C&I would contribute $1.21 per gallon to California gasoline prices.[17]

His statement is a maze of misleading quotations. The first sentence is taken out of context from the following paragraph:

> For example, with complete cost pass-through, for every $10.00 of allowance price, the price of gasoline could increase by about $0.09 per gallon. This cost will be directly faced by individuals purchasing these fuels in California and will also increase the price of delivered goods and services

[16] Summary of Auction Settlement Prices and Results, https://ww2.arb.ca.gov/sites/default/files/2020-08/results_summary.pdf.

[17] CARB's Proposed Cap-and-Invest Regulation will raise the price of gasoline, threaten the reliability of California's fuel supply, impact California jobs, and threaten energy security for America, Andy Walz, March 9, 2026, page 1.

> to Californians. To the extent that the Amended Regulation could result in higher allowance prices than the current Regulation, consumers could face higher fuel price impacts. The future allowance price is highly uncertain, but will be bound by the Auction Reserve Price (which is set through 2030) and the price ceiling, which will be determined throughout the regulatory process.
>
> Consumers may also substitute away from forms of transportation and fuels as well as goods and services that reflect a carbon price.[18]

There are at least three caveats (underlined above) in the paragraph that Mr. Walz is citing:

1. The full cost of the increase will be passed through to consumers;
2. the future allowance price is uncertain; and,
3. the allowance price will be set at the price ceiling.

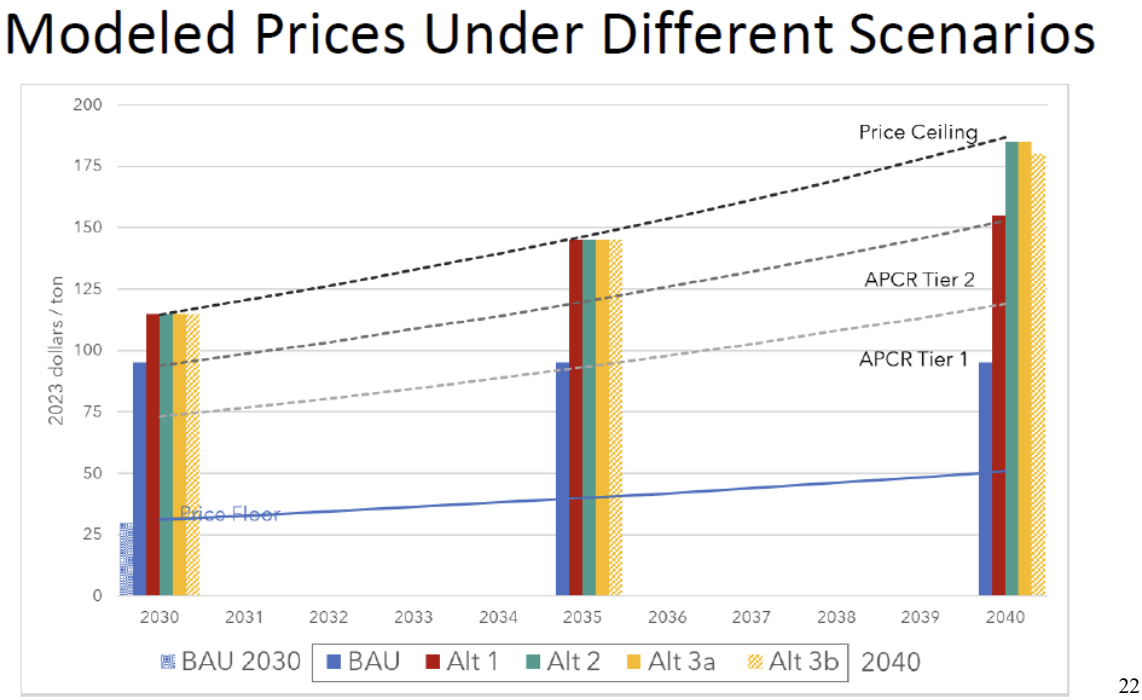
Obviously, the authors in 2018 were simply illustrating a possible calculation and not making a forecast. They did not estimate the proportion of passthrough, predict the carbon price, or the price ceiling.

Mr. Walz goes on to cite a second study that generally does not agree with his conclusion.[19] Professor Bushnell and his team first estimate a mean elasticity of -.4.[20] This means that a 1% increase in price will reduce demand by .4%. Thus the assumption that the price is set by the ceiling requires checking whether consumer response will reduce the price below the ceiling.

Professor Bushnell then employs a Monte Carlo model to forecast what happens under a variety of assumptions.[21] He reports a host of results over a number of different assumptions:

---

[18] Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation UPDATED STANDARDIZED REGULATORY IMPACT ASSESSMENT, California Air Resources Board, September 4, 2018, page 55. Emphasis supplied.
[19] Allowance Supply and Demand in California's Cap-and-Trade Market: Initial Results
James Bushnell, Aaron Smith, Wuzheqian Xiao, Julie Witcover UC Davis, November 16, 2023.
[20] Ibid., page 11.
[21] The term "Monte Carlo" is a modelling technique that runs many different combinations of critical variables to provide an estimate of a distribution of possible outcomes.



[22]

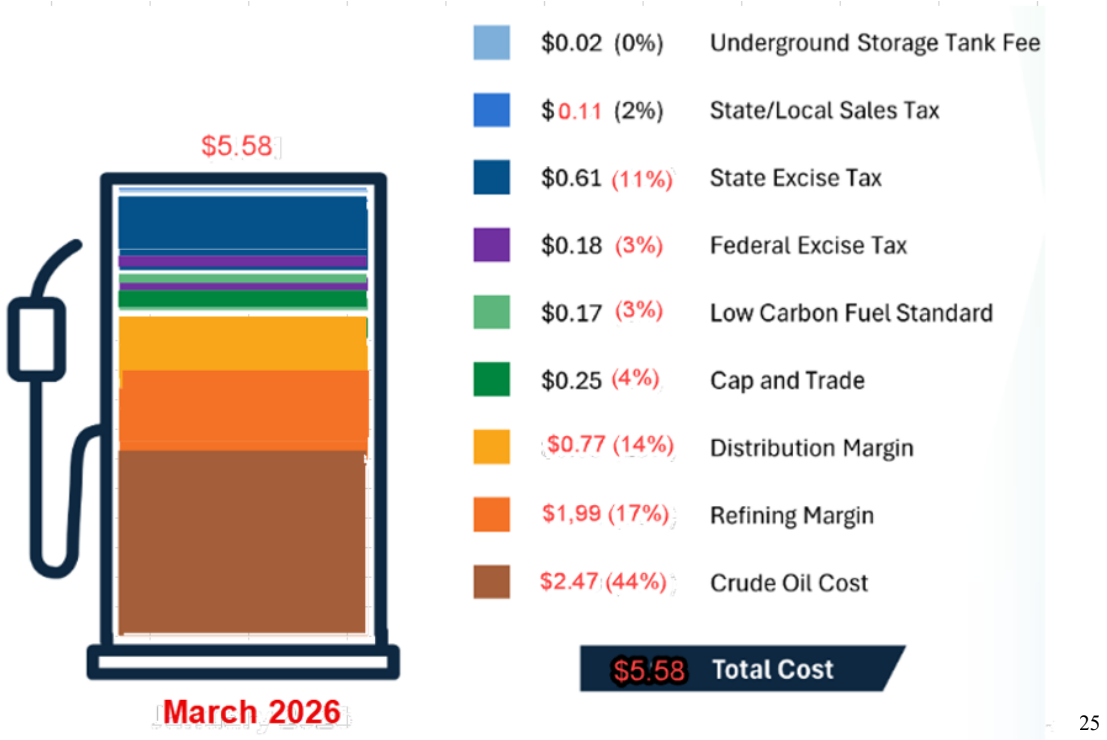
The actual conclusions stated by Professor Bushnell are that "Most alternative scenarios yield prices that follow the price ceiling through at least 2035."[23] However, his Business As Usual (BAU) forecast is at the price floor.

Neither of his sources supply the strong statement that Mr. Walz has made to Governor Newsom.

California's climate programs are not only one of the smallest line items in the gas bill — they are paying dividends that will help shield consumers from volatile prices in the future. Since 2013, California's cap-and-invest program has generated $34 billion in revenue and funded over 500,000 projects – zero-emission school buses, wildfire prevention, safe drinking water – all while the state's GDP grew by 81%. Over the next 20 years, this program is expected to generate $56 billion to benefit utility ratepayers.[24]

[22] Ibid., page 21.
[23] Ibid., page 22.
[24] CARB Proposes Updates to Cap-and-Invest Program | California Air Resources Board, CARB Proposes Updates to Cap-and-Invest Program | California Air Resources Board.

Contrary to statements that increased gasoline prices are due to environmental programs, the major increases are in the price of oil and refiners' margins. The chart below shows a forecast of expected reports for March 2026:



[25]

The values highlighted in red are updates available in early April. These are estimates, of course, since we will not see the CEC's numbers for several months. Notwithstanding, the impact on gasoline prices is due to the worldwide price of oil and market power in the California markets, not CARB's environmental programs.

Options When Asian Imports Are Limited

Chevron refining executive Andy Walz recently claimed that both a lack of refined fuel from Asia and the cost of California's environmental programs have created an energy crisis in the state that could lead Chevron to close its refineries. These claims are, at best, poor economics, and at worst, intentionally misleading.

On March 24, 2026, Walz told Bloomberg:

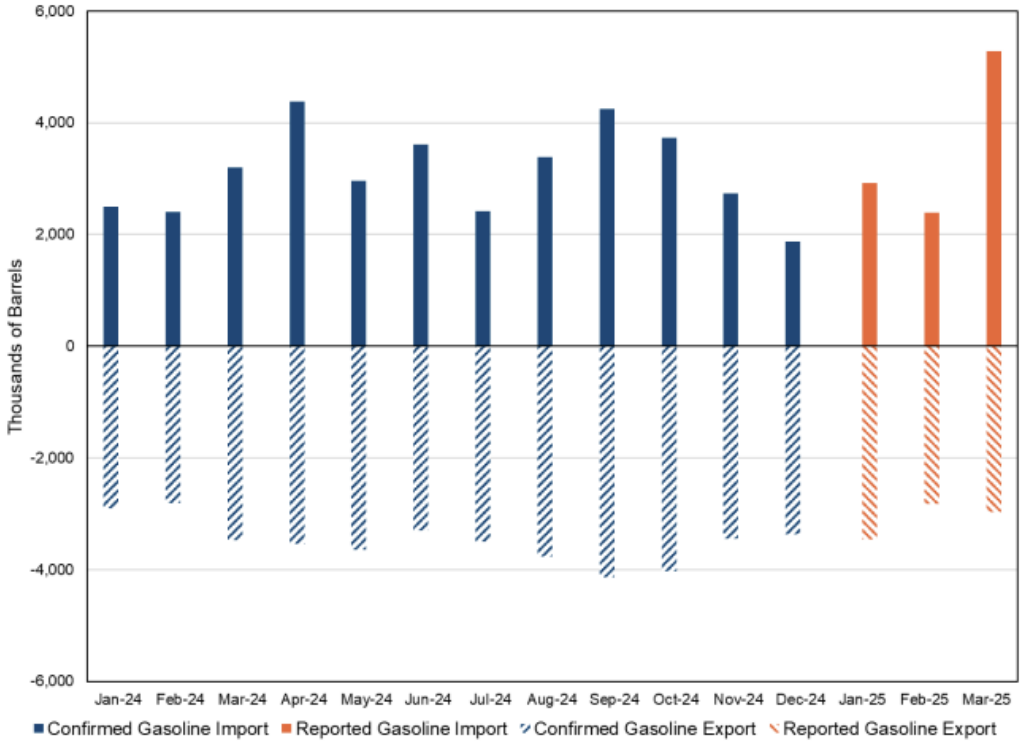
[25] Estimated Gasoline Price Breakdown and Margins through March 2026.

> "We have refineries in Asia that are having to cut crude, and so they're going to make less products," Walz said in an interview Tuesday. "What if San Francisco doesn't have the jet fuel it needs? Or Los Angeles? Or maybe gasoline?"[26]

California imports some of its refined fuels, but why rely on Asian imports in a time of crisis? For years, the state has often exported more gasoline than it has imported—while the fuel standard and cap-and-trade were in effect—according to CEC data. In a time of market instability, domestic refiners could sell more to their own country.

Data on California's gasoline imports and exports are sparse. The best source is the CEC's "Quarterly Petroleum Supply and Pricing Report." The CEC chart below summarizes gasoline imports and exports in 2024 and early 2025:

Figure 11: California Gasoline Imports and Exports

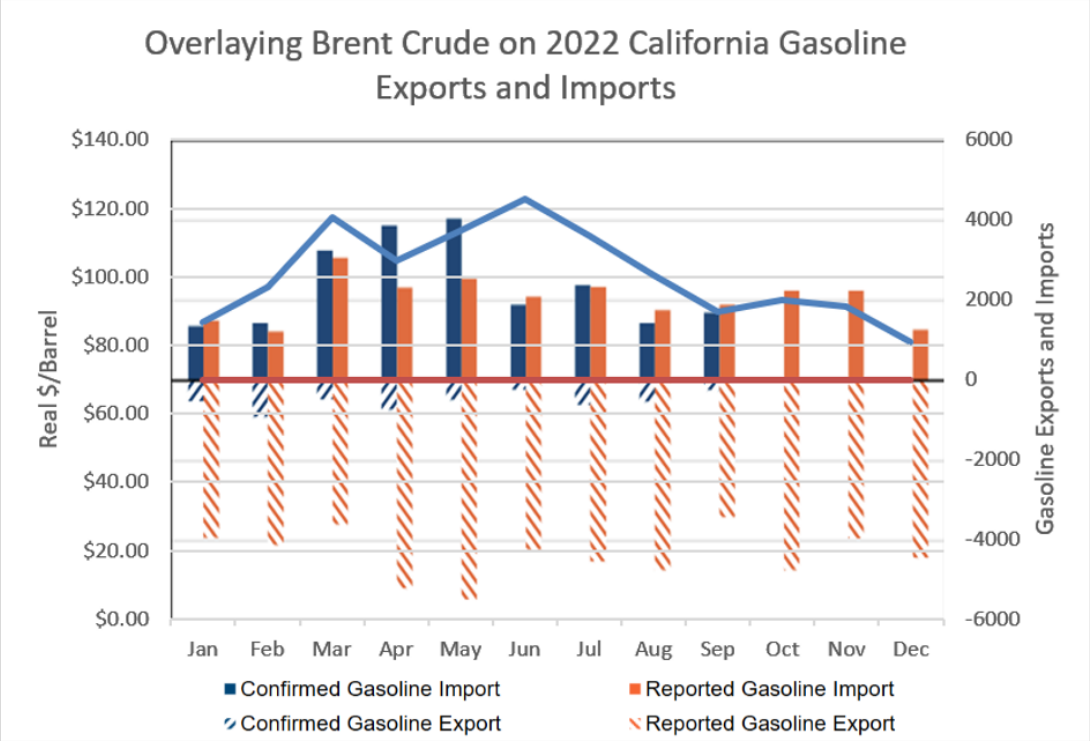


27

[26] Chevron Warns California Risks Fuel Crisis Unless Iran War Eases, Bloomberg, Nathan Risser and Kevin Crowley, March 24, 2026, page 1.
[27] Quarterly Petroleum Supply and Pricing Report, January 2025 Through March 2025, July 2025 | CEC-200-2025-02, Page 18.

This report reveals a complex market where California's exports of gasoline actually exceeded imports for 11 of the 15 months examined, and the state was a net exporter of gasoline from January 2024 through March 2025. This indicates that California is not supply-constrained in the way Chevron suggests. If refineries were unprofitable or supply was insufficient, we would expect persistent net imports—not exports.

It is also informative to look at CEC's data from 2022, the period of high prices after the Russian invasion of the Ukraine:



28,29

The 2022 trajectory of Brent crude prices closely resembles prices we are now experiencing in 2026 as the war in Iran is rapidly raising oil and gasoline prices worldwide. Exports of gasoline exceeded imports in every month of 2022.

---

[28] Quarterly Petroleum Supply and Pricing Report October 2022 through December 2022, March 2023, page 12 and real Brent prices per barrel from Europe Brent Spot Price FOB (Dollars per Barrel).

[29] Source: CEC PIIRA data – California Imports, Exports, and Intrastate Movements Weekly Report (Form 700) Note: "Reported Gasoline" data is reported directly to the CEC through Form 700. "Confirmed Gasoline" is Form 700 data that is confirmed with Port Import/Export Reporting Service (PIERS), California State Lands Commission (SLC), and Energy Information Administration (EIA) data through September 30, 2023.

Chevron's comments to the press raising the possibility of California facing a shortage of gasoline as the crisis in the Middle East drags on are a curious inversion of the facts.

What Chevron doesn't mention is that the U.S. is the world's largest oil producer and we export oil. Oil shipments from other western basins are a distinct option also addressed by the CEC's quarterly reports. Oil from the new fields in Alberta, British Columbia, Colorado, North Dakota, and Wyoming are available sources by rail.

Conclusions

The West Coast of the U.S. has a highly concentrated supply system with serious concerns about market power and collusion in pricing. Statistical evidence indicates that California oil refiners actually increase their profit margins when global oil prices increase. Contrary to claims that the cost increases reflect California's environmental programs, these are not correlated with gasoline prices. The reality is that gas prices are most impacted by global market dynamics, and dependence on petroleum for transportation is an expensive option in an uncertain world.

Per Chevron's statements that it may close refineries in response to reduced imports of refined fuels, the data they cite are questionable, at best. California both imports and exports gasoline – frequently exporting more than it imports.