

Katherine Douglas

Public Comment - Group 2

3



From: Morgan Downes <morgandownes@ucsb.edu>
Sent: Wednesday, October 15, 2025 5:55 PM
To: sbcob
Subject: Public Comment on Oil and Gas Phase-Out Ordinance

Caution: This email originated from a source outside of the County of Santa Barbara. Do not click links or open attachments unless you verify the sender and know the content is safe.

Hello,

As your constituent, I am writing to urge your support for a strong Oil and Gas Phase-Out Ordinance. Your support for this ordinance is essential in ensuring a safe and sustainable future for our planet. I also request subsequent just transition programming to assist oil and gas industry workers in transition to other employment sectors.

Best,
Morgan Downes

Katherine Douglas

From: Debbie Allen <debbieinsb@gmail.com>
Sent: Wednesday, October 15, 2025 7:30 PM
To: sbcob
Subject: Public+Comment+on+Oil+and+Gas+Phase-Out+Ordinance

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Fossil Fuel Phase Out

Santa Barbara takes pride in Earth Day that began in response to an Oil Spill. I urge you to advance the policy plan to phase out our dependence on oil and not allow any oil company to come in and develop the infrastructure for more oil drilling or fracking. We have all witnessed the devastating impact of oil spills on our wildlife. Oil Companies have repeatedly betrayed the environment and put our lives at risk. Let's be the county that sets the example for the nation!

Katherine Douglas

From: Paasha Mahdavi <paasha.mahdavi@gmail.com>
Sent: Thursday, October 16, 2025 11:51 AM
To: sbcob
Subject: Submitting Public Comment report for Oct 21 2025 Hearing, Item 25-00921
Attachments: Mahdavi_SBC Oil Analysis.pdf

Caution: This email originated from a source outside of the County of Santa Barbara. Do not click links or open attachments unless you verify the sender and know the content is safe.

Dear Clerk of the Board,

I am writing to formally submit a report as Public Comment for the Board of Supervisors hearing on October 21, 2025, regarding Item 25-00921, which I hope you can also enclose in the packet sent to the Board of Supervisors prior to the hearing.

Please confirm receipt of this email and inclusion of the report in the hearing attachments for 25-00921.

Kindly,
Paasha Mahdavi

Oil Production in California and Santa Barbara County

Prepared by Paasha Mahdavi ¹

October 2025

Introduction

On average, producing a barrel of oil in Santa Barbara County emits more greenhouse gases because more energy is needed to produce our oil compared to a barrel of oil imported from abroad. In addition, oil production in the county is relatively expensive to produce.

This factsheet provides details on oil production in the state and county based on data from government agencies and from scientific reports by petroleum engineers. A report prepared for state legislators is included here as an appendix which provides specifics on the data sources and analysis.

¹ Associate Professor and Director of the Energy Governance and Political Economy (EGAPE) Lab at UC Santa Barbara. Mahdavi holds degrees in economics (B.A), international energy policy (M.A.), statistics (M.S.), and political science (Ph.D.) from Columbia University, Stanford University, and UCLA. Mahdavi is solely responsible for the analysis contained in this report, which does not represent or reflect the positions of the University of California. Correspondence: paasha.mahdavi@gmail.com.

1. California's oil is worse for the climate than nearly all other oil supplied to state refineries

The average carbon intensity of in-state onshore production is higher than nearly all other barrels supplied to the state's refineries.² In addition, most imports to the state are cheaper on a per-barrel basis because oil is easier to extract in other parts of the world. Operating costs for a typical barrel here range around \$45, compared to Saudi Arabia (\$9), Iraq (\$11), Colombia (\$11), Ecuador (\$7-\$20), and Brazil (\$21- 28).³

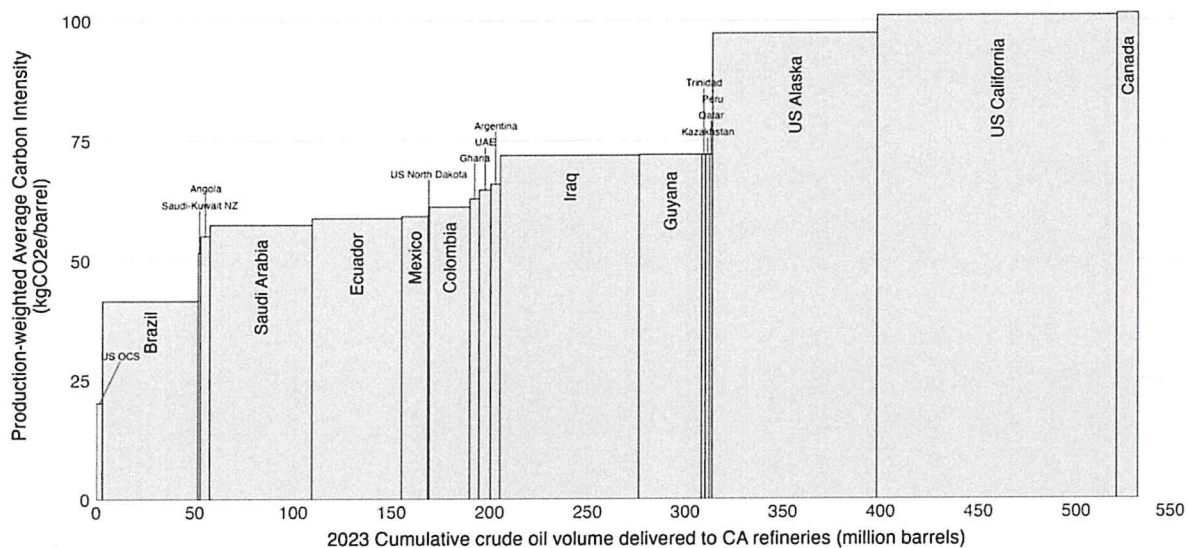


Figure: Carbon intensity of crude oil supplied to Californian refineries.

Author analysis based on California Air Resources Board data. Bars are arranged by production-weighted average carbon intensity, from lowest to highest, with box width denoting amount of crude oil supplied to California refineries in 2023. Carbon intensity values are drawn from the California Air Resources Board 2023 Low Carbon Fuel Standard – Crude Oil Life Cycle Assessment. Carbon intensities are aggregated by country/state, using a production-weighted average based on 2023 volume of crude supplied to state refineries.

² Data are drawn from California Air Resources Board *2023 Low Carbon Fuel Standard – Crude Oil Life Cycle Assessment*: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/crude-oil/2023_Crude_Average_CI_Calculation_final.pdf. Estimated intensities from out-of-state crude oil include emissions related to processing and shipping crude oil to the state, as the California Air Resources Board notes that its emissions intensity factors are “attributed to the production and transport of the crude oil supplied as petroleum feedstock to California refineries.”

³ California's operating cost is drawn from the Federal Reserve Bank of Dallas average shut-in prices for non-shale outside of Texas; Saudi and Iraqi oil costs are drawn from Rystad Energy; Colombia estimates are from Ecopetrol via the Rio Times; Ecuador estimates are from PetroAmazonas via the Baker Institute; and Brazil estimates are drawn from Enverus data on pre-salt breakeven costs, plus an assumed \$3/barrel administrative and transportation cost

2. Santa Barbara's oil is particularly bad for the climate

The Cat Canyon and Orcutt oil fields—the county's two largest producers—rate among the highest across the state in terms of greenhouse gases emitted to produce one barrel of oil, referred to as emissions intensity.⁴ Within California, the Orcutt field is the third highest in per-barrel emissions of methane, behind only the North Belridge and Elk Hills fields in Kern. The total emissions intensity of the Cat Canyon field is higher than three-fifths of the imported oil processed by California's refineries. These figures are likely to increase going forward given the need for steam injection to extract remaining reserves, which increases the energy intensity of production and operational emissions.

Altogether, oil operations in the county contribute 132,356 MtCO₂e in greenhouse gas emissions annually, which is roughly 10% of county-wide emissions from all sources.⁵

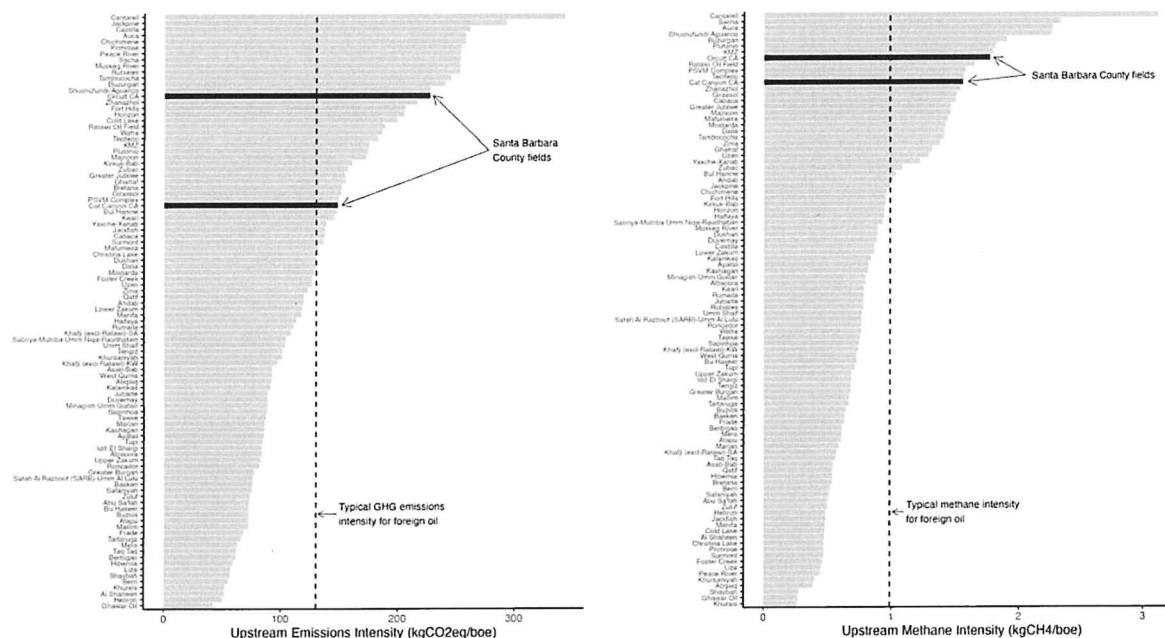


Figure: Emissions intensity of Santa Barbara oil compared to imports

Author analysis based on OCI+ data for fields in producing countries which export oil to Californian refineries, comparing Santa Barbara County fields (black) to imports (gray) in terms of overall upstream emissions intensity (left panel) and upstream methane intensity (right panel). Oil from fields in Alaska and California are excluded. Bars are arranged by field-level emissions intensity, from highest to lowest, with oil field labels provided to the left of each bar. Vertical dotted line in each plot shows the median emission intensity for foreign oil imported to California. Data source: RMI, Oil Climate Index plus Gas Model v.3.2.0 (2025).

⁴ This analysis is based on figures from RMI, Oil Climate Index plus Gas Model v.3.2.0 (2025); Mohammad S. Masnadi et al., Global carbon intensity of crude oil production. *Science* 361,851-853 (2018); Scarpelli, T. R., Jacob, D. J., Grossman, S., Lu, X., Qu, Z., Sulprizio, M. P., Zhang, Y., Reuland, F., Gordon, D., and Worden, J. R.: Updated Global Fuel Exploitation Inventory (GFEI) for methane emissions from the oil, gas, and coal sectors: evaluation with inversions of atmospheric methane observations. *Atmos. Chem. Phys.*, 22, 3235–3249 (2022).

⁵ Rincon Consultants. "Santa Barbara County Petroleum Production Activity GHG Emissions Analysis." Accessed: santabarbara.legistar.com/View.ashx?M=F&ID=14158455&GUID=0F0AF9F8-CCFB-4A70-8DDE-8873EDC752E6

3. Most existing wells in Santa Barbara have been producing for more than 40 years or have produced more than 100,000 barrels of oil

The figure below shows the 899 active oil wells in the county with data from state agencies on production levels and start dates. These two dimensions are among several which determine whether a well has recovered its costs, or what is known as amortization.⁶ From these data, 79% of active wells in the county first began producing more than 15 years ago and 62% first began producing more than 40 years ago. Roughly half (51%) of all existing active wells have produced over 100,000 barrels of oil over the course of their operating history, and 19% have produced over 250,000 barrels.

To put this in context, a single well that has produced 100,000 barrels cumulatively since 1985 has generated roughly \$7.3 million in revenue over the course of its operations.⁷ Without taking into account debt structures and other expenses, it is likely that such a well has reached and exceeded amortization. Just under three-quarters (666 wells out of 899) have either produced more than 100,000 barrels in their lifetimes or have been producing for over 40 years.

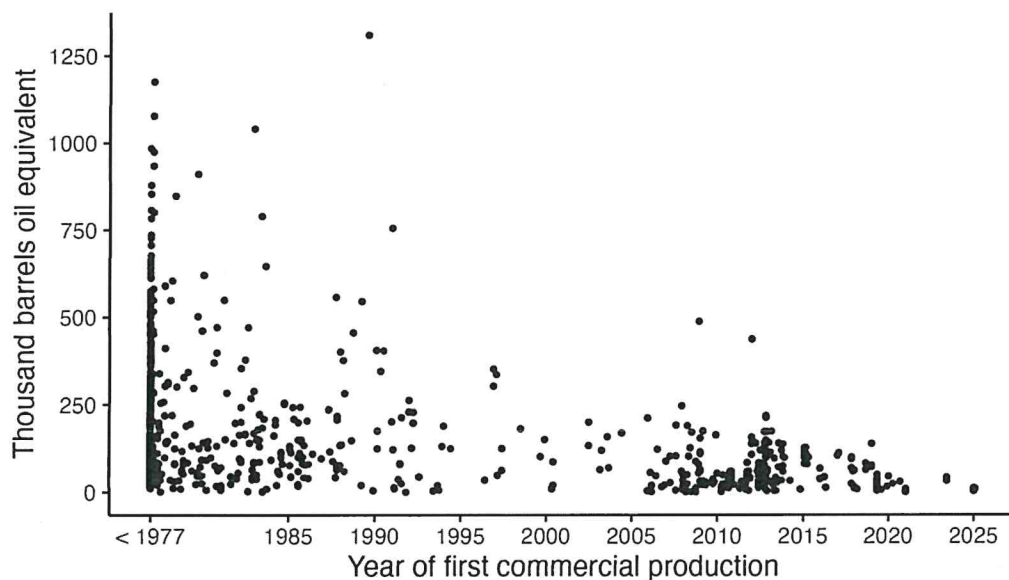


Figure: Cumulative production of oil wells in Santa Barbara by first production date

Author analysis based on CalGEM data for all active wells in Santa Barbara county with reported first date of commercial production. Years prior to 1977 are binned together given imprecision in first production date data prior to this year in the WellSTAR database.

⁶ City of Los Angeles, Office of Petroleum and Natural Gas Administration and Safety. "Oil Production Facilities and Existing Wells Amortization Study FAQ." Published December 2, 2022. Accessed from: https://cityclerk.lacity.org/online/docs/2017/17-0447-S3_misc_2_5-23-23.pdf

⁷ Based on an average spot crude price for the 1985-2024 period, adjusted for inflation to 2024 US dollars, drawn from S&P Global Commodity Insights via the Energy Institute.

APPENDIX

Reproduction of:

“Analysis of California’s oil refineries amid declining demand”

Prepared by Paasha Mahdavi

Previously published September 2025

Introduction

Demand for petroleum products in California continues to decline as a result of efficiency gains through improved average fuel economy and fuel switching through rising sales of electric vehicles.¹ Based on historical demand and future demand in the absence of new policies, the California Energy Commission (CEC) projects this decline will continue at a pace of 1.6% annually, with an expected 30% decline in gasoline consumption from 12.3 billion gallons per year in 2023 to about 8.4 billion per year by 2045.² As a result, refineries within the state will have to either (1) adapt, such as converting to produce renewable fuels or chemical feedstocks; (2) maintain production, and export products out of state; (3) reduce production of refined oil products; or (4) shut down.

In July 2025, Governor Newsom proposed draft legislation that raises questions as to whether increasing near-term crude oil production could sustain the state’s refineries and stabilize fuel prices.³ The analysis presented here shows that increasing in-state oil production will not solve the refinery challenge. In the process, increasing or even maintaining in-state oil production will continue to harm communities that are exposed

¹ California Energy Commission. (2024), *Commission Report – Transportation Fuels Assessment*, August, CEC-200-2024-003-CMF: <https://www.energy.ca.gov/publications/2024/transportation-fuels-assessment-policy-options-reliable-supply-affordable-and>.

² California Energy Commission. (2024). *Commission Report*.

³ <https://atrn.assembly.ca.gov/system/files/2025-08/petroleum-market-stabilization-rn-7.15.25.pdf>

to the health-damaging effects of oil operations, and will lead to higher greenhouse gas emissions that increase the impacts of climate change.

This briefing draws on scientific studies and data from state agencies to show evidence for three findings:

1. Despite planned refinery closures, statewide gasoline demand over the next six years can continue to be met by supply from in-state refineries and **historical** levels of imported gasoline from out of state, such that there is no need for *increased* gasoline imports compared to prior levels. Based on existing capacity factors, the remaining seven gasoline-producing refineries have the capacity to produce roughly 784 thousand barrels per day of California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB). This is near the maximum in-state consumption of gasoline projected for 2026.⁴, with imports of refined products at prior levels sufficient to cover remaining demand accounting for out-of-state exports.
2. Despite declining in-state oil production, the state's existing crude oil import capacity and port infrastructure is sufficient to supply California refineries. The Governor's goals of stabilizing refinery input can therefore be met with a combination of in-state production at existing decline rates and imports of crude oil from out of state. As is the case for future imports of gasoline, there is no need for *increased* crude oil imports; any further imports of crude oil from out of state would not exceed past levels.
3. Transitioning California towards a clean energy future has significant health and climate benefits. As California's oil production declines at existing rates and as demand for oil continues to drop, any replacement of in-state oil with foreign oil to California's refineries will lead to reduced greenhouse gas emissions. This is because the average barrel of imported oil supplied to state refineries is produced with fewer emissions than the average barrel of oil produced in the state.

The report concludes with a discussion of alternate pathways for managing what scientists refer to as the “mid-transition” that Californians face.⁵ In doing so, it emphasizes options recommended by the CEC to the Governor's Office in its June 2025 letter to “support necessary import of refined fuel products” and “develop and execute a holistic transportation fuels transition strategy.”⁶

⁴ Imports of refined products that do not exceed prior levels will likely still be needed because refineries may continue to choose to produce non-CARB formulated gasoline for out-of-state export, consistent with existing practices by refineries selling products to other states or abroad. In such cases, there would still be a gap between refinery output and in-state consumer demand that would have to be met with imported gasoline.

⁵ Grubert, Emily, & Hastings-Simon, Sara. (2022). Designing the mid-transition: A review of medium-term challenges for coordinated decarbonization in the United States. *WIREs Climate Change*, 13(3), e768.

⁶ Page 4, California Energy Commission Vice Chair Gunda letter to Governor Newsom, June 27, 2025;

[https://www.energy.ca.gov/sites/default/files/2025-07/CEC%27s Response to Governor Newsom%27s Letter June-27-2025_ada.pdf](https://www.energy.ca.gov/sites/default/files/2025-07/CEC%27s%20Response%20to%20Governor%20Newsom%27s%20Letter%20June-27-2025_ada.pdf)

1. California's gasoline demand can be met with existing refinery CARBOB production capacity and existing gasoline import capacity

In a presentation to a Joint Oversight Hearing of the Assembly Natural Resources, Transportation, and Utilities and Energy Committees on August 20, 2025, the California Energy Commission, Division of Petroleum Market Oversight, and the California Air Resources Board showed that in-state refinery capacity would fall short of consumer demand for gasoline upon the closure of the Valero Benicia refinery in spring of 2026.⁷ The Agenda for the Hearing included one visualization of this analysis, reproduced here as **Figure 1**. A closer look at the data underlying this graph reveals two mistaken assumptions that result in an inflated gap between supply and demand.

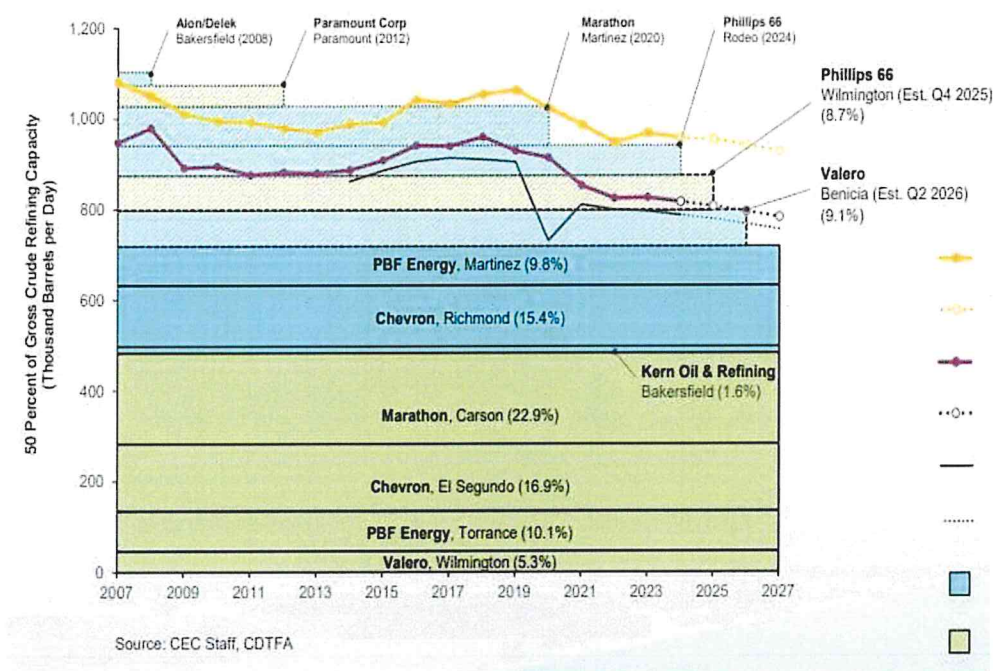


Figure 1. Reproduced from *Agenda for Joint Oversight Hearing of the Assembly Natural Resources, Transportation, and Utilities and Energy Committees, August 20, 2025, page 5.*

Figure caption from page 5 of the Agenda: “Peak CARBOB Gasoline Refinery Capacity (approximate) Overlaid with Maximum Monthly Consumption (in-state: purple line; with exports: yellow line), with northern California (blue bars), southern California (green bars).”

⁷ Slide 22, Joint Agency presentation to Assembly Utilities and Energy, Transportation, and Natural Resources Committees, August 20, 2025. A similar graphic was presented at an earlier hearing on May 28, 2025: https://autl.assembly.ca.gov/system/files/2025-05/agency-slides_asm_ue_oversight-hearing_petroleum_05-28-25.pdf.

First, in Figure 1, the proportion of total refinery output that is CARBOB gasoline (as opposed to non-CARB formulated gasoline, diesel, jet fuel, and other products) is limited to 50%, which is represented on the vertical axis of the graph. The CEC's calculations of gasoline capacity in late 2024 showed that this capacity is roughly 60%, which had been shown in prior visuals from the Commission.⁸ This is in line with historical trends: since 2020, weekly CARBOB gasoline capacity produced by in-state refineries has averaged 58.5% (low: 44.7%, high: 71.6%) of total refinery capacity, with a recent maximum of 884,286 barrels per day of CARBOB gasoline produced during the week of May 16 2025.⁹

Taking a 60% capacity factor into account, total in-state refinery capacity to produce CARBOB gasoline after the closures of the Valero Benicia and Phillips 66 Wilmington refineries is estimated at 784,003 barrels per day, as compared to the roughly 720,000 barrels per day using the 50% capacity factor indicated in Figure 1.¹⁰ With the CEC's projections of maximum in-state monthly demand for gasoline (less ethanol) in 2027 at 785 thousand barrels per day, refinery capacity will only be roughly 1,000 barrels per day short of projected.¹¹ Even after factoring in out-of-state demand—which reflects existing practice by refineries to export non-CARB formulated products across state borders—projected demand that would exceed in-state refinery capacity would still be well within the state's historical capacity for importing refined products from out of state. In March 2025, for example, the CEC reported average gasoline imports of 170,967 barrels per day.¹²

⁸ Slide 13, Transportation Fuels Assessment: Overview and Presentation of Policies, May 3, 2024:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=256159>

⁹ Calculated from California Energy Commission 2025. *Refinery Inputs and Production*. Data last updated August 27, 2025. Retrieved September 1, 2025 from <https://www.energy.ca.gov/data-reports/reports/weekly-fuels-watch/refinery-inputs-and-production>

¹⁰ Calculated from California Energy Commission. (2024). California's Oil Refineries. Data last updated October 17, 2024. Retrieved September 1, 2025 from <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/californias-oil-refineries>.

¹¹ Projections for the 2027 maximum in-state monthly demand for gasoline (less ethanol) is based on the "Slow" transition scenarios published by the California Energy Commission: Page 27, *Commission Report – Transportation Fuels Assessment*, August 2024, CEC-200-2024-003-CMF: <https://www.energy.ca.gov/publications/2024/transportation-fuels-assessment-policy-options-reliable-supply-affordable-and>.

¹² Page 17, California Energy Commission, Quarterly Petroleum Supply and Pricing Report January 2025 Through March 2025: <https://www.energy.ca.gov/sites/default/files/2025-08/CEC-200-2025-020.pdf>

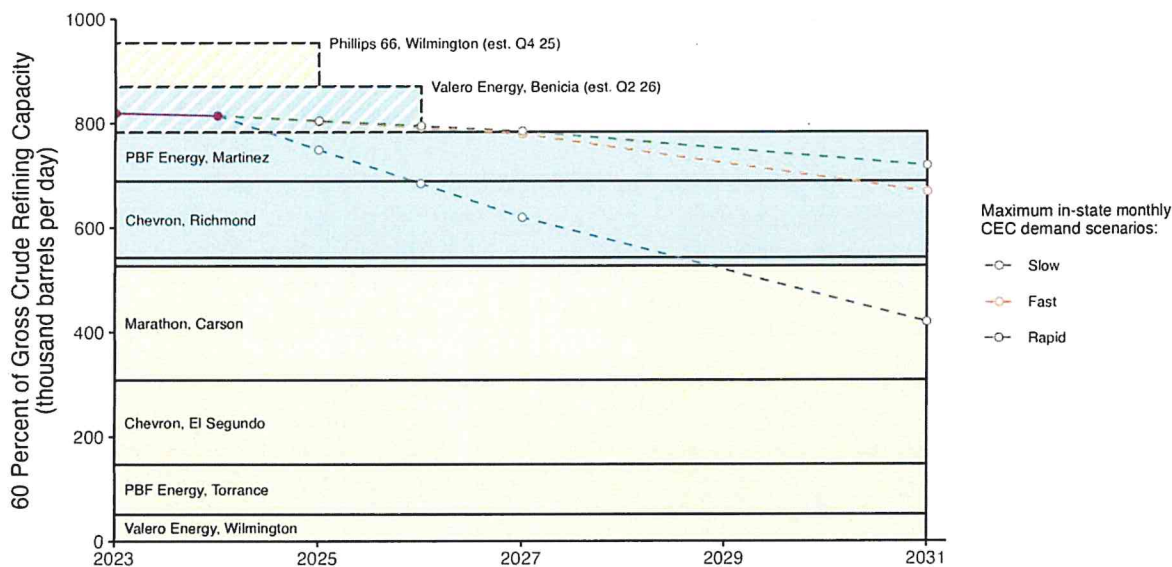


Figure 2. Refinery capacity and maximum in-state monthly gasoline demand across different CEC forecasts, in thousands of barrels per day.

Author analysis based on California Energy Commission, Division of Petroleum Market Oversight, and California Air Resources Board data. Refinery gasoline production capacity is plotted as stacked boxes for all in-state refineries with capacity to produce CARBOB gasoline based on CEC reports. Maximum In-State Monthly Demand for 2023 and 2024 (shown as purple points) is drawn from: slide 7, https://autl.assembly.ca.gov/system/files/2025-05/agency-slides_asm_ue_oversight-hearing_petroleum_05-28-25.pdf. Maximum In-State Monthly Demand for 2025+ (shown as green, orange, and blue points) is estimated based on scenarios from page 27, 2024 Transportation Fuels Assessment (CEC-200-2024-003-CMF). Refining capacity data from California Energy Commission. A 60 percent gasoline capacity factor is applied based on CEC estimates for the approximate maximum CARBOB production capacity of all refineries, which is averaged from refinery crude input processing capacity submitted in accordance with PIIRA. See page 13 of the 2024 Transportation Fuels Assessment (CEC-200-2024-003-CMF).

Second, the projected maximum in-state monthly demand for gasoline presented to the Assembly on August 20, 2025, is higher than all three scenarios that the CEC projected in its most recent Transportation Fuels Assessment.¹³ The CEC's demand projections are plotted in **Figure 2**, overlaying the total in-state refinery capacity using the CEC's 60 percent CARBOB gasoline capacity factor.¹⁴ Across all scenarios, the gap between in-state capacity and in-state demand—even after the closure of the Valero Benicia and

¹³ Slide 22, Joint Agency presentation to Assembly Utilities and Energy, Transportation, and Natural Resources Committees, August 20, 2025; Page 2, California Energy Commission, *Commission Report – Transportation Fuels Assessment*, August 2024, CEC-200-2024-003-CMF: <https://www.energy.ca.gov/publications/2024/transportation-fuels-assessment-policy-options-reliable-supply-affordable-and>.

¹⁴ Refinery data sourced from California Energy Commission. (2024). California's Oil Refineries. Data last updated October 17, 2024. Retrieved September 1, 2025 from <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/californias-oil-refineries>. The 60% capacity factor to produce CARB formulated gasoline is drawn from Page 2, California Energy Commission, *Commission Report – Transportation Fuels Assessment*, August 2024, CEC-200-2024-003-CMF: <https://www.energy.ca.gov/publications/2024/transportation-fuels-assessment-policy-options-reliable-supply-affordable-and>.

Phillips 66 Wilmington refineries—is within the range of imported gasoline capacity once exports to Arizona and Nevada (not plotted) are factored in.

In 2026, projected in-state refinery capacity of 784 thousand barrels of CARBOB gasoline is exceeded by projected in-state demand of 795 thousand barrels plus roughly 103 thousand barrels per day of gasoline exported out of state, with the need for 115 thousand barrels per day of imported gasoline.¹⁵ This import volume is within the status quo for the state’s port infrastructure, which has imported above 100 thousand barrels of gasoline in 9 of the last 12 months, and is not an increase from status quo import levels.¹⁶

Taken together, the analysis here indicates no evidence for excessive future shortages in gasoline supply. **By using the CEC’s own data appropriately in information presented to the Assembly—namely, moving from a 50% to a 60% CARBOB refinery capacity figure based on CEC assumptions in 2024 and on prior refinery data, and adjusting for future demand based on existing CEC scenarios—the data indicate that California’s gasoline demand can be met with existing refinery and gasoline import capacity.** If prior out-of-state export levels are maintained and refinery outages are minimal, there would be no need for any *increased* level of imported gasoline, nor any additional refinery capacity to be added; instead, any future demand following the closure of the Valero-Benicia and Phillips 66-Wilmington refineries will be supplied by existing in-state refinery capacity plus imports below or within historical ranges.

¹⁵ Gasoline exports are not projected here, but are drawn from the most recent estimates of exports by the California Energy Commission, which averaged 103,371 barrels per day in January-March 2025. See:

<https://www.energy.ca.gov/sites/default/files/2025-08/CEC-200-2025-020.pdf>. Rounding since it should be 114.

¹⁶ Page 18, California Energy Commission, Quarterly Petroleum Supply and Pricing Report January 2025 Through March 2025: <https://www.energy.ca.gov/sites/default/files/2025-08/CEC-200-2025-020.pdf>

2. Crude oil imports can keep California's refineries adequately supplied, at levels no higher than historical capacity

After the Valero Benicia and Phillips 66 refineries close, the crude oil intake capacity of remaining refineries with gasoline production will be 1,306,671 barrels per day.¹⁷ As **Figure 3** illustrates, existing marine terminal capacity and prior import levels are sufficient to manage this amount: as recently as July 2018, California's ports handled 1,351,742 barrels per day of marine imports (14% from Alaska; 86% from abroad) that were stored and piped to in-state refineries.¹⁸ In total, marine crude imports exceeded 1.3 million barrels per day in 6 of the past 96 months. In other words, as in-state crude oil production continues to decline over time, any shortfalls between refinery demand for crude oil and in-state supply can be met by historical levels of imports based on the state's existing port and port-related pipeline infrastructure.

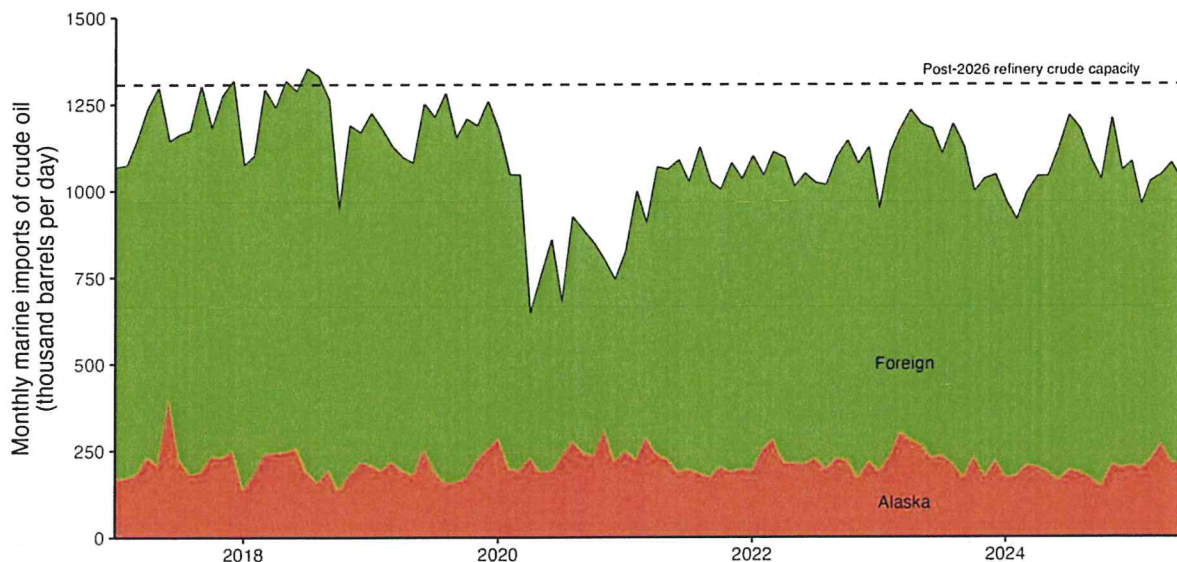


Figure 3. Average monthly marine imports of crude oil from Alaska and foreign sources, in thousands of barrels per day.

Author analysis based on California Energy Commission data. Post-2026 refinery crude oil intake capacity is plotted as a dotted line to reflect 1,306,671 barrel-per-day capacity from seven in-state refineries with capacity to produce CARBOB gasoline: Marathon Los Angeles, Chevron El Segundo, Chevron Richmond, PBF Energy Torrance, PBF Energy Martinez, Valero Wilmington, and Kern Energy Bakersfield. Marine imports data from California Energy Commission: <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/annual-oil-supply-sources-california-1>. Refining capacity data from California Energy Commission: <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/californias-oil-refineries>.

¹⁷ Slide 43, Joint Agency presentation to Assembly Committee on Utilities and Energy, May 28, 2025; https://autl.assembly.ca.gov/system/files/2025-05/agency-slides_asm_ue_oversight-hearing_petroileum_05-28-25.pdf. This number excludes 139,000 bpd from Phillips 66 and 145,000 bpd from Valero Energy Corp.

¹⁸ Based on data from California Energy Commission, <https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/annual-oil-supply-sources-california-1>

This is in contrast to claims by the Western Petroleum States Association that “we’re going to run into a port infrastructure problem and need to look at how to build out or accommodate those additional ships coming in.”¹⁹ CEC data shows that the state already has the port infrastructure to handle the level of imports to fully supply refinery needs going forward. This is in addition to the capacity to import refined products as noted in the prior section, such that **California’s ports and port-related pipelines have existing capacity to meet demand for both crude oil by refineries and gasoline by consumers.** However, as noted by the CEC, the state should continue to identify pathways to improve air quality in communities near ports, such as via upgrading port facilities through increased electrification.²⁰

¹⁹ August, 20, 2025, Joint Hearing: <https://www.assembly.ca.gov/media/joint-hearing-assembly-utilities-and-energy-committee-and-assembly-natural-resources-committee-and-assembly-transportation-committee-20250820> (at 04:14:22).

²⁰ Pages 19-20, California Energy Commission Vice Chair Gunda letter to Governor Newsom, June 27, 2025.

3. The continued decline of in-state oil production has clear health and climate benefits

Individuals living in oil-producing regions are exposed to numerous pollutants associated with oil and gas drilling, such as particulate matter, nitrogen dioxide, and ozone, which are linked to a range of health effects such as heart disease, aggravated asthma, diabetes, and premature death.²¹ One study finds that in 2017, over 600 premature deaths in California were directly attributed to pollution from oil and gas operations such as drilling, processing, and refining.²² A separate study estimated that phasing out onshore oil operations over a 20-year pathway would prevent \$1.5 billion in mortality-related health costs compared to a business-as-usual scenario of gradual production decline.²³

In addition to reducing health-related damages from oil and gas operations, declining oil production will result in significant climate-related benefits given the state's high levels of greenhouse gas emissions related to the production of oil and gas. The same study above estimates that, compared to a business-as-usual scenario, an aggressive phaseout of California's onshore oil production is predicted to reduce 100 million tonnes of CO₂e cumulatively through 2045.²⁴ This emission reduction is equivalent to removing 23 million gasoline-powered vehicles off the road over the same time period, which is roughly 75% of California's registered gasoline cars in 2023.²⁵

Largely because of the commercial age of California's oil fields—and the resulting decline in reservoir pressure that necessitates techniques such as steam injection and other enhanced oil recovery methods—more energy is needed to produce a typical barrel of oil in the state than elsewhere around the world.²⁶ As a result, each barrel produced in California emits a relatively high amount of greenhouse gases.

²¹ U.S. Environmental Protection Agency. Basic information about oil and natural gas air pollution standards. Last updated September 2024: <https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-operations/basic-information-about-oil-and-natural>

²² Vohra, Karn, Eloise A. Marais, Ploy Achakulwisut, Susan Anenberg, and Colin Harkins. (2025). The health burden and racial-ethnic disparities of air pollution from the major oil and gas lifecycle stages in the United States. *Science Advances* 11, no. 34: eadu2241.

²³ Deshmukh, Ranjit, Paige Weber, Olivier Deschenes, Danae Hernandez-Cortes, Tia Kordell, Ruiwen Lee, Christopher Malloy et al. (2023). Equitable low-carbon transition pathways for California's oil extraction. *Nature Energy* 8, no. 6: 597-609.

²⁴ Deshmukh et al. (2023), Under a baseline scenario with no change in 2020-level policies, cumulative greenhouse gas emissions from the operation of California's oil and gas fields is estimated to decline from roughly 250 million tons of CO₂e to roughly 150 million tons of CO₂e over the 2020-2045 period.

²⁵ Estimated using the U.S. EPA Greenhouse Gas Equivalencies Calculator: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>. Compared with data from the U.S. DOE on the number of registered gasoline-powered (less ethanol) vehicles in California at 31,191,900 in 2023: <https://afdc.energy.gov/states/CA>.

²⁶ Brandt, Adam R. (2011). Oil depletion and the energy efficiency of oil production: The case of California. *Sustainability* 3, no. 10: 1833-1854; Masnadi, Mohammad S., Hassan M. El-Houjeiri, Dominik Schunack, Yunpo Li, Jacob G. Englander, Alhassan Badahdah, Jean-Christophe Monfort et al. (2018). Global carbon intensity of crude oil production. *Science* 361, no. 6405: 851-853.

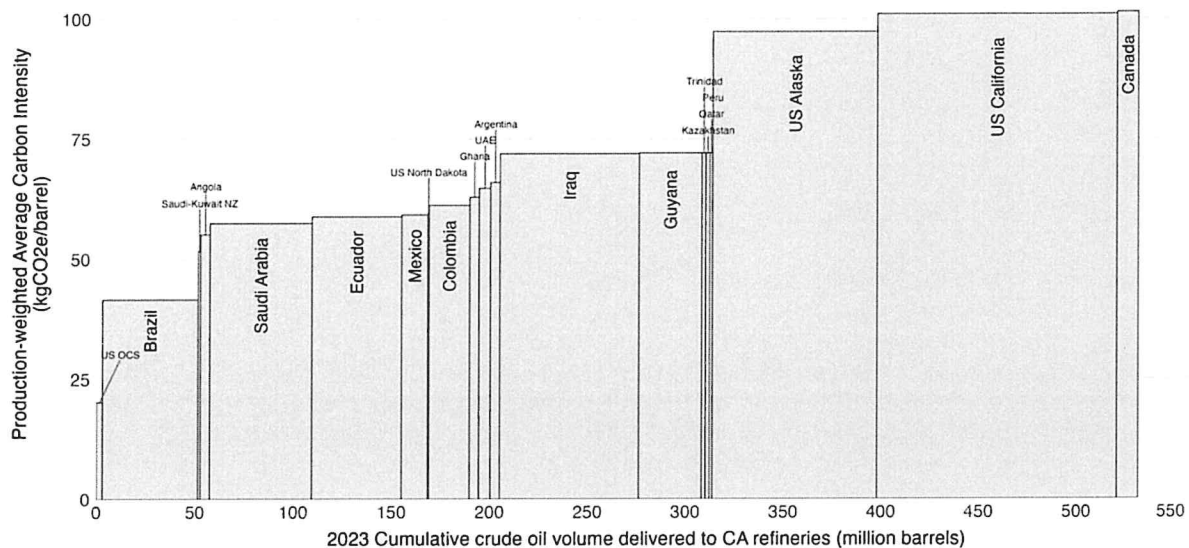


Figure 4. Carbon intensity of crude oil supplied to California refineries.

Author analysis based on California Air Resources Board data. Bars are arranged by production-weighted average carbon intensity, from lowest to highest, with box width denoting amount of crude oil supplied to California refineries in 2023. Carbon intensity values are drawn from the California Air Resources Board *2023 Low Carbon Fuel Standard – Crude Oil Life Cycle Assessment*: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/crude-oil/2023_Crude_Average_CI_Calculation_final.pdf. Carbon intensities are aggregated by country/state, using a production-weighted average based on 2023 volume of crude supplied to state refineries as reported to the California Department of Conservation (for California-based crudes), the Bureau of Safety and Environmental Enforcement (for federal offshore crudes), and the California Air Resources Board as part of annual Low Carbon Fuel Standard reporting (for imported crudes). Values are converted to kgCO₂e/barrel using a 6.119 conversion factor from BP, via Energy Intel: <https://www.energyintel.com/wcod-carbon-intensity-methodology>.

Based on data collected by the California Air Resources Board and visualized here in **Figure 4**, the average carbon intensity of in-state onshore production is higher than nearly all other barrels supplied to the state’s refineries, with the exception of crude oil imported from Canada’s oil sands.²⁷ Estimated intensities from out-of-state crude oil include emissions related to processing and shipping crude oil to the state, as the California Air Resources Board notes that its emissions intensity factors are “attributed to the production and transport of the crude oil supplied as petroleum feedstock to California refineries.”²⁸

²⁷ Data are drawn from California Air Resources Board *2023 Low Carbon Fuel Standard – Crude Oil Life Cycle Assessment*: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/crude-oil/2023_Crude_Average_CI_Calculation_final.pdf.

²⁸ Page 2, https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/crude-oil/2023_crude_average_ci_calculation_initial.pdf. For methodology details on CARB’s estimates of carbon intensity of crude oil, see https://ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf

Pathways forward amid refinery closures from declining demand

Faced with declining in-state demand over time, California's refineries will continue to face pressures to shut down production of gasoline that is produced specific to the state's markets. Some have proposed easing regulations on the blends of gasoline sold in the state, having refineries replace a portion of CARBOB production with conventional blends.²⁹ to minimize net environmental impacts, one proposal would have some retailers not selling CARBOB to contribute to a mitigation fund to support transitioning drivers of old gasoline-powered cars to electric vehicles.³⁰

While this option may alleviate some short-term pressures, refineries will ultimately consider closure or retrofitting given the long-term decline in demand. This presents a considerable challenge to communities that house refineries, which employ thousands of workers—many of whom are unionized and earn high wages and benefits.³¹ One study investigated the layoff of 345 unionized workers following the 2020 Marathon Martinez refinery retrofit, finding that while most (74%) workers found a new job, wages and benefits were not as competitive.³² In its letter to the Governor, the CEC recommended the state consider a “holistic transition strategy” that includes funding for workers impacted by the energy transition.³³ Further research is needed to identify effective strategies to minimize transition-related impacts on workers and communities.

Conclusion

Statewide efforts to prop up in-state oil production are not necessary and would lead to greater public health and climate change impacts. Statewide gasoline demand over the next six years will continue to be met by in-state refinery output and existing import levels, notwithstanding the planned refinery closures. In addition, the state's focus must continue to be on maintaining high standards on imported crude and petroleum products, including port upgrades where necessary, and redouble its efforts to manage the transition on impacted communities. This includes transition funding as recommended by the CEC, and targeted job search assistance for laid-off workers and their families, as well as evaluating challenges and value-creation strategies for asset retirement and remediation.³⁴

²⁹ Borenstein, Severin. (2025). California's Refinery Closure Drama. *Energy Institute Blog*, UC Berkeley, August 18: <https://energyathaas.wordpress.com/2025/08/18/californias-refinery-closure-drama>; Martin, Jeremy. (2025). What's Happening with California's Gasoline Supply? *The Equation*, Union of Concerned Scientists, June 27: <https://blog.ucs.org/jeremy-martin/whats-happening-with-californias-gasoline-supply/>

³⁰ Martin. (2025). What's Happening with California's Gasoline Supply?

³¹ BlueGreen Alliance Foundation. (2025). *Report and Recommendation of the Contra Costa Refinery Transition Partnership*: <https://www.bluegreenalliance.org/wp-content/uploads/2025/01/Contra-Costa-Refinery-Transition-Report-and-Recommendations-25.pdf>

³² Parks, Virginia, and Ian Baran. 2023. “Fossil fuel layoff: The economic and employment effects of a refinery closure on workers in the Bay Area.” Berkeley, CA: UC Berkeley Labor Center. <https://laborcenter.berkeley.edu/fossil-fuel-layoff/>.

³³ Page 22, California Energy Commission Vice Chair Gunda letter to Governor Newsom, June 27, 2025

³⁴ See pages 22-23, California Energy Commission Vice Chair Gunda letter to Governor Newsom, June 27, 2025