California State Assembly

UTILITIES AND ENERGY

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1:30 pm
1021 O Street, Room 1100

OVERSIGHT HEARING

Outlook for California's Transportation Fuels Sector

In September 2022, the Legislature passed AB 1279 (Muratsuchi, Chapter 337, Statutes of 2022) establishing a state policy to both achieve net zero greenhouse gas (GHG) emissions by 2045 and to ensure statewide anthropogenic GHGs are reduced to at least 85% below 1990 levels by 2045. In December 2022, the California Air Resources Board (CARB) released their updated 2022 Scoping Plan laying out a path to achieve these targets.[1] The Plan builds upon various legislative directives for each sector, including those specific to transportation fuels: SB 375 (Steinberg, Chapter 728, Statutes of 2008) which requires CARB to provide GHG reduction targets for the transportation sector for 2020 and 2035; and AB 197 (Eduardo Garcia, Chapter 250, Statutes of 2016) which requires CARB to prioritize direct emission reductions for specific sources, including transportation.

As part of the 2022 Plan, and in response to a 2021 directive by Governor Newsom to CARB to evaluate the phaseout of oil and gas extraction as part of the 2022 Plan,[2] CARB found an expected 94% decrease in liquid petroleum demand and 86% decrease in total fossil fuel demand in California by 2045 (relative to 2022 demand)[3] is needed to achieve air quality and climate goals. This is due to the transportation fossil fuel sector contributing approximately 11% of statewide GHG emissions, 23% criteria air pollutants, and 26% toxic air contaminants (in 2022),[4] with impacts borne most acutely in communities nearest to petroleum infrastructure. The anticipated reduction in demand is largely driven by Executive Order N-79-20,[5] signed by Governor Newsom in September 2020, which established transportation sector targets including:

[1] CARB; *2022 Scoping Plan for Achieving Carbon Neutrality;* December 2022; https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf
[2] Governor Newsom. April 23, 2021. Governor Newsom Takes Action to Phase Out Oil Extraction in California. Press Release. https://www.gov.ca.gov/2021/04/23/governor-newsom-takes-action-to-phaseout-oil-extraction-in-california/.
[3] See CARB's energy demand reduction scenarios tab on the spreadsheet here: https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-PATHWAYS-data-E3.xlsx
[4] Meng, et al; "Enhancing equity while eliminating emissions in California's supply of transportation fuels;" https://ww2.arb.ca.gov/sites/default/files/2021-06/ucsb_sp_kickoff_june2021_0.pdf
[5] https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf

- 100% of in-state sales of new passenger cars and trucks will be zero-emission by 2035.
- 100% of medium- and heavy-duty vehicles will be zero-emission by 2045 for all operations where feasible, and by 2035 for drayage trucks.
- 100% of off-road vehicles and equipment will be zero-emission by 2035 where feasible

However, critiques of the 2022 Scoping Plan noted a lack of a clear strategy for meeting 2030 goals;[6] and – crucially for this discussion – a specific need for a petroleum phaseout plan.[7] The petroleum industry is complicated, interconnected, and depends on extensive infrastructure (oil fields, marine terminals, refineries, pipelines, tankers) to operate. This infrastructure won't disappear, nor will it lose its functionality. Rather, the next two decades will mark what Professor Emily Grubert calls the "mid-transition" – a period where zero-carbon and fossil fuel systems "co-exist at scales where each imposes operationally relevant constraints on the other."[8] In writing about the mid-transition, Grubert notes "without explicit planning, the transition is likely to face major challenges like local economic busts, highly inequitable access to high quality energy and infrastructure systems, and poor coordination for system-level characteristics like reliability, accessibility, and affordability."[9]

In 2023, as part of SB X1-2 (Skinner, Chapter 1, Statutes of 2023) the Legislature commissioned two studies to evaluate the mid-transition: 1) a Transportation Fuels Assessment led by the California Energy Commission (CEC), due every three years starting in January 2024, to identify methods "to ensure a reliable supply of affordable and safe transportation fuels" in the state, among other considerations;[10] and 2) a Transportation Fuels Transition Plan led jointly by the CEC and CARB, due on December 31, 2024, to "identify mechanisms to plan for and monitor progress toward the state's reliable, safe, equitable, and affordable transition away from petroleum fuels in line with declining instate petroleum demand."[11] The distinction between these two documents seems to be that the Fuels Transition Plan will map how to decarbonize our transportation fuel sector, while the Fuels Assessment seeks to ensure the road is as smooth as possible. The CEC finalized their first Transportation Fuels Assessment in August 2024;[12] the CEC-CARB Transportation Fuels Transition Plan is delayed.

What is not delayed, and perhaps accelerated beyond recent expectations, is California's petroleum market response to the mid-transition. In 2020, the Marathon Martinez refinery converted to renewable diesel production with no crude refining capacity.[13] In 2024, the Phillips 66 Rodeo refinery ceased production of California specific gasoline and converted to renewable diesel. In October 2024, Phillips 66 announced a planned closure of its Wilmington refinery by

[6] Gabriel Petek; Legislative Analyst's Office, *The 2022 Scoping Plan Update*; January 2023; https://lao.ca.gov/reports/2023/4656/2022-Scoping-Plan-Update-010423.pdf
[7] Jeremy Martin, "California Needs a Petroleum Phaseout Plan;" *The Equation*; Union of Concerned Scientists Blog; August 24, 2022; https://blog.ucs.org/jeremy-martin/california-needs-a-petroleum-phaseout-plan/?_gl=1*8i470v*_gcl_au*MTkzNDI5OTY3Mi4xNzQzMzcyMTEy*_ga*MTc3NjY4MTc2Ny4xNzQzMzcyMTEz*_ga_VB9DKE4V36*czE3NDg0MjY5NzUkbzIkZzEkdDE3NDg0MjcyODMkajYwJGwwJGg1Njk2ODQ0MTA.
[8] Grubert and Hastings-Simon; "Designing the mid-transition: A review of medium-term challenges for coordinated decarbonization in the United States;" *WIREs Climate Change;* January 2022; e 768; https://emilygrubert.org/wp-content/uploads/2022/10/Grubert-and-Hastings-Simon-2022-Designing-the-mid-transition-A-review-of-medium-t.pdf
[9] Grubert and Hastings-Simon; *WIREs* 2022; *Ibid.*
[10] Public Resources Code §§ 25371-25371.2
[11] Public Resources Code § 25371.3
[12] CEC; *Transportation Fuels Assessment: Policy Options for a Reliable Supply of Affordable and Safe Transportation Fuels in California;* August 2024; https://efiling.energy.ca.gov/GetDocument.aspx?tn=258521&DocumentContentId=94552
[13] Ted Goldberg; "Shutdown of Marathon's Martinez Refinery Prompts Calls for 'Just Transition' for Oil Workers;" *KQED;* August 3, 2020. https://www.kqed.org/news/11831607/shutdown-of-marathons-martinez-refinery-prompts-calls-for-just-transition-for-oil-workers

year's end 2025.[14] And in April 2025, Valero announced the planned closure of its Benicia refinery by April 2026.[15] Earlier this month, that Valero Benicia refinery caught fire and remains offline;[16] while in February 2025, the PBF refinery in Martinez, CA, also caught fire and remains offline.[17] These conversions and closures are not unique to the state, as nationally consolidation and closures are occurring.[18] However, the immediate impact in California is the real potential for significant supply constraints, and likely price increases, in the very near-term.

The purpose of this hearing is to understand the various supply and demand pressures, many of which are rapidly changing, on California's transportation fuels sector, with specific focus on impacts to affordability and access. The discussion will center on how regulators and energy planners are preparing for the "mid-transition" in both the short- and mid-term. This hearing will provide an opportunity for oversight of agency implementation of both SB X1-2 (Skinner, Chapter 1, Statutes of 2023) and AB X2-1 (Hart, Chapter 1, Statutes of 2024).

Market Trends. California's transportation fuels market is currently dominated by gasoline and diesel, both with challenges that affect the stability of their pricing. Moreover, California's fuel market is in a period of transition.[19] Supply is tightening, as demand is declining. These trends are unlikely to subside. Rather, more volatility in the market is likely if the state does not strategize and appropriately plan for smoothing the transition. These challenges are exacerbated in California due to our specific fuels market structure and infrastructure limitations, which is examined more in the Appendix.[20]

Broadly speaking, California's petroleum production operates with little headroom: the state's refining capacity is comparable with its demand. As shown in Figure 1,[21] as of March 2024, nine refineries in the state produce the California-specific, California Reformulated Blendstocks for Oxygenate Blending (CARBOB) gasoline. Figure 1 shows the capacity of CARBOB generated by in-state gas refiners every year. The salmon bars are southern California refineries and the blue bars are northern California refineries. The purple line shows demand for CARBOB gas every year in the state. The figure only records demand until 2022 (the purple line) but it shows that the 2022 demand has met the projected supply in 2024 (the top of the blue box).

14 Philips 66 news release; "Phillips 66 provides notice of its plan to cease operations at Los Angeles-area refinery;" October 16, 2024; https://investor.phillips66.com/financial-information/news-releases/news-release-details/2024/Phillips-66-provides-notice-of-its-plan-to-cease-operations-at-Los-Angeles-area-refinery/default.aspx.

[15] Matthew Green; "Potential Valero Refinery Closure Leaves Benicia, State Officials Scrambling for Alternatives;" *KQED*; April 26, 2025; https://www.kqed.org/news/12037668/potential-valero-refinery-closure-leaves-benicia-state-officials-scrambling-to-pick-up-pieces

[16] NBC Bay Area staff; "Notices of violation issued to Valero after Benicia refinery fire;" *NBC Bay Area;* May 8, 2025; https://www.nbcbayarea.com/news/local/notices-of-violation-benicia-refinery-fire/3863776/

[17] Bay City News; "Over 7,000 gallons spilled during Martinez Refining Company fire last month, report says;" *ABC7*; March 5, 2025; https://abc7news.com/post/martinez-refining-company-says-7000-gallons-hydrocarbon-materials-released-during-february-fire-new-report/15980905/

[18] Such as LyondellBasell in Texas, Phillips 66 Alliance Refinery in Louisiana, and PBF Energy refinery in Paulsboro, New Jersey.

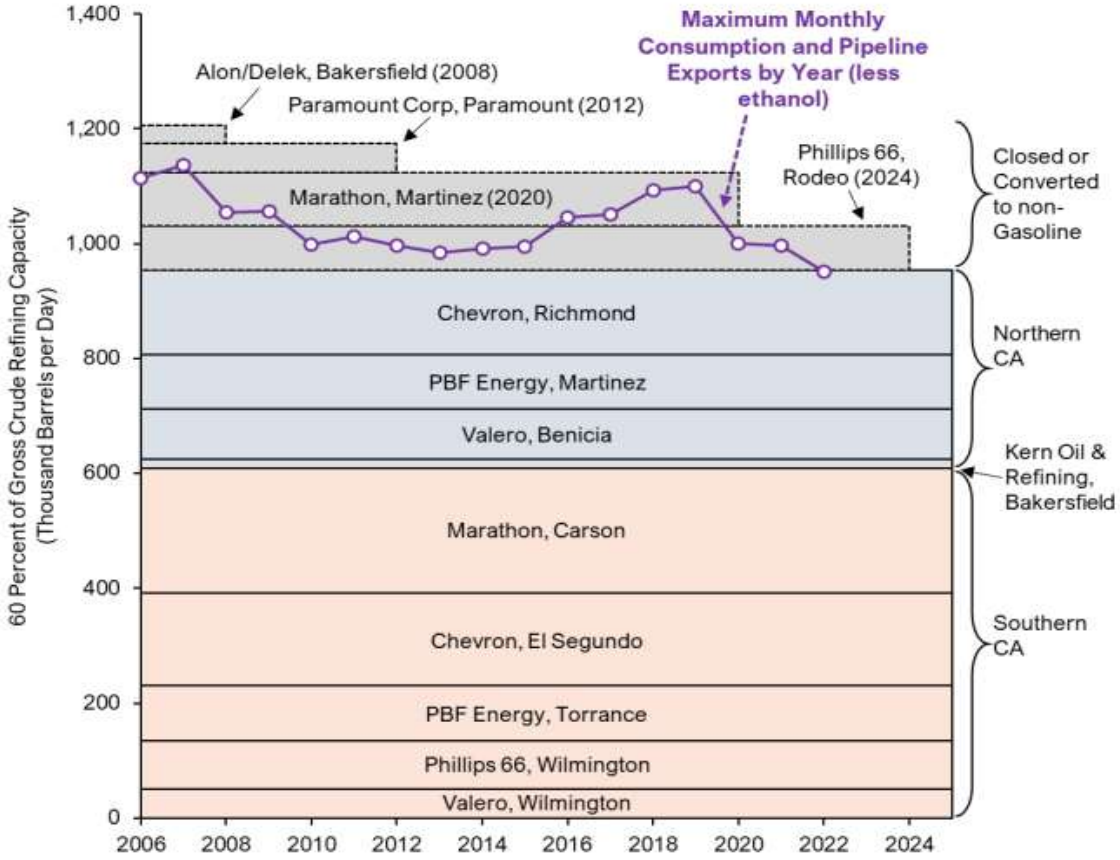
[19] See also informational hearings of this committee on September 18th and 19th, 2024, during the 2nd Extraordinary Session that discusses the state's transportation fuel market.

[20] See the background document and discussion prepared on September 18, 2024, "*California's Petroleum Economy: The Current Market and the Future Fuels Transition Plan*," for more detail on this market structure and its limitations.

[21] Figure ES-2, pg 2; CEC *Transportation Fuels Assessment*; August 2024 | CEC-200-2024-003-CMF; https://efiling.energy.ca.gov/GetDocument.aspx?tn=258521&DocumentContentId=94552

However, Figure 1 shows a 2022/2023 snapshot. Updating Figure 1 to today's reality will show further supply drops from the loss of Phillips 66's Wilmington refinery[22] and Valero's Benicia refinery.[23] Combined, these two refineries represent approximately 17% of the state's gasoline production, which is poised to disappear over a short period. According to CEC data, the maximum in-state monthly consumption by year (purple line) has remained relatively flat since 2022, meaning with the loss of these two refineries by mid-2026, in-state demand will exceed supply.

Figure 1 – Peak CARBOB Gasoline Refinery Capacity (approximate) Overlaid with Maximum Monthly Consumption (purple line), with northern California (blue bars), southern California (salmon bars), and closed or converted (grey bars) refineries identified.



The more widespread impact will be on California (and the region's[24]) transportation fuel supply, especially for gasoline. While gasoline demand in the state is expected to continue declining – due to increasing fuel economy and growing electric vehicle adoption – the step-loss in supply associated with these closure would create significant near-term disruption. Higher prices of gasoline can have crippling effects for residents on fixed or limited incomes, especially those who rely on long commutes to get to work. Higher gasoline prices also take a toll on the overall

[22] Philips 66 news release; "Phillips 66 provides notice of its plan to cease operations at Los Angeles-area refinery;" October 16, 2024; https://investor.phillips66.com/financial-information/news-releases/news-release-details/2024/Phillips-66-provides-notice-of-its-plan-to-cease-operations-at-Los-Angeles-area-refinery/default.aspx.
[23] Matthew Green; "Potential Valero Refinery Closure Leaves Benicia, State Officials Scrambling for Alternatives;" *KQED*; April 26, 2025; https://www.kqed.org/news/12037668/potential-valero-refinery-closure-leaves-benicia-state-officials-scrambling-to-pick-up-pieces
[24] PADD 5 https://www.eia.gov/todayinenergy/detail.php?id=4890

economy, impacting goods that use gasoline fuels to get to market. While Californians pay among the highest retail prices for gasoline, California ranks twenty-first in the country for per capita spending on motor vehicle fuel, a result of California's low fuel consumption.[25] This low average consumption means those populations especially dependent on driving as part of their job or by necessity will be especially vulnerable to price spikes.

An additional concern to decreased supply is the regional nature of the California refineries. Except for one small refinery in central California (Kern Oil), nearly all instate supply will come from two refineries in northern California (blue bars) and four refineries in southern California (salmon bars). These regions are not connected via pipeline; thus, any temporary reduction of refining capacity at a single refinery in either the north or the south would represent a critical reduction for each respective region.[26]

Need for State Planning. This trend of thinner margins between supply and demand may come to dominate the landscape of California petroleum operations in the decades to come. As a result, absent intervention, pricing volatility may be a likely consequence. Moments where a mismatch between supply and demand are likely to occur – such as the current forecast for 2026 – should be closely evaluated in order to develop potential mitigation or buffering strategies. These "pinch points" can fit into three categories:

1) Easily manageable and foreseeable – such as turnaround events at refineries that are planned years in advance.
2) More costly to manage, but foreseeable events or policies – such as planned refinery closures or consolidations, shipping constraints,[27] or changing state policies.[28]
3) Difficult to manage and to foresee – such as catastrophic events resulting in unplanned outages (such as the power loss at Benicia in 2017[29] or the fire at PBF Martinez this February) or geopolitical developments (such as the Russia-Ukraine war or the COVID pandemic).

None of this should be surprising. In its 2022 Scoping Plan, CARB noted "to achieve California's air quality and climate goals, we must end our dependence on petroleum."[30] The Plan then assumes phasedowns in both oil and gas extraction as well as petroleum refining in line with the anticipated reduction in finished petroleum demand. However, the suggestion that supply phasedowns will occur "in line with" demand does not adequately capture the step-wise nature of refinery closures in the state. The market will resolve, and has resolved, demand and supply mismatches, but not always in the smoothest manner nor with consumer interest at the forefront. Thus it is imperative the Legislature and state agencies identify solutions and contingencies for these pinch points that are inclusive of all levels of impact. CARB noted in the 2022 Plan "an assessment of ongoing progress and efforts to reduce demand for petroleum fuels and of opportunities to phase down oil and gas extraction and refining will be included in the

[25] Despite the state's car-centric reputation. Pg. 1; Droboniku, Gentian, et al., 2024. *2024 Review of the Price of Gasoline in California and Related Impact on State Revenues.* CEC and CDTFA. Pub #: CEC-200-2024-007.
[26] Though, the CEC notes, waterborne transportation is available; though presumably subject to Jones Act shipping limitations and not often utilized as a viable option.
[27] like the federal Jones Act which places strict requirements on the vessels that may be used between US ports
[28] such as permitting limitations for new port berths or tankage, or emission-reduction strategies like CARB's ocean-going vessels regulation
[29] Ted Goldberg, "CPUC Probe Says PG&E Mistakes Led to Benicia Refinery Outage," *KQED*, July 19, 2018. https://www.kqed.org/news/11681218/cpuc-probe-says-pge-mistakes-led-to-benicia-refinery-outage
[30] Pg. 100, CARB, *2022 Scoping Plan for Achieving Carbon Neutrality*, December 2022.

next Scoping Plan update."[31] However, that update isn't due until 2027; planning for the mid-transition needs to happen immediately.

These pinch points highlight the difficulty state agencies, local communities, the industry, and its workforce face in developing solutions that 1) help smooth the decarbonization transition; 2) protect consumers and keep costs low; 3) maintain the workforce; and 4) ensure the health and safety of both the workforce and the public. One of the requirements under SB X1-2 (Skinner, Chapter 1, Statutes of 2023) was a report – the CEC's Transportation Fuels Assessment – that the CEC must submit every three years to identify methods to ensure a reliable supply of affordable and safe transportation fuels in California. The Assessment shall evaluate the price of transportation fuels, and consider market demand at regular intervals, out to 20 years. It shall also include an analysis of refinery maintenance operations, and evaluate ways to manage necessary maintenance among the various facilities.[32]

In August 2024, the CEC submitted their Fuels Assessment.[33] The final chapter, "Policy Options to Mitigate Price Spikes," offered a discussion of potential ideas to help stabilize, or mitigate impacts to, California's fuel market with a focus on keeping fuel accessible and affordable. The ideas ranged from targeting supply or demand to ideas that would be substantially more difficult to implement. These include, media alerts of potential fuel shortages to move consumers to conserve; setting up a strategic reserve; allowing increased blending of ethanol into CARBOB; creating a fee-based non-CARBOB allowance program; or state ownership of a Jones Act tanker[34] to provide "stand-by" support to move fuel between domestic ports.[35]

However the CEC's Transportation Fuels Assessment was limited to addressing supply shortfalls and mitigating fuel prices. While a serious concern, the potential closure of refinery operations creates challenges and consequences that reach far beyond fuel prices and availability to include local impacts to lost tax revenues and jobs; uncertainty with unfunded obligations such as worker pensions, remediation commitments, and future maintenance and monitoring of the site that will have financial implications at the local, regional, and state level; and overall loss of system resilience. These broader economic and societal impacts must also be considered and planned for during the mid-transition to minimize the impact on already-impacted communities. The forthcoming CARB-CEC Transportation Fuels Transition Plan could provide the opportunity and mechanism to evaluate and – crucially – plan for these broader impacts and unintended consequences.

Case Study: Planned Valero Benicia Closure. On Tuesday, April 15, 2025, Valero Energy submitted notice to the CEC of its intent to idle, restructure, or cease refining operations at Valero's Benicia Refinery by the end of April 2026.[36] In addition to the notice regarding Benicia, Valero filed a form 8-K with the U.S. Securities and Exchange Commission stating that it

[31] 2022 Scoping Plan, pg. 101
[32] Public Resources Code §§ 25371-25371.1
[33] CEC, *Transportation Fuels Assessment,* August 2024; CEC-200-2024-003-CMF. https://efiling.energy.ca.gov/GetDocument.aspx?tn=258521&DocumentContentId=94552
[34] The Jones Act requires that any cargo traveling by sea between two U.S. ports must be built in the U.S. and be crewed by mostly U.S. citizens.
[35] See the tables on pgs. 57-76 of the Transportation Fuels Assessment for the exhaustive list of ideas*;* CEC, *Transportation Fuels Assessment,* August 2024; CEC-200-2024-003-CMF. https://efiling.energy.ca.gov/GetDocument.aspx?tn=258521&DocumentContentId=94552
[36] Business Wire; "Valero Announces Notice to the California Energy Commission Regarding its Benicia, California, Refinery;" April 16, 2025; https://www.businesswire.com/news/home/20250415977846/en/Valero-Announces-Notice-to-the-California-Energy-Commission-Regarding-its-Benicia-California-Refinery

"continues to evaluate strategic alternatives for its remaining operations in California."[37] Benicia's refinery produces about 9% of California's gasoline[38] and employs roughly 400 workers.[39] In addition, the facility uses contractors and service providers to support its operations, making it a cornerstone of both the local economy and the state's fuel supply. The loss of this facility means significant revenue loss for the city, hundreds of jobs at risk, and a potential increase in fuel prices for consumers statewide.

A more unique role of the Valero Benicia refinery is its relationship to Travis Air Force Base (AFB). The Valero Benicia refinery is the exclusive supplier of jet fuel to Travis AFB, delivering fuel through a direct pipeline. This arrangement is crucial for the base's operations, as Travis AFB consumes a substantial amount of fuel to support its air missions. The potential closure of the refinery raises concerns about the base's fuel supply, as replacing this source within a year poses significant logistical challenges.[40]

In October 2024, Valero was fined approximately $82 million by state and regional air quality agencies for significant air pollution violations at its Benicia refinery.[41] In addition to the penalty, Valero committed to actions to eliminate emissions from the refinery's main hydrogen vent, and implement other abatements. In May 2025, a fire broke out at the refinery, prompting emergency response and raising further concerns about the facility's safety and reliability.[42] The status of the penalty payments or mitigations in light of the potential closure is unknown. In its SEC filing, Valero recorded expected asset retirement obligations of $337 million;[43] whether such a sum is sufficient to cover the unfunded obligations of the refinery is also unknown.

Recent Legislative Tools. As part of two recent extraordinary sessions, the Legislature adopted a suite of tools in SB X1-2 (Skinner, Chapter 1, Statutes of 2023) and AB X2-1 (Hart, Chapter 1, Statutes of 2024). SB X1-2 incorporates several policies to address gasoline supply and pricing, including the authority for the CEC to establish a maximum gross refining margin and penalty, enhanced reporting requirements across the entire transportation fuels sector, and the creation of a new Division of Petroleum Market Oversight. AB X2-1 authorizes the CEC, if necessary and justified, to increase transportation fuel supply through various actions; principally, by authorizing the CEC to develop requirements on refiners to maintain resupply plans to cover production loss during maintenance events, and to maintain minimum levels of inventories.

Today, the main value of these efforts has been the enhanced reporting allowing for better transparency into industry activities and impacts. SB X1-2 also required notice from refinery operators at least 12 months in advance of any plans to permanently shut down, shut down to reconfigure, or to sell a refinery;[44] such notice has likely aided efforts to help manage the planned shutdown in Benicia.

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[37] https://www.streetinsider.com/SEC+Filings/Form++8-K++++++++VALERO+ENERGY+CORPTX+++++For%3A+Apr+16/24645776.html
[38] https://abc7news.com/post/valero-benicia-refinery-experts-say-possible-closure-could-raise-gas-prices-state-intervention/16189106/
[39] https://abc7news.com/post/valero-refinery-benicia-close-april-2026-companies-face-increased-oversight-california/16185632/
[40] Matthew Green; "Potential Valero Refinery Closure Leaves Benicia, State Officials Scrambling for Alternatives;" *KQED*; April 26, 2025; https://www.kqed.org/news/12037668/potential-valero-refinery-closure-leaves-benicia-state-officials-scrambling-to-pick-up-pieces
[41] CARB; "Valero Refining Company – California Settles for $81, 962,602;" https://ww2.arb.ca.gov/valero-refining-company-california-settlement ***and*** https://ww2.arb.ca.gov/sites/default/files/2024-10/valero_refining_company_california_sa.pdf
[42] NBC Bay Area staff; "Notices of violation issued to Valero after Benicia refinery fire;" *NBC Bay Area;* May 8, 2025; https://www.nbcbayarea.com/news/local/notices-of-violation-benicia-refinery-fire/3863776/
[43] Valero investor announcement; April 16, 2025; https://investorvalero.com/news/news-details/2025/Valero-Announces-Notice-to-the-California-Energy-Commission-Regarding-its-Benicia-California-Refinery/default.aspx
[44] Public Resources Code § 25354 (p)

Other tools are less clear. The CEC to date has not established a maximum gross refining margin and penalty, nor has it determined whether "the likely benefits [of setting the max margin and penalty] to consumers outweigh the potential costs to consumers" as mandated by statue. The CEC has three criteria it must consider, at minimum, in such an evaluation:

a) Whether it is likely that the max margin and penalty will lead to a greater imbalance between supply and demand in the California transportation fuels market than would exist without the max margin and penalty.

b) Whether it is likely that the max margin and penalty will lead to higher average prices at the pump on an annual basis than would exist without the max margin and penalty.

c) Whether case-by-case exemptions from the max margin will be sufficient to ensure that individual refiners have an opportunity to demonstrate the need for a greater margin before they make decisions about production.

The CEC has begun implementation of AB X2-1, providing a draft framework of refinery resupply regulations in February 2025.[45] The main focus of the draft framework was on resupply planning for refiners undergoing planned maintenance, and primarily sought voluntary participation from refineries. The status of further AB X2-1 implementation following the announcement of Valero Benicia's planned closure is unknown.

On April 21, 2025, following the Valero announcement, Governor Newsom sent a letter to CEC Vice Chair Gunda directing him "to redouble the State's efforts to work closely with refiners on short- and long-term planning…to ensure that Californians continue to have access to a safe, affordable, and reliable supply of transportation fuels, and that refiners continue to see the value in serving the California market."[46] The letter also announced a Petroleum Strategy Task Force, convened by California Natural Resources Agency Secretary Wade Crowfoot and California Environmental Protection Agency Secretary Yana Garcia in order to evaluate the State's progress and risks in managing an energy transition; and asked Vice Chair Gunda to "recommend, by July 1, any changes in the State's approach [to the fuel transition] that are needed to ensure adequate supply during this transition." The status of those recommendations – and what would be for the Legislature to act upon versus state agencies – is currently unknown to this committee.

Conclusions. California has been signaling a phased decline of the oil and gasoline sector for many years. The state has unique fuel specifications, ambitious environmental standards, and challenging permitting rules. Even so, according to Stillwater Associates, historic margins in California have been mostly positive.[47] These have resulted in major companies changing operations in the state over the past two decades, but those refinery sales did not reduce refinery capacity in aggregate. (Exxon sold the Benicia refinery to Valero; BP sold its Carson refinery to Tesoro; Shell sold its Wilmington refinery to Tesoro and its Martinez refinery to PBF; ExxonMobil sold its Torrance refinery to PBF).In the past decade, however, Stillwater notes the costs to operate a refinery and supply petroleum-based fuels have risen. The more recently announced shutdowns and planned conversions are occurring rapidly, and are anticipated to

[45] CEC draft staff report; "Draft Framework of Refinery Resupply Regulations;" February 2025; https://efiling.energy.ca.gov/GetDocument.aspx?tn=262095&DocumentContentId=98606

[46] https://www.gov.ca.gov/wp-content/uploads/2025/05/Newsom-Gupta-Letter-4.21.pdf

[47] Stillwater Associates; "Benicia Blues: Valero's shutdown Signals Trouble for California Gas;" April 22, 2025; https://stillwaterassociates.com/benicia-blues-valeros-shutdown-signals-trouble-for-california-gas/

impact refinery capacity before any anticipated gasoline displacement has been realized via EV adoption or other fuel reduction strategies.

These changes are likely to cause real consequences at the local, state, and regional level. Creating a unified approach that addresses immediate needs to meet current demand, and adopting a system-wide strategy to ensure a stable market in the mid-transition will be critical priorities over the next year. These strategies should occur in consultation with impacted communities and workforce, many of which have already been engaging in local or regional planning to manage their own impacts.

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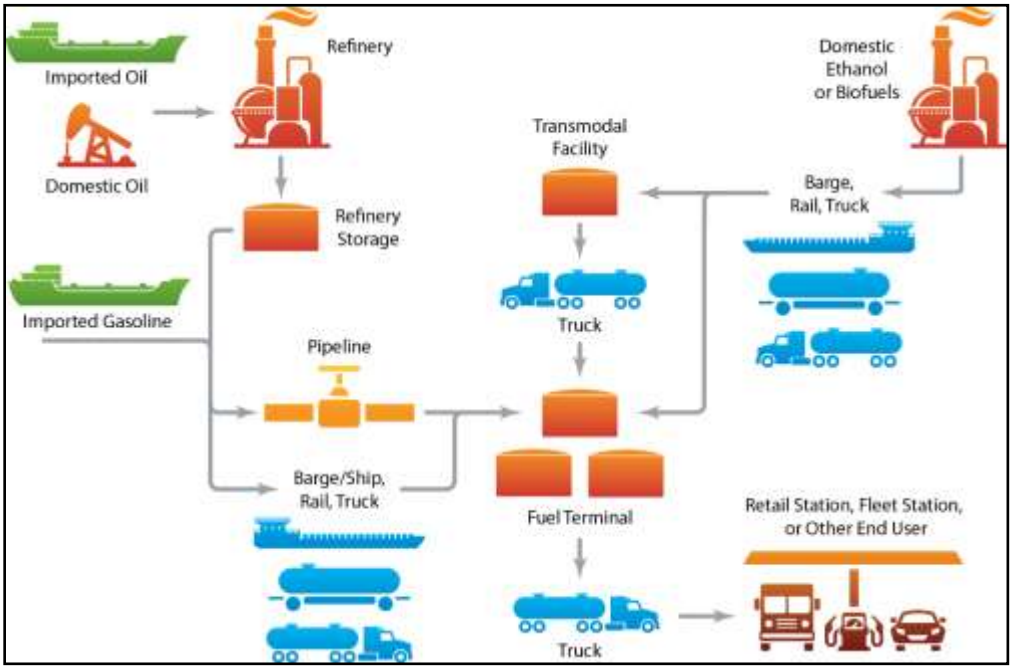
Appendix – Oil Market design and dynamics

For a more comprehensive overview, see Chapter 2: Petroleum Basics in the CEC's 2024 Transportation Fuels Assessment.[48]

A Production Overview. Gasoline begins its journey to consumers as crude oil at petroleum refineries and then moves through stages of refining, transport, storage, and blending until final delivery to retail fueling stations. The inputs into the system could be imported or domestic crude; or, when refinery operations are down, imported finished gasoline. The refined or imported product then travels along various transit – pipeline, barge, ship, rail or truck – before reaching fuel terminals and eventually the end consumer, as depicted in Figure A-1 below.

Figure A-2 - Well to Wheel production, refining, and distribution of gasoline.[49]



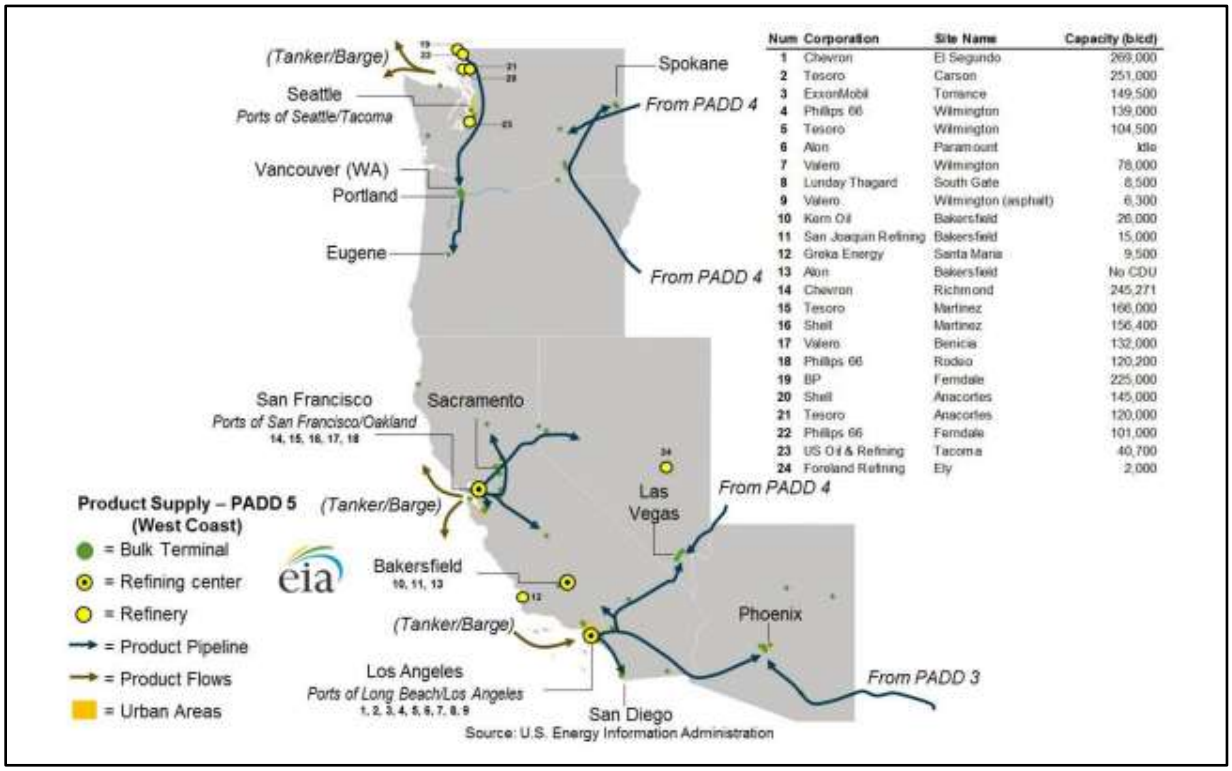
Origin of California's Crude Oil. Crude oil is the raw material that is refined into various transportation fuels – from gasoline, diesel, and jet fuel – as well as residual products. More than two-thirds of the crude oil processed in California's refineries comes from out of state, with 59% sourced from outside of the U.S.[50] Fluctuations in the cost of crude oil make California's gasoline prices vulnerable to global disruptions, including supply chains or geopolitical instability. Russia's invasion of Ukraine has recently caused crude oil prices to increase and remain volatile. Gasoline prices are highly sensitive, so any shift in supply and demand changes what you pay at the pump. Crude oil production in California has decreased in recent decades from a peak of 402.23 million barrels in 1986 (accounting for 59.4% of California's refining output) to 135.15 million barrels in 2022 (25.9% of refining output), leading to increased

[48] Pg. 31; CEC; *Transportation Fuels Assessment: Policy Options for a Reliable Supply of Affordable and Safe Transportation Fuels in California;* August 2024; https://efiling.energy.ca.gov/GetDocument.aspx?tn=258521&DocumentContentId=94552
[49] Dean Armstrong, National Renewable Energy Laboratory
[50] CEC; "Oil Supply Sources To California Refineries"; https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/oil-supply-sources-california-refineries

dependence on crude oil imports from around the globe. Three countries (Ecuador, Saudi Arabia, and Iraq) accounted for approximately 50% of California's crude oil imports in 2021.[51]

Refining Crude Oil into Gasoline. California currently has 9 refineries that refine crude oil into gasoline fuel;[52] the majority are located in and around the South Bay region in the Los Angeles Basin, some in the East Bay region of the Bay Area, and the smallest by volume produced is located in Bakersfield. These refiners produce transportation fuels, including the specially formulated gasoline that meets California's air quality standards, known as California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB) gasoline. The CARBOB specifications are unique to California; therefore, gasoline used in neighboring states generally does not meet CARBOB specification and cannot be used as a substitute source of our supply. The state's refineries process over 1.6 million barrels of crude oil per day for use in California (88%) or export (to other states as well as internationally, 12% combined). In 2021, California was the seventh-largest producer of crude oil among the 50 states, third-largest in crude oil refining capacity,[53] and the second-largest consumer of motor gasoline.[54] In addition to being isolated through the exclusive use of CARBOB, California's gasoline fuels market is geographically isolated from other locations in the U.S. that produce refined fuel products, as shown in Figure A-2.

Figure A-3 - Western Refineries and Product Flows (in 2015).[55] *Note: as of 2024, seven of the listed California refineries do not produce CARBOB gasoline, while two have since combined with other facilities, leading to the 9 total refineries often referenced.*[56]



Num	Corporation	Site Name	Capacity (b/cd)
1	Chevron	El Segundo	269,000
2	Tesoro	Carson	251,000
3	ExxonMobil	Torrance	149,500
4	Phillips 66	Wilmington	139,000
5	Tesoro	Wilmington	104,500
6	Alon	Paramount	Idle
7	Valero	Wilmington	78,000
8	Lunday Thagard	South Gate	8,500
9	Valero	Wilmington (asphalt)	6,300
10	Kern Oil	Bakersfield	26,000
11	San Joaquin Refining	Bakersfield	15,000
12	Greka Energy	Santa Maria	9,500
13	Alon	Bakersfield	No CDU
14	Chevron	Richmond	245,271
15	Tesoro	Martinez	166,000
16	Shell	Martinez	156,400
17	Valero	Benicia	132,000
18	Phillips 66	Rodeo	120,200
19	BP	Ferndale	225,000
20	Shell	Anacortes	145,000
21	Tesoro	Anacortes	120,000
22	Phillips 66	Ferndale	101,000
23	US Oil & Refining	Tacoma	40,700
24	Foreland Refining	Ely	2,000

[51] CEC; "Foreign Sources of Crude Oil Imports to California 2021"; https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/foreign-sources-crude-oil-imports-2
[52] As of March 2024; pg. 2; 2024 *Transportation Fuels Assessment, Ibid.*
[53] as of January 2021
[54] U.S. Energy Information Administration; "California State Energy Profile"; https://www.eia.gov/state/print.php?sid=CA
[55] U.S. Energy Information Administration, *West Coast Transportation Fuels Markets*, September 2015; https://www.eia.gov/analysis/transportationfuels/padd5/pdf/transportation_fuels.pdf
[56] https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/californias-oil-refineries

The relatively small number of California refineries makes our system vulnerable to unexpected disruptions. As shown in Figure A-2, California's oil refineries and fuel distribution centers are isolated by time and distance from resupply sources. There are no pipelines that ship finished gasoline products *into* California. While there are pipelines that connect California to other adjacent states, these pipelines only ship gasoline products *out* of California. As a result, refinery outages can more dramatically impact our supply and pricing. This was the case after the unexpected outage in February 2015 at the then-Exxon Mobil Torrance Refinery which was due to an explosion of the facility. The extended shutdown of the Torrance refinery, in combination with an earlier shutdown at the Tesoro Golden Eagle refinery, took 17.5% of California oil processing capacity offline, severely constraining gasoline supply. Gasoline prices were immediately affected, jumping substantially within days of the explosion and subsequent shutdown.[57] The gross profits of California's refineries rose in the first six months of 2015 to $0.88 per gallon of gasoline, relative to the 15-year average of $0.49 per gallon.[58]

Because the state's refined gasoline market is nearly self-sufficient (imported gasoline and blending components account for only 3% to 7% of supply), supplies of gasoline and diesel fuel from outside the state are not routinely needed to balance supply with demand.[59] When unexpected supply disruptions occur, it can be difficult to find immediate alternative sources of supply due to California's stringent CARBOB specifications and relative geographic isolation. The market frequently turns to imports brought in by ship to make up shortfalls, however, those can take 3 to 4 weeks to arrive in California.

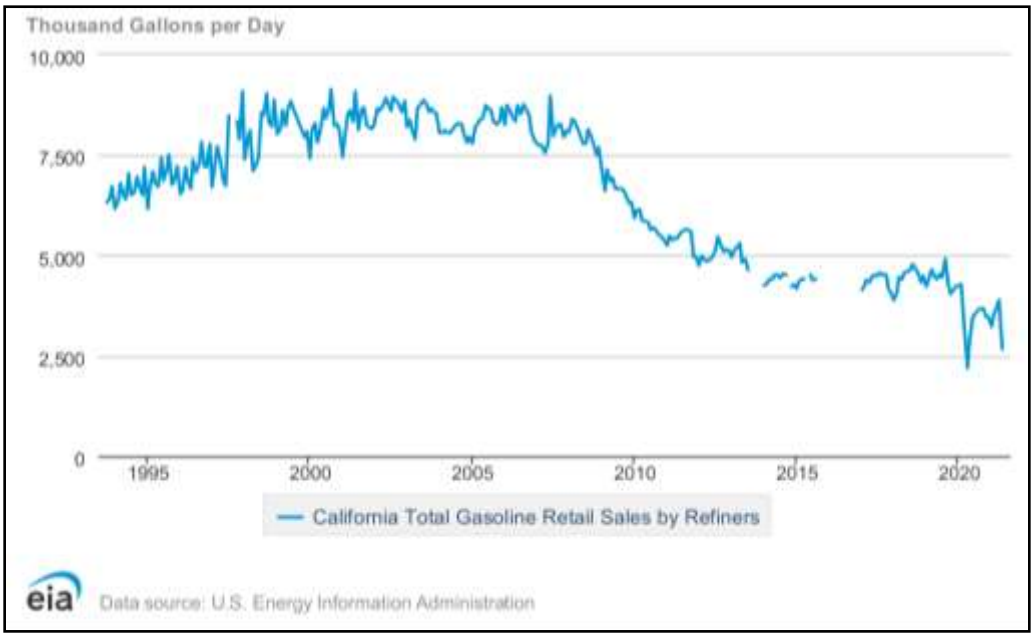
Refining Going Forward. The bottleneck effect of the small number of California refineries adding vulnerability to our gasoline market remains concerning, particularly in the context of the increased adoption of electric vehicles and California's stated goal of phasing out gasoline vehicles by 2035.[60,61] These trends are expected to shrink the gasoline market, with a range of potential outcomes to the refining industry. As shown in Figure A-3, California retail sales of gasoline have been declining over the last decade.

This declining demand may lead refineries to transition to refining renewable fuels, as was the case with the Marathon Martinez refinery in 2020 [62] and more recently with Phillips 66 Rodeo in 2024, which converted from producing gasoline to refining renewable diesel.[63] However, the extent of this transition across the industry may be limited by the supply of suitable feedstocks to produce renewable fuels. The anticipated reduction in the California gasoline market may also lead refiners to change their business practices, potentially foregoing production upgrades or cutting costs where possible at the expense of production, similar to a driver that delays

[57] Los Angeles Times; "Gas prices jump after Torrance refinery explosion"; February 2015; https://www.latimes.com/local/lanow/la-me-ln-portion-of-refinery-ordered-to-shut-down-20150219-story.html
[58] Los Angeles Times; "California oil refineries' gross profits nearly double in 2015"; July 2015; https://www.latimes.com/business/la-fi-gas-profits-20150722-story.html
[59] CEC; "What Drives California's Gasoline Prices?"; https://www.energy.ca.gov/data-reports/energy-insights/what-drives-californias-gasoline-prices
[60] Los Angeles Times; "Editorial: California electric car sales are zooming. Too bad they're mostly Teslas"; January 2023; https://www.latimes.com/opinion/story/2023-01-29/electric-vehicle-sales-tesla-equity#:~:text=They%20show%20that%2018.8%25%20of,sales%20in%20just%20two%20years.
[61] CARB; "California moves to accelerate to 100% new zero-emission vehicle sales by 2035"; August 2022; https://ww2.arb.ca.gov/news/california-moves-accelerate-100-new-zero-emission-vehicle-sales-2035
[62] Reuters; "Marathon partners with Neste on Martinez renewable fuels project"; March 2022; https://www.reuters.com/business/sustainable-business/marathon-petroleum-partners-with-neste-martinez-renewable-fuels-project-2022-03-01/
[63] Pg. 14, 2024 *Transportation Fuels Assessment, Ibid*

maintenance on an older car in anticipation of replacing the car entirely in the near future.[64] The most extreme response would be for some refineries, in the face of an evaporating market, to shutter altogether, though the profitability of the California fuels market suggests that is unlikely in the short-term.

Figure A-4 - California Total Gasoline Retail Sales by Refiners (1993-2022).[65] *Note: Total sales to end users includes sales through retail outlets as well as all direct sales to end users that were not made through company-operated retail outlets, e.g., sales to agricultural customers, commercial sales, and industrial sales.*



Distribution and Retail Sales. After it is refined, base gasoline is distributed via pipelines, ships, and barges to distribution terminals located in and around major metropolitan areas. Distribution terminals have large storage tanks that hold gasoline, with each tank containing base fuels from many different refineries and oil companies, meaning all gasoline in the tank is the same at this point. Gasoline is delivered to service stations by tanker trucks that can hold up to 10,000 gallons of fuel. When the tanker truck is filled at the distribution terminal, a specific fuel additive package may blend with the base gasoline, changing the generic base gasoline into a branded product, though whether branded gasoline constitutes a functionally different product has been questioned by the CEC.[66,67,68] The branded wholesale gasoline price is based on the average statewide branded refined "rack" price: the price paid at the point where tanker trucks load their fuel from a distribution terminal's loading rack.[69] Most branded franchise retailers purchase

[64] CalMatters; "Who's to blame for California's high gas prices?"; October 2022; https://calmatters.org/commentary/2022/10/whos-to-blame-for-californias-high-gas-prices/
[65] U.S. Energy Information Administration, data release date June 1, 2022. https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=A103650061&f=M
[66] AAA; "Where Does Gasoline Come From"; https://www.aaa.com/autorepair/articles/where-does-gasoline-come-from
[67] Branded and unbranded gasoline: branded gasoline refers to fuel that is sold under a brand name (such as BP, Shell, Exxon, Chevron, and Valero), and will include proprietary fuel additives. Unbranded gasoline is typically sold by single-station retail outlets, small chain retailers, and supermarkets chain stores (such as Costco and Safeway). CEC; "Estimated Gasoline Price Breakdown and Margins"; https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/estimated-gasoline-price-breakdown-and-margins
[68] CEC; "Additional Analysis on Gasoline Prices in California"; October 2019; https://www.energy.ca.gov/sites/default/files/2019-11/Gas_Price_Report.pdf
[69] CEC; "Estimated Gasoline Price Breakdown and Margins"; https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/estimated-gasoline-price-breakdown-and-margins

gasoline at a delivered price called the "dealer tank wagon" price that is typically higher than the branded rack price. The gasoline is then delivered to fueling stations throughout California for retail sale.

Retailers selling branded gasoline are contractually obligated to purchase from the branded supplier, giving the branded refiner leverage to charge a higher price for gasoline that will likely be passed on to consumers.[70] Alternatively, if a retailer signs a branded contract that locks in a long-term low price for wholesale gasoline, the retailer may still be incentivized to raise their retail price if the overall average retail price of gasoline rises, increasing their profit margin without risk of losing sales to lower-priced competitors. This restriction to a single brand of wholesale gasoline may introduce artificial scarcity into the market. The system of contracts between gasoline distributors and retailers is complex and highly varied in contract terms and duration, which poses a significant barrier to regulators investigating the impact of the distributor-retailer interface on retail gasoline prices.

Distribution and retail margin, which includes distribution costs, marketing costs, and profits, is an analogous metric to refining margin. It is calculated by subtracting the wholesale gasoline price and taxes from the weekly average retail sales price. Retailers are responsible for covering the costs associated with running many businesses, including rents, wages, utility rates, and equipment maintenance, as well as costs more unique to the retail gasoline sector, including CARB-mandated equipment upgrades, environmental fees, and permitting fees. The average annual distribution and retail margin in California has been above the U.S. average every year since 2011, which may reflect higher operating costs in California as well as any additional profit being collected.[71] At the end of the day, the retailers set the price at the pump, and retailers selling a well-regarded brand of gasoline or those operating fueling stations with prime locations may be incentivized to set high prices.[72]

Playing the Spot Market. Market participants buy and sell gasoline for physical delivery within a short time frame on "spot markets." These spot markets transactions are referred to as "physical" trades because market participants use them to obtain supplies of actual product. As a result, physical markets are located at or near refinery hubs and the trades consummated on the spot market designate a delivery location and delivery timeframe. Refiners sell gasoline to distributors at a price set by the spot market: an exchange controlled by the five oil refiners that account for 98% of California's gasoline supply, along with a small group of traders. California's gasoline spot market is remarkably opaque. There is no public ledger of trades on the gasoline spot market, only voluntary reports to the Oil Price Information Service (OPIS), an industry news service which publishes only a spot market price. There are no requirements to publically disclose trades, the quantity exchanged, the identity of those involved, or even the frequency of trades. This voluntary reporting system means a single reported trade can set the price of all gasoline in the state until the next trade is disclosed.

When the spot price is high, there is no incentive for the industry to report a trade that would immediately reduce the price of gasoline, even as the actual drivers of a price spike – whether global crude oil prices or supply disruptions – subside. This structure and lack of transparency

[70] Consumer Watchdog; "Legislation Targets Sky-High CA Gas Prices; Requires Oil Refiners To Disclose How Much They Make On Every Gallon of Gasoline Sold"; March 2022; https://consumerwatchdog.org/energy/legislation-targets-sky-high-ca-gas-prices-requires-oil-refiners-disclose-how-much-they-make/

[71] Data through 2018; CEC; "Additional Analysis on Gasoline Prices in California"; October 2019; https://www.energy.ca.gov/sites/default/files/2019-11/Gas_Price_Report.pdf

[72] Los Angeles Times; "Why California gas prices are so high and vary so widely: 'Mystery surcharge' and more"; March 2022; https://www.latimes.com/california/story/2022-03-14/gas-prices-vary-from-place-to-place

makes the spot market vulnerable to manipulation, as the California attorney general's (AG) office has alleged in past lawsuits.[73] In that suit, the AG claims energy traders manipulated the spot market after the Torrance refinery went offline in 2015. In a more recent example, according to Robert McCullough, an economist who has studied energy markets for decades, the spot price for gasoline didn't change for two weeks during the gasoline price spikes in 2022, reinforcing concerns that the spot market was being exploited to extend the duration of the price spike.[74]

Spot market deals in California generally range between 420,000 gallons (10,000 barrels) to 2.1 million gallons (50,000 barrels). The spot market price is the largest component of the price on the wholesale "rack market," which is typically sold in gasoline truck volumes of about 8,000 gallons (approximately 190 barrels). The price at the rack market is typically reflected in the retail price within a couple of days. According to the CEC, spot market prices are the biggest driver of statewide gasoline prices, even though they represent a small portion of gasoline sales each day. According to OPIS, "Nearly every gallon of gasoline, diesel, and jet fuel sold on the West Coast references OPIS spot prices."[75]

[73] *The People of the State of California v. Vitol Inc.;* Xavier Becerra, et al. "Complaint for Violations of the Cartwright Act and unfair competition law for damages, injunctive relief, civil penalties, and other equitable relief," filed May 11, 2020, San Francisco County Superior Court. https://oag.ca.gov/system/files/attachments/press-docs/CGC-20-584456%20Public%20Complaint%20only.pdf

[74] Los Angeles Times; "Opinion: Who profits from Southern California's high gas bills? The problem is we don't know"; March 2023; https://www.latimes.com/opinion/story/2023-03-13/natural-gas-price-socalgas

[75] OPIS West Coast Spot Market Report. https://www.opisnet.com/product/pricing/spot/west-coast-spot-market-report/