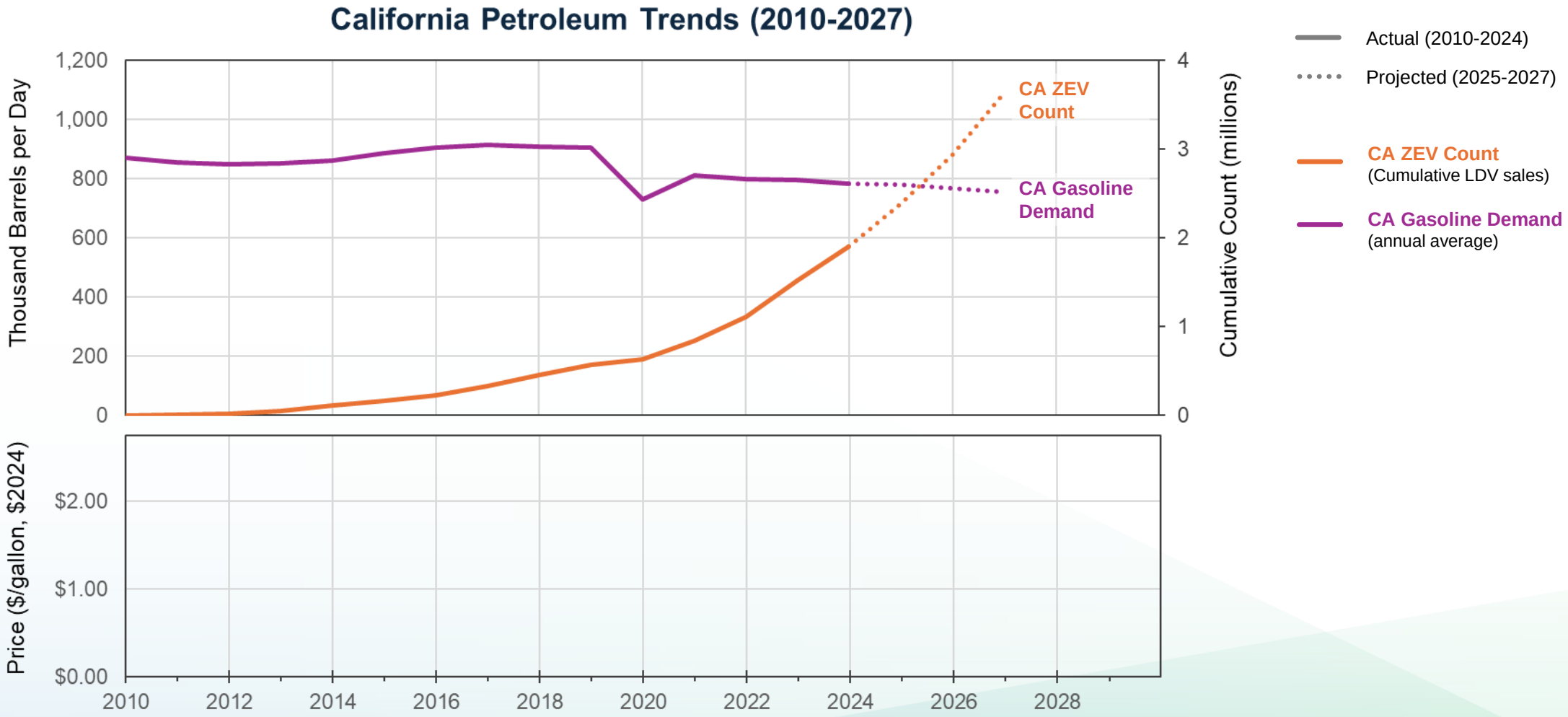
California's Transportation Fuels Transition

Assembly Utilities and Energy Committee - Oversight Hearing

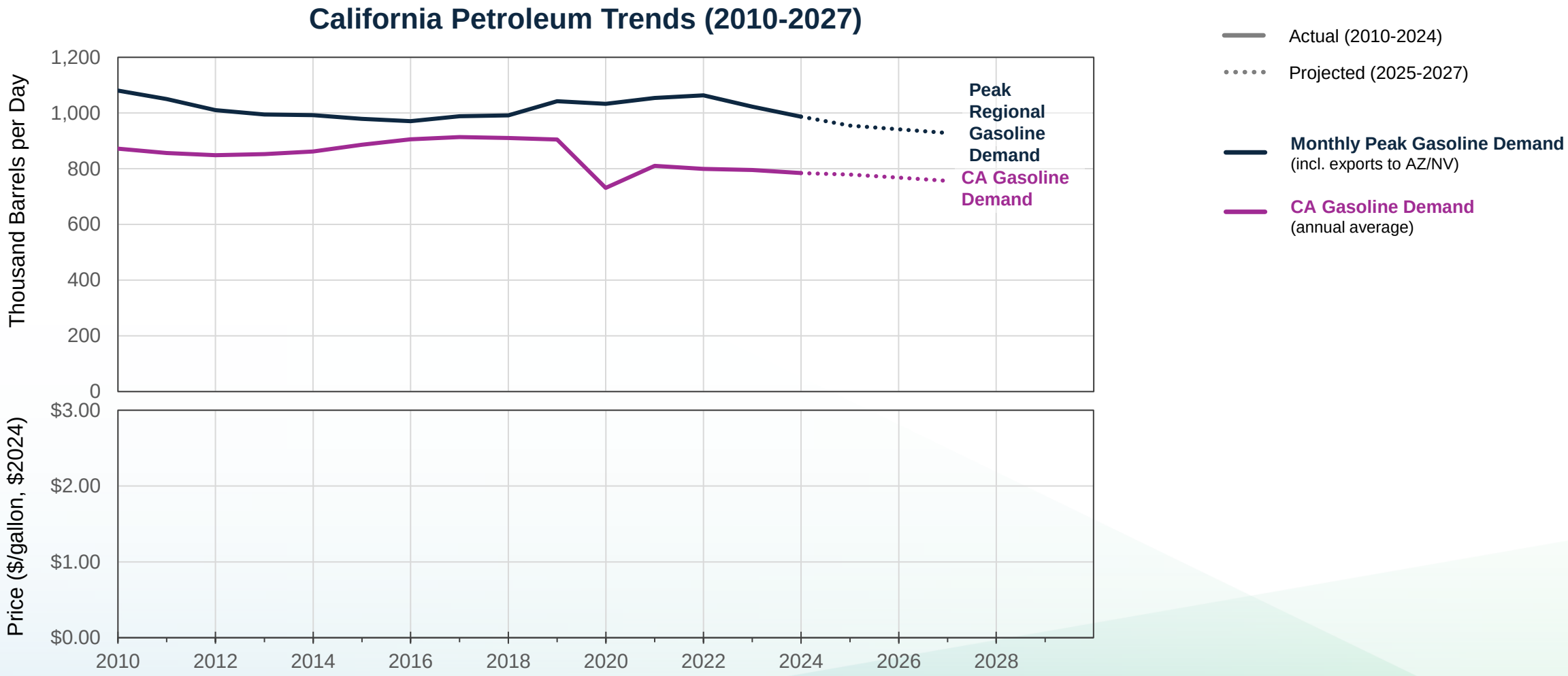
May 28, 2025

California Petroleum Trends



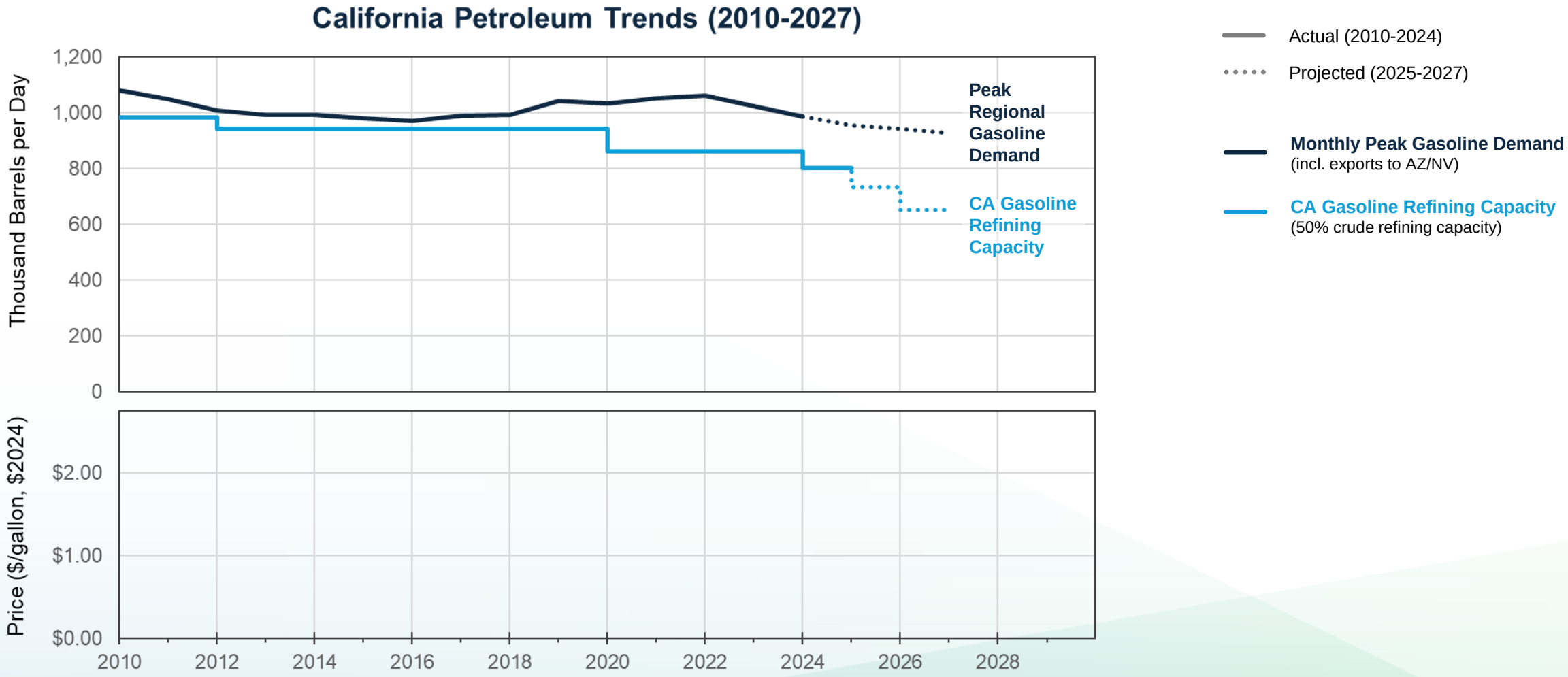
Sources: CEC, CDTFA, DOC, U.S. EIA

California Petroleum Trends



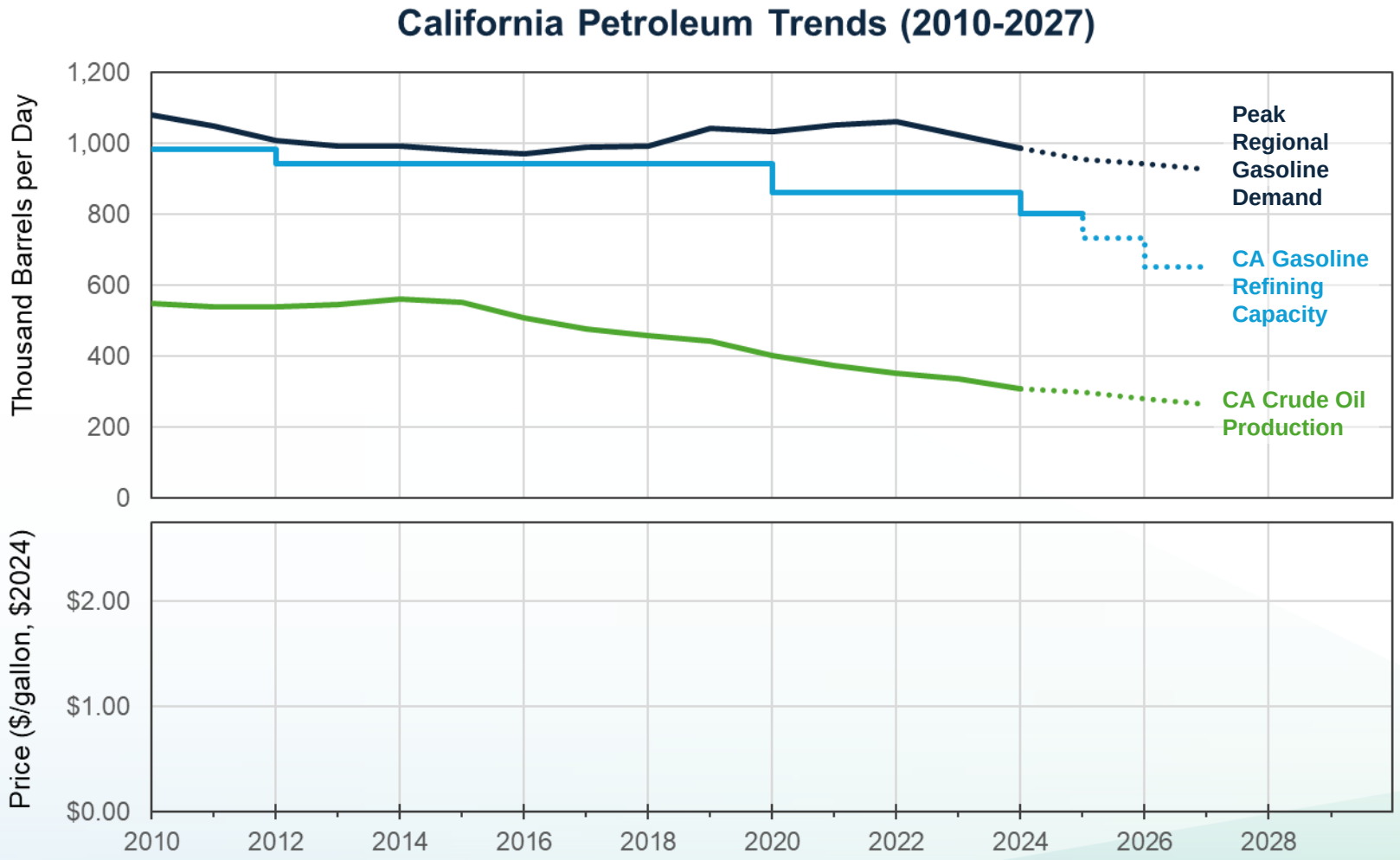
Sources: CEC, CDTFA, DOC, U.S. EIA

California Petroleum Trends



Sources: CEC, CDTFA, DOC, U.S. EIA

California Petroleum Trends



Actual (2010-2024)

Projected (2025-2027)

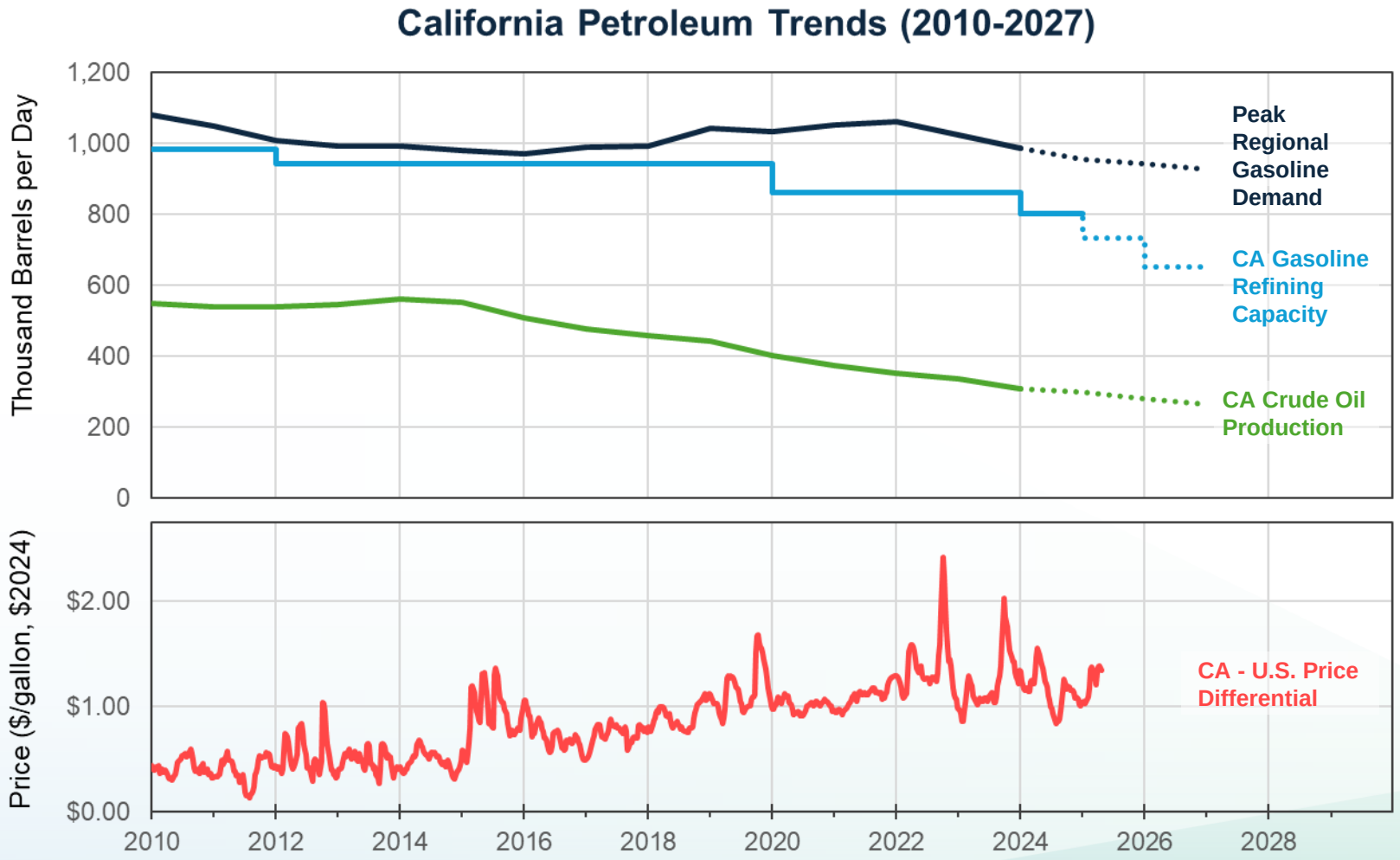
Monthly Peak Gasoline Demand
(incl. exports to AZ/NV)

CA Gasoline Refining Capacity
(50% crude refining capacity)

CA Crude Oil Production

Sources: CEC, CDTFA, DOC, U.S. EIA

California Petroleum Trends



Actual (2010-2024)

Projected (2025-2027)

Monthly Peak Gasoline Demand
(incl. exports to AZ/NV)

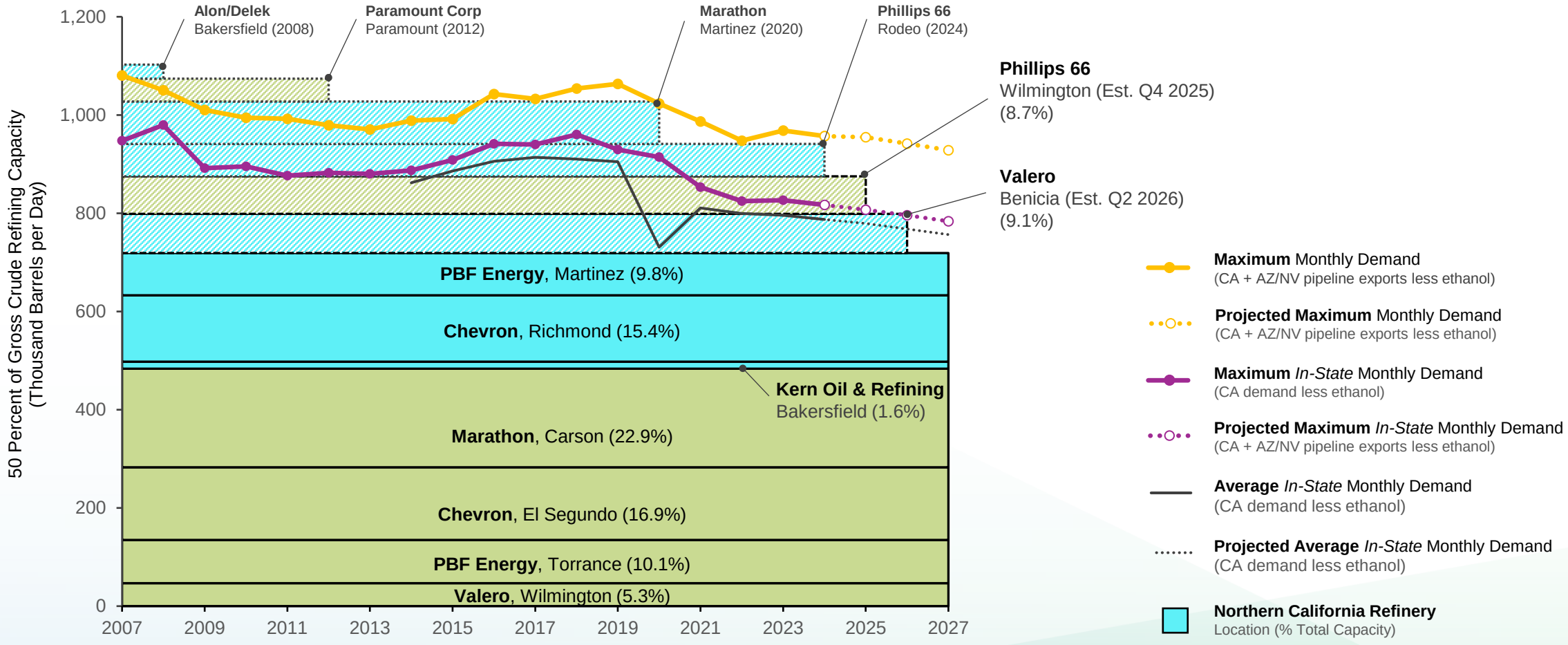
CA Gasoline Refining Capacity
(50% crude refining capacity)

CA Crude Oil Production

CA-U.S. Price Differential
(Regular grade, $2024)

Sources: CEC, CDTFA, DOC, U.S. EIA

Estimated Gasoline Refinery Capacity



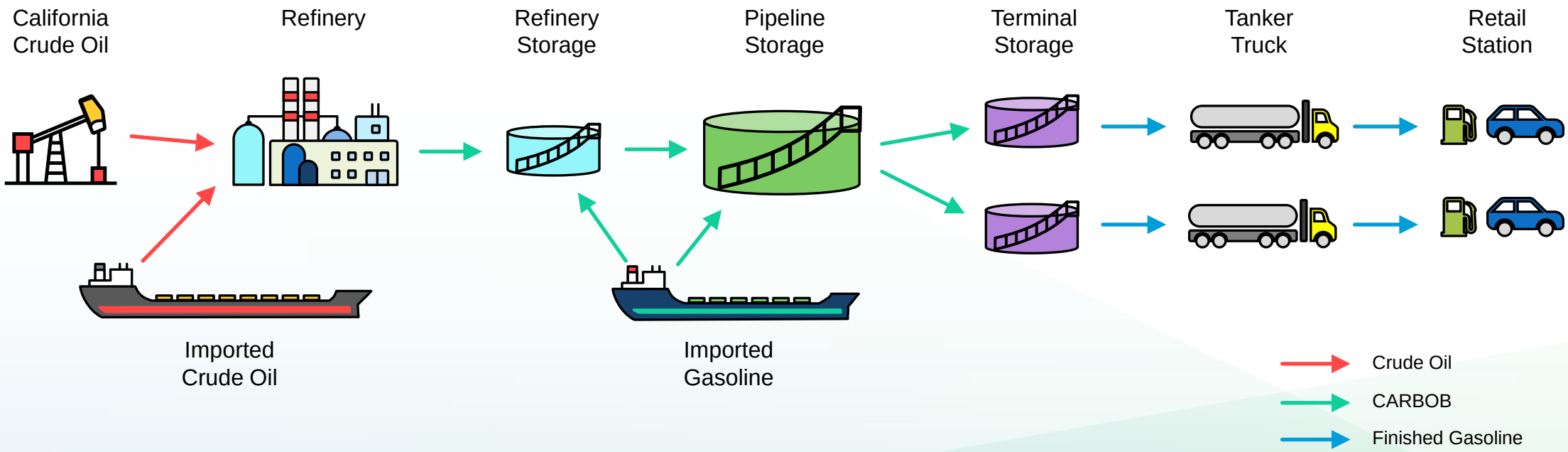
Source: CEC Staff, CDTFA

Petroleum Value Chain

Domestic and imported crude oil is processed at refineries into gasoline and other products.

Gasoline from refineries and additional imports are delivered to pipeline hubs.

Gasoline is blended with ethanol and loaded onto trucks at racks to be delivered to retail stations.



Sources: U.S. Energy Information Administration, CEC

Petroleum Strategy Task Force

Roles in Transportation Fuels Sector

1. Scoping Plan
2. Air quality regulations
3. Carbon market/Cap-and-Invest

1. Data collection
   (PIIRA, SB 1322 (2022), SB X1-2 (2023))
2. State emergency planning
   (Petroleum Fuels Set Aside Program)
3. Regulatory authority to mitigate gasoline price spikes

1. Market oversight and investigations
2. Economic and policy analysis

Building Upon California's Leadership

We are in the midst of a defining challenge in our energy transition. Once again, California will lead the way.

Long-standing commitment to **climate, air quality, health, and the environment**

Recent actions to enhance **consumer protections**

Need for leading the transition:

- Support **investment confidence** for industry-wide de-risking of premature **exits** and supporting safe, reliable operations
- Expanding **community and worker safeguards**

The Road
to Zero Emissions

CARB has put a roadmap in place to drastically reduce our dependence on petroleum in the transportation sector by 2045.

AB 32

Requires we cut GHGs.

To reach goals, fuel use must be cut by 94%.

How cuts happen?

Zero emission cars, trucks and fuels.

CLEAN VEHICLE PROGRAMS

CARB rules advance zero-emission vehicle deployment:

- 100% light-duty sales requirements by 2035
- Requirements to increase sales of zero-emission trucks
- Incentives and other programs to help fleets adopt cleaner technology

LCFS

Makes fuel less polluting and encourages production of cleaner alternatives

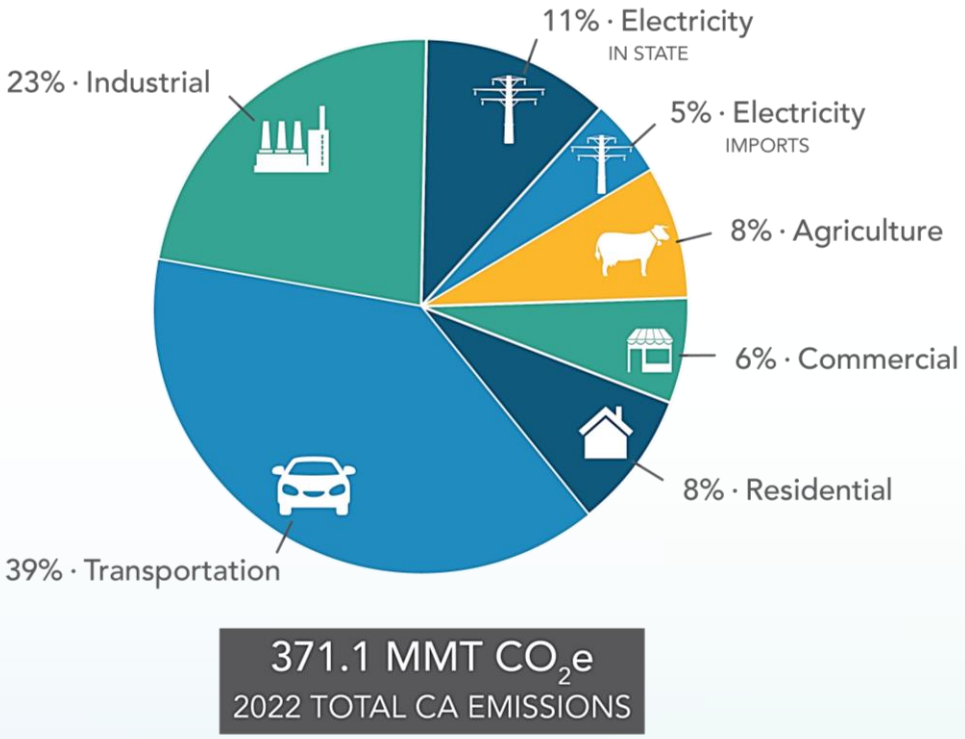
How it works:

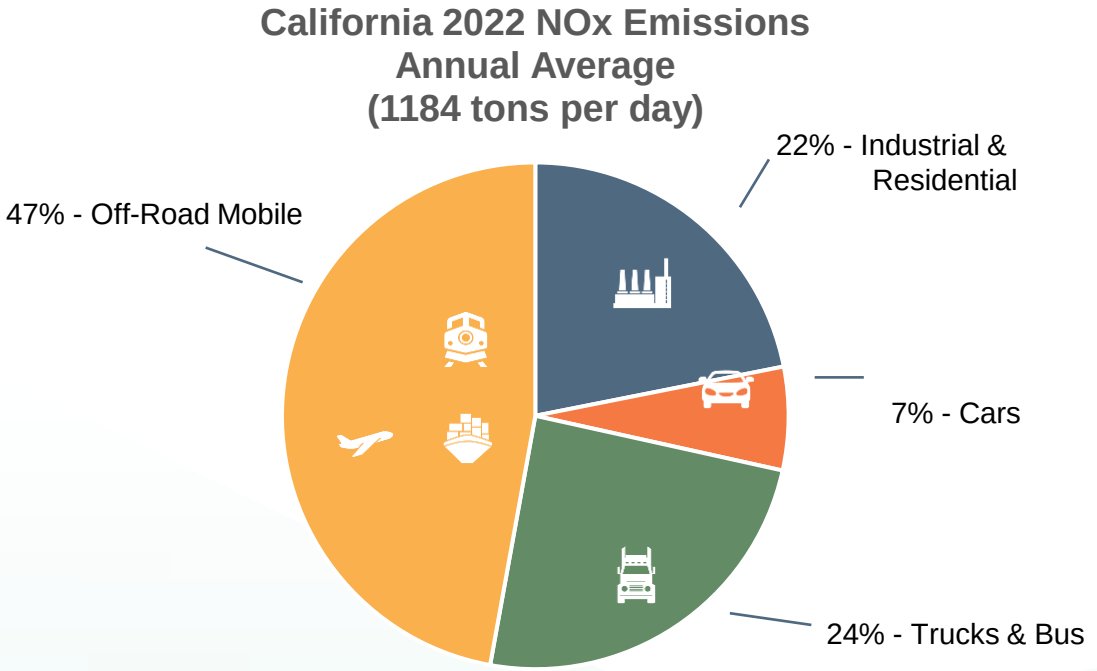
All together, these actions will help us build a cleaner, healthier California for current and future generations.

Governor Newsom creates new oversight committee to monitor oil companies

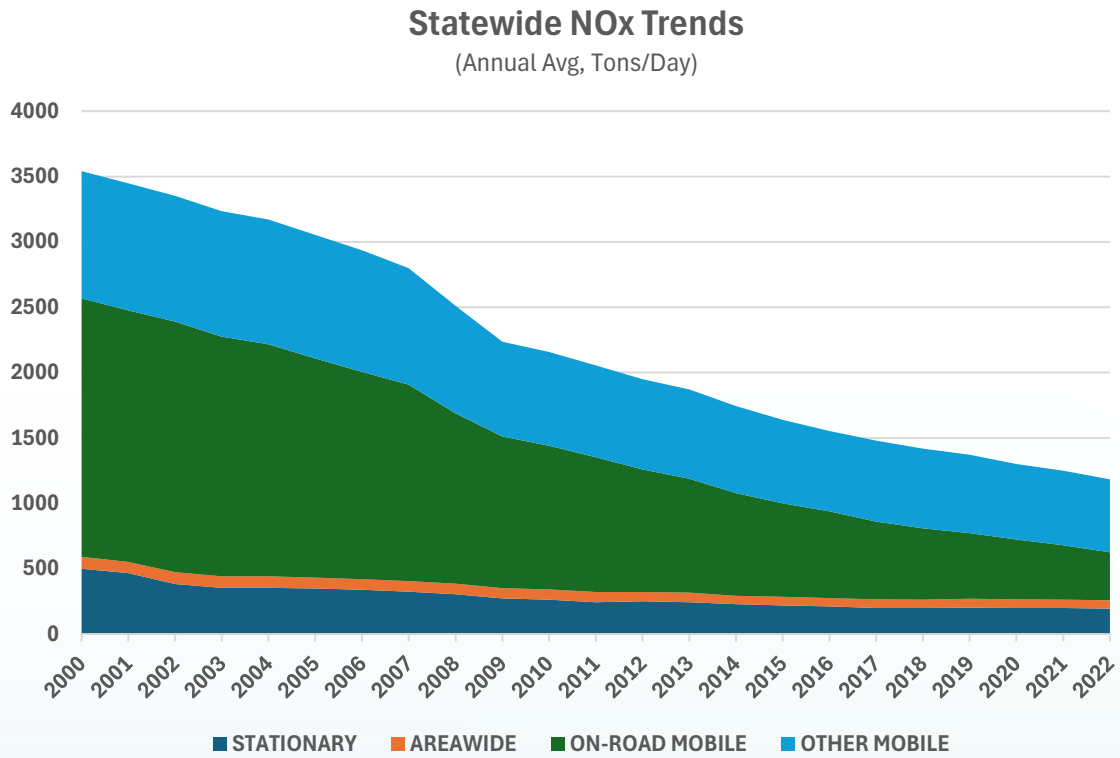
CARB

California Transportation Sector: Largest Source of Climate & Air Pollution





Air Quality Success: Reducing Smog-Forming NOx

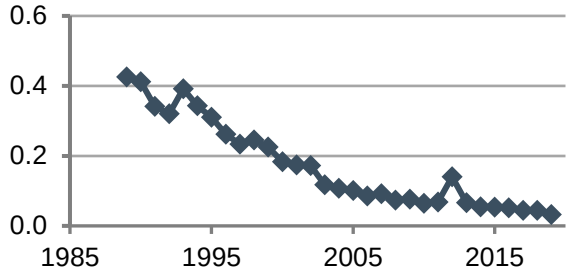


**Total NOx combines NO2, NO, and additional species (so NOx is higher than NO2 alone); Marine Extent: 100 Nautical Miles From Shore*

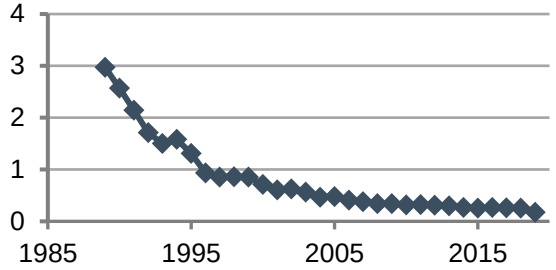
Dealing with Los Angeles Smog in 1958

Air Quality Success: Reducing Toxic Air Contaminants

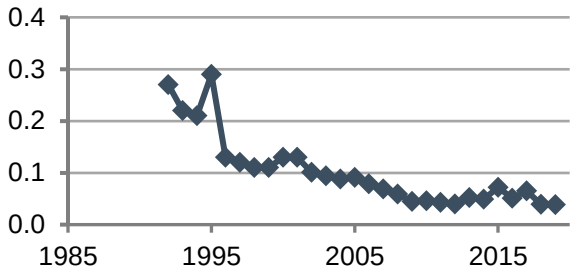
1,3-Butadiene
Air Monitor Trend - Mean (ppb)



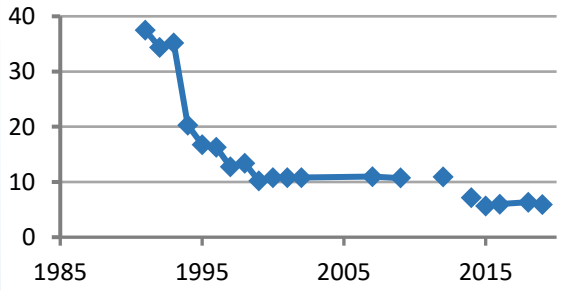
Benzene
Air Monitor Trend - Mean (ppb)



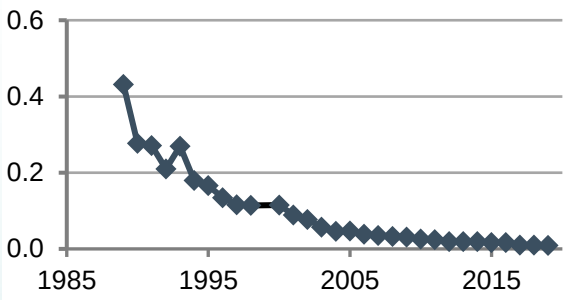
Hexavalent Chrome
Air Monitor Trend - Mean (ppb)



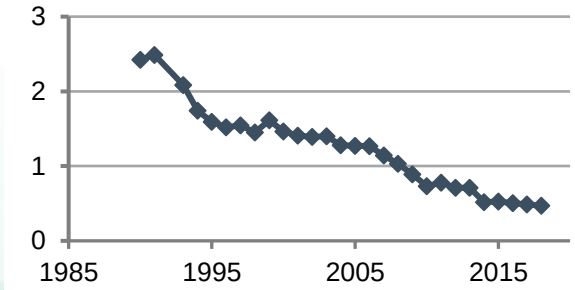
Lead
Air Monitor Trend - Mean (ng/m3)



Perchloroethylene
Air Monitor Trend - Mean (ppb)



Diesel PM
Air Monitor Trend - Mean (µg/m3)



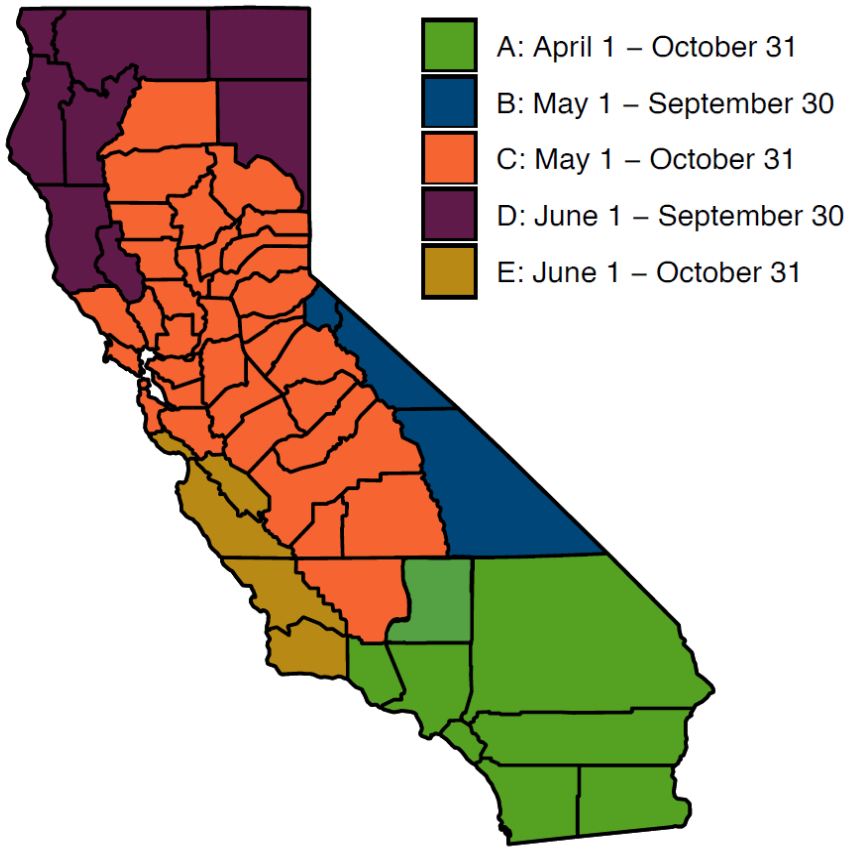
History of California Fuel Standards

- California has been regulating gasoline blends to reduce air pollution since 1971
- Standards updated several times
  - Removed lead
  - Phased out MTBE additive
- Last revised in 2007

California Summer vs. Winter Fuel Blends

- Summer blend helps limit ozone formation
- The longest summer blend period is April 1 to October 31
- Use of these fuels is part of the State Implementation Plan to achieve federal air quality standards.

CALIFORNIA RVP CONTROL PERIODS BY AIR BASIN AT RETAIL STATION



Source: CARB

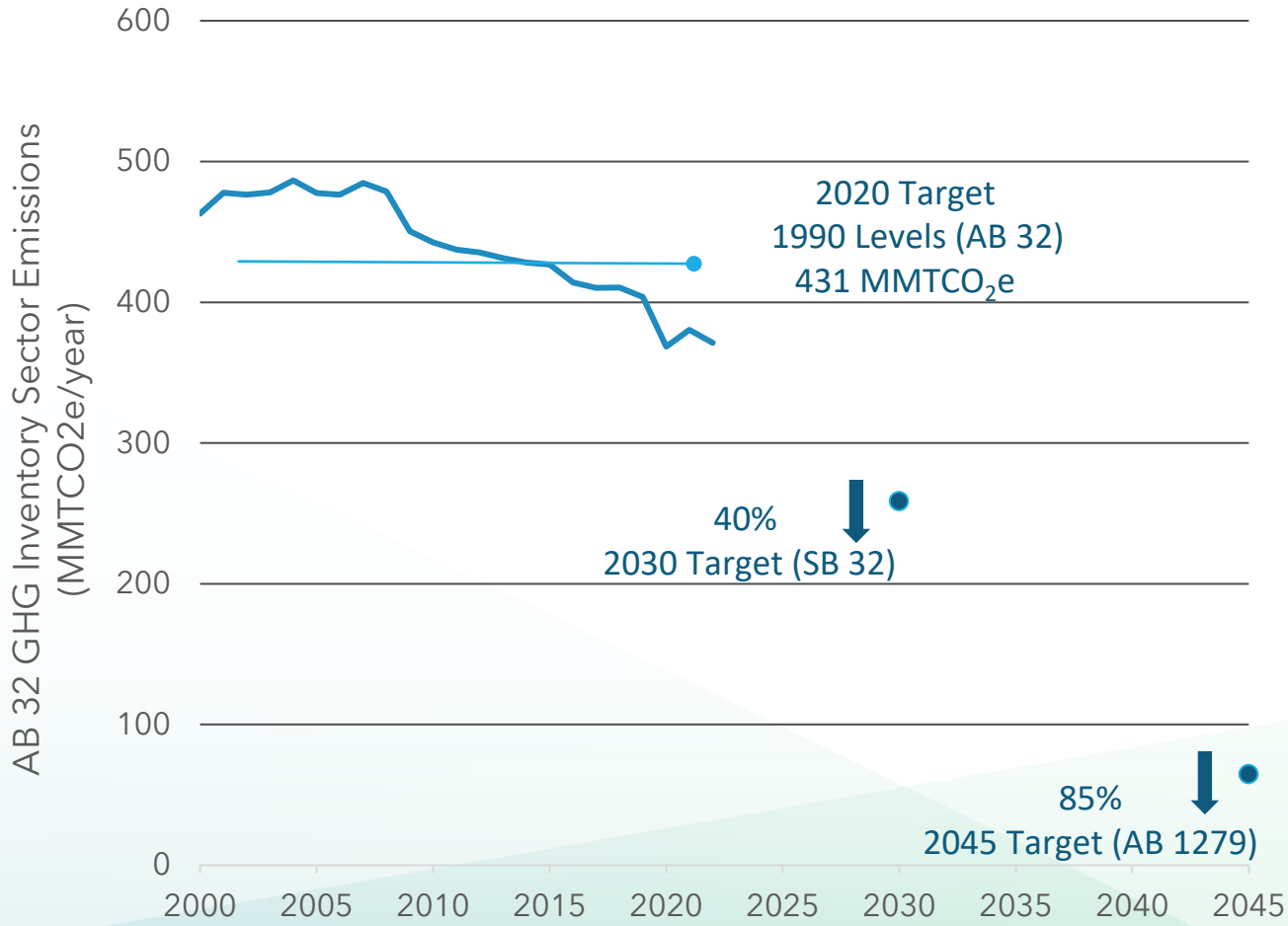
More Progress Needed

- 18 million Californians live in areas that exceed federal air pollution standards
- Over 5,000 premature deaths and hundreds of emergency room visits are linked to air pollution
- Low-income and disadvantaged communities experience disproportionately high levels of air pollution

70 ppb Ozone Nonattainment Areas

California's Climate Goals

ACHIEVING
CARBON
NEUTRALITY
BY **2045**



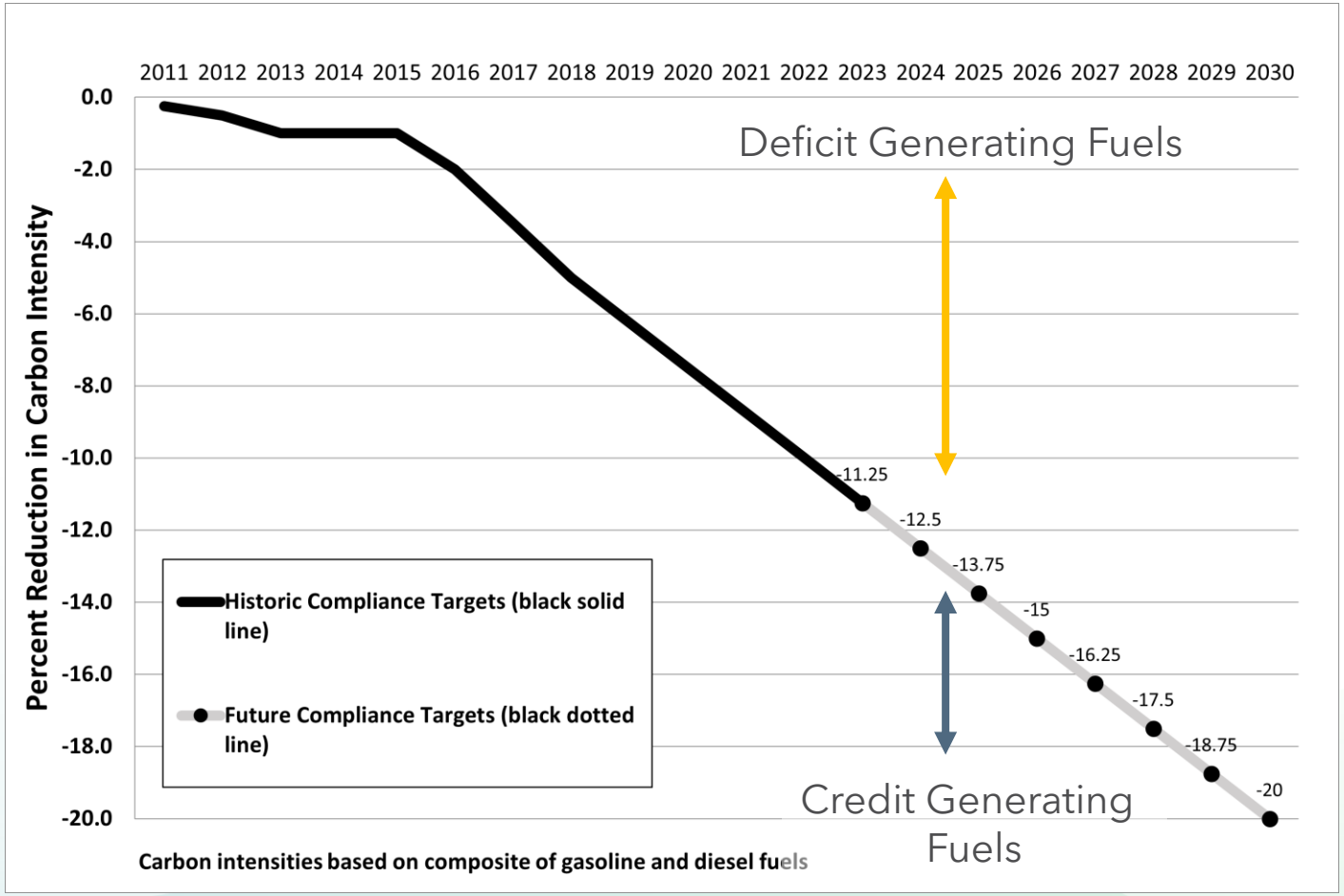
Policy Drivers - Key State Legislation

- **AB 32 (2006):** 2020 greenhouse gas (GHG) emission reduction target to 1990 levels calls for a Scoping Plan and updates at least every 5 years
- **SB 32 (2016)**: 2030 GHG emission reduction target of 40% below 1990 levels
- **SB 1383 (2016)**: 2030 short-lived climate pollutant reduction targets
- **AB 197 (2016):** Specific analyses for the Scoping Plan

- **2022 legislation shaping the most recent Scoping Plan:**
  - **AB 1279:** 2045 carbon neutrality target with direct GHG emissions reduction of 85%
  - **SB 905:** Established a Carbon Capture, Removal, Utilization and Storage Program
  - **SB 846:** Extended the Diablo Canyon Power Plant's operations
  - **SB 1020:** Established interim clean electricity targets: 90% (2035) and 95% (2040) to 100% (2045)
  - **SB 1137:** Oil and gas well setbacks of 3,200 feet
  - **SB 1075:** Evaluate the role of clean hydrogen in California
  - **AB 1757:** Requires setting of natural and working lands targets
  - **AB 2251:** 2035 urban tree cover increase of 10%

Low Carbon Fuel Standard

- Establishes an annual, declining carbon intensity target for transportation fuels used in California
- Lower carbon fuels generate credits



Low Carbon Fuel Standard - Benefits

15.3% reduction in the carbon intensity of transportation fuels

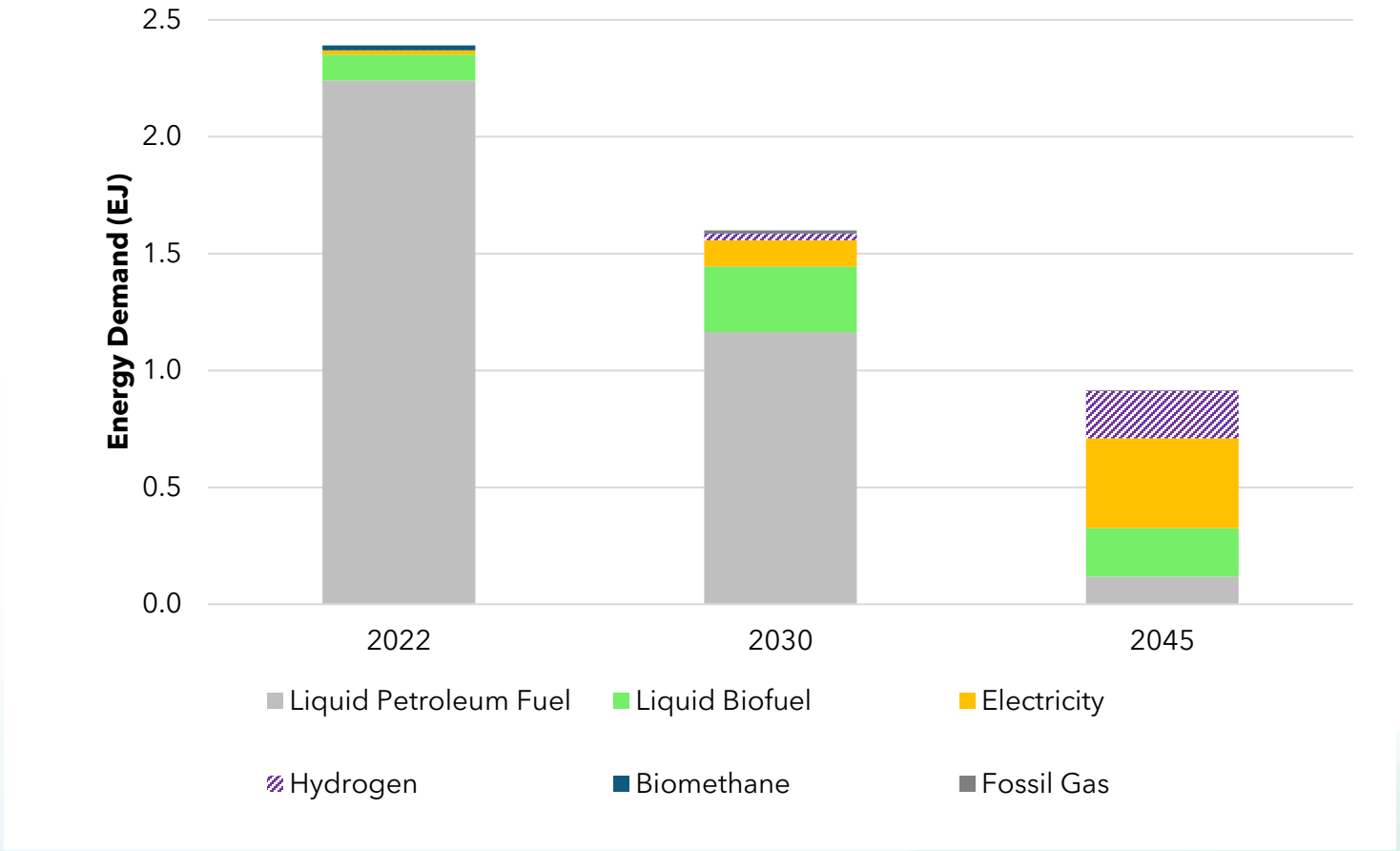
Over 31 billion gallons of petroleum fuels displaced by low-carbon fuels

75% of fossil diesel displaced by renewable diesel in 2024

$4 billion annually to support low-carbon investments and including transit

Provides financial assistance for public fleets

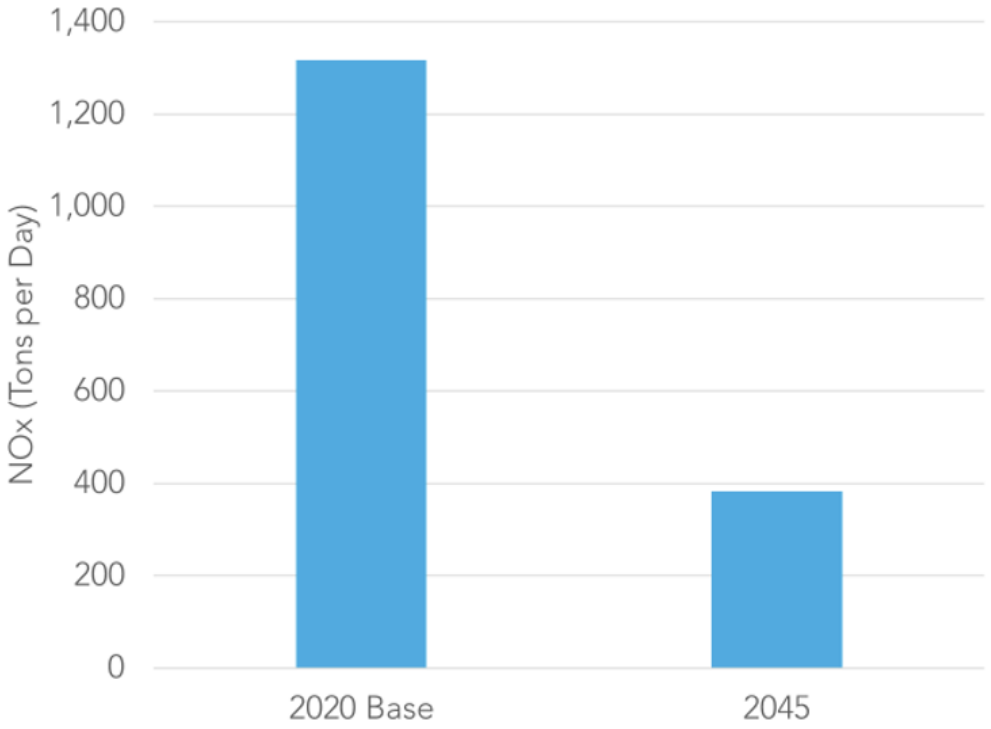
California's Projected Transportation Fuel Mix



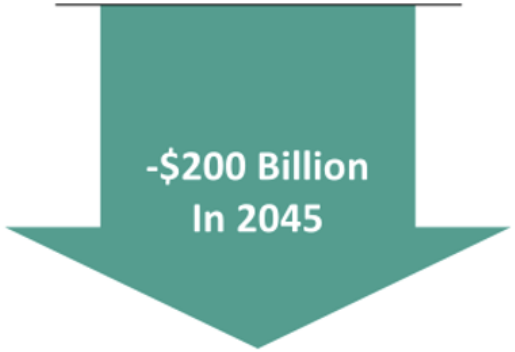
On-road transportation fuel mix, 2022 Scoping Plan

Benefits of Reducing Fossil Fuel Use

71% reduction in air pollution



$200 Billion in health cost savings from decreased fuel combustion



Source: 2022 Scoping Plan Update

Ongoing Demand from Other Sectors

- Aviation Fuel
- Ocean-Going Vessel Fuel
- Offroad Fuel
- Exports to Other Markets
- Hydrogen
- Refining Co-products

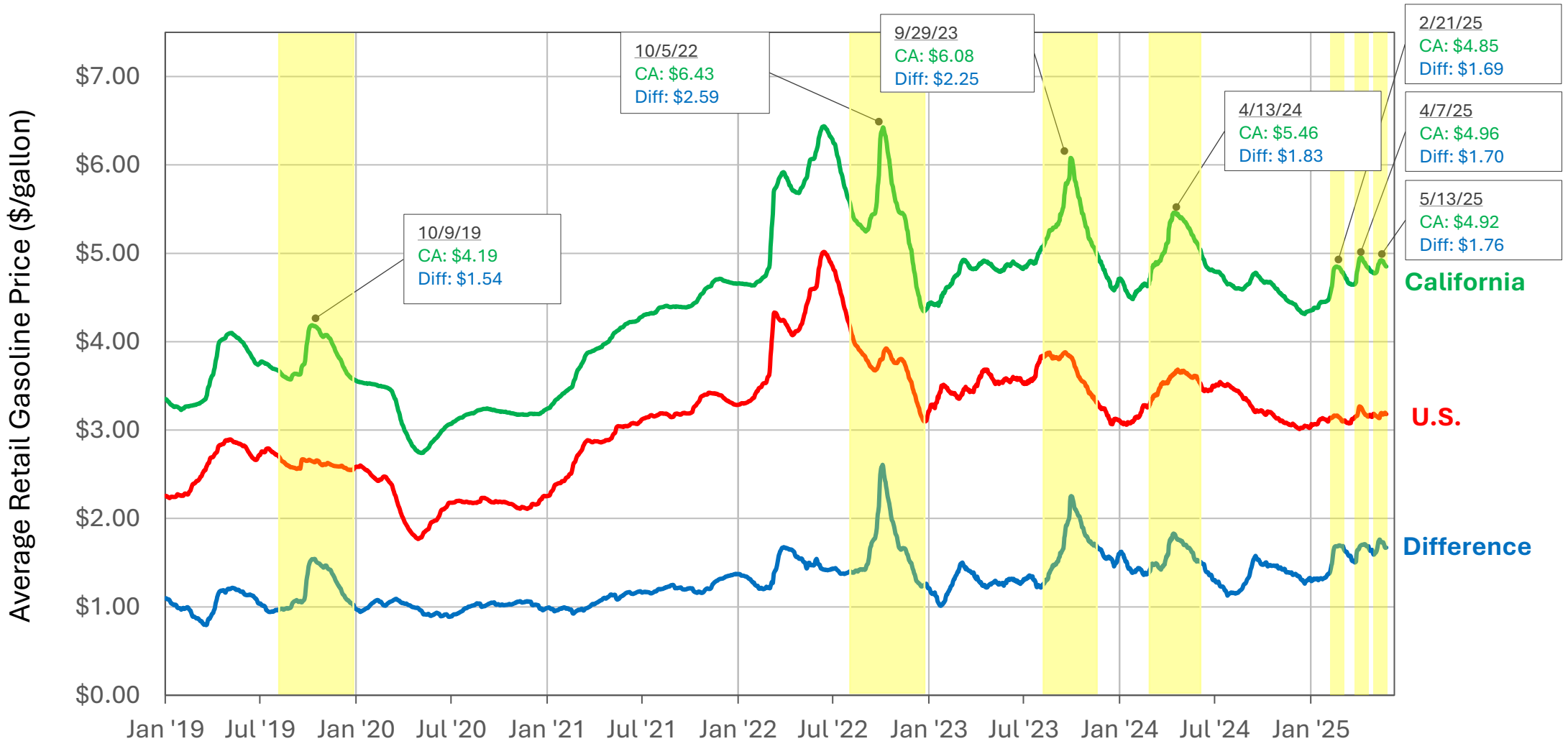
Ocean-Going Vessels At Berth Requirements

- 2020 update builds on 2007 regulation and sets compliance deadlines for tankers:
  - Southern CA terminals: January 1, 2025
  - Northern CA terminals: January 1, 2027

- Implementation & Compliance Progress
  - Tanker visits and fuel import volumes remain unaffected
  - Majority of Southern CA terminals have established compliance pathways for all their visits
  - Northern CA terminals will submit updated plans by Feb. 2026 in preparation for compliance

Price Differentials

California vs. U.S. Average Retail Gasoline Price (2019-Current)



SB X1-2 & AB X2-1 Authorities & Requirements

Transparency

- Data Collection & Monitoring
- Petroleum Refinery Maintenance Monitoring
- Market Oversight Analysis

Planning

- Transportation Fuels Assessment (CEC)
- Transportation Fuels Transition Plan (CEC & CARB)

Regulatory Tools

- Resupply for Planned Maintenance
- Minimum Inventory Requirements
- Refining Margin Establishment & Penalty Determination

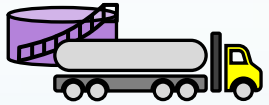
Data Collection & Monitoring

Reporting Entities:

Crude oil Producers and Transporters

Petroleum Refiners

Petroleum Importers and Exporters



Petroleum Product Marketers, Storers, and Transporters

Fuel Retailers

Data Collected:

Production	Exports
Maintenance	Sales
Inventory	Costs
Imports	Profits

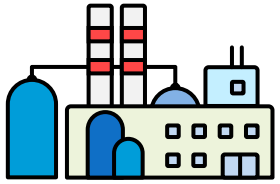
What Drives California Retail Gasoline Price Fluctuations?

NYMEX

Paper market.

Influenced by:

- Crude oil
- Global events
- Tariffs



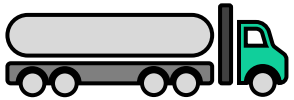
(LA & SF)

Spot Markets

Physical market, high volume, located at refinery hubs.

Influenced by:

- Gasoline supply
- Refinery outages
- Trading activity
- Summer/winter blend



Rack Market

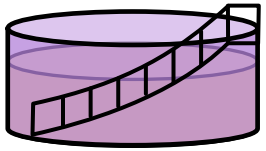
Smaller volume market, often located off a pipeline. Follows spot market.

Retail Market

Street price. Follows rack price, but often 2-3 day delay.

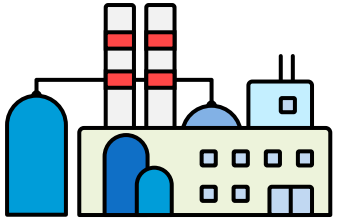
California-Specific Market Dynamics

SUPPLY



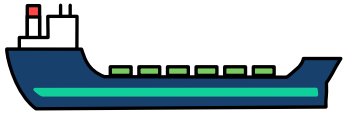
Gasoline Inventories

+



Refinery Production

+

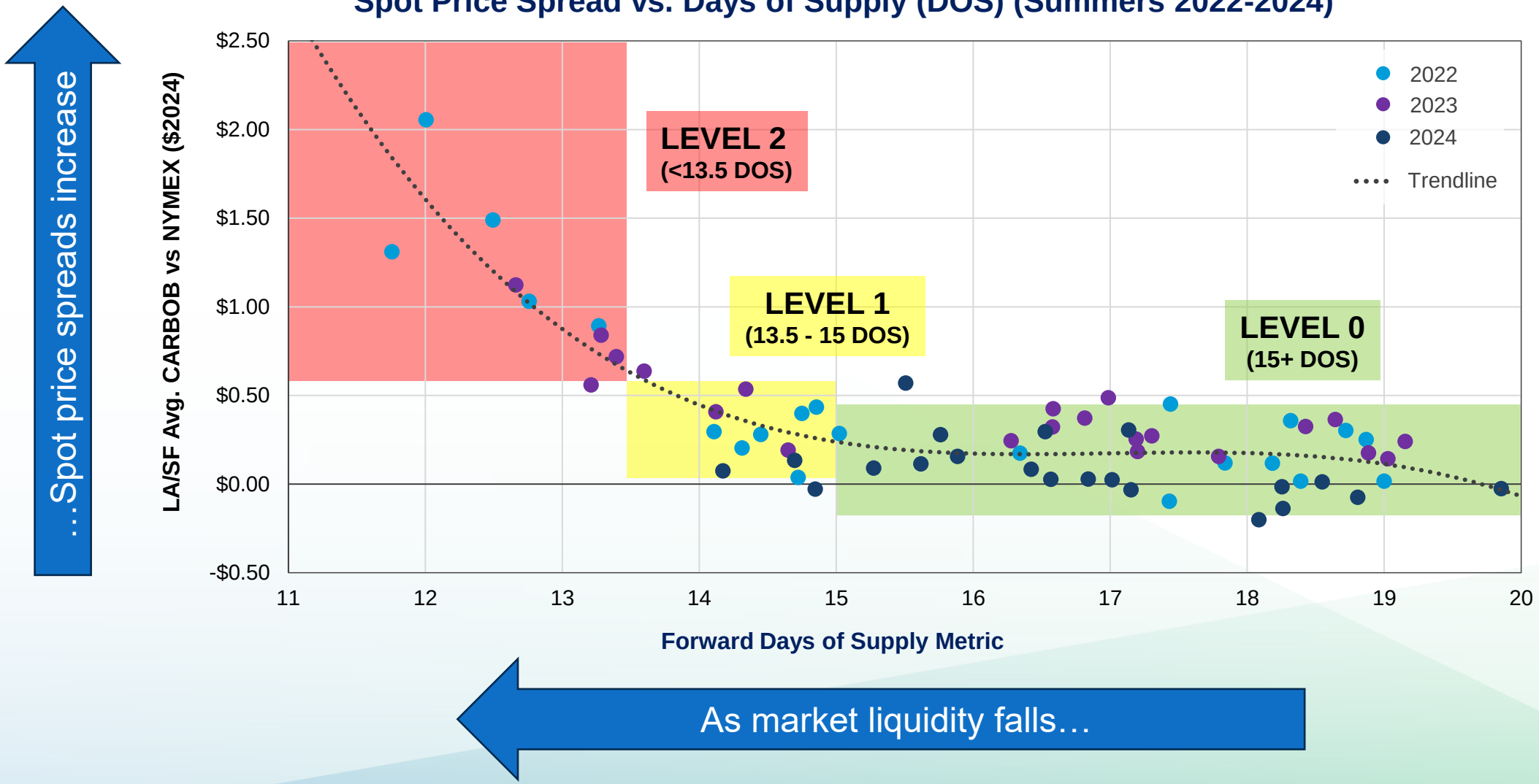


Marine Imports

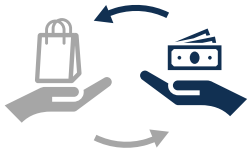
DEMAND

Gasoline Demand

Establishing Price Risk Levels

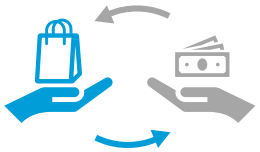


Transportation Fuels Assessment: Option Summary



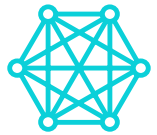
Demand Strategy

1. Enhanced ZEV Access
2. VMT Reduction Strategies
3. Fuel Conservation



Supply Strategy

4. Storage Strategies
5. Production Enhancement Strategies (*e.g.* E15, RVP modification)
6. Alignment of Gasoline Specifications for Western States
7. Import Strategies



Highly Complex

8. Gas Price Stabilization Fund
9. Cost of Service Model
10. State-Owned Refineries
11. Retail Margin Management

Other

12. Railcar Replenishment

Fuels Transition Plan (CEC/CARB)

Requirements

The CEC and CARB must develop and submit a Transportation Fuels Transition Plan.

This plan will discuss strategies aimed at ensuring the supply of transportation fuels is affordable, reliable, equitable and adequate to meet the demand described in the 2022 Scoping Plan.

Progress

Joint-Agency Kick-Off Workshop

May 3, 2024

Stakeholder and Community Meetings

May – December 2024: Coordination
Early 2025: Community Meetings

- Richmond
- Bakersfield
- Wilmington

Modeling Results Release

Late 2025

Submit plan (with CARB)

Division of Petroleum Market Oversight

Established by Senate Bill X1-2 (Skinner, 2023), the California Gas Price Gouging and Transparency Law, **DPMO's statutory mandate is to protect California consumers.** DPMO's work falls into two broad categories:

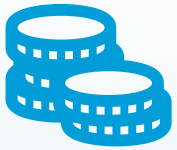
Independent Oversight and Investigations: Monitoring the market; identifying flaws in market structure, market power abuses, and any other way market participants act anticompetitively or harm consumers; referring potential violations of the law for prosecution.

Economic and Policy Analysis: Providing policymakers with expert analysis, findings, and recommendations on transportation fuels markets and the interplay with California's clean transportation transition.

Early Priorities

Establishing visible oversight and investigative presence: Quickly standing up DPMO and engaging with industry to deter and detect misconduct, and to improve compliance with reporting obligations.

Understanding and mitigating price spikes: Identifying root causes for the 2022-2023 price spikes (inadequate resupply, low inventories, volatile spot market) and bringing transparency to the public.



Unraveling the mystery gasoline surcharge: Using data to explore why California retail gasoline prices are elevated, even after accounting for taxes, fees, and environmental programs.

Gasoline Affordability Challenges

Price spikes: California's gasoline market is uniquely susceptible to price spikes caused by refinery upsets (inadequate resupply, low inventories) and a volatile, thinly-traded spot market

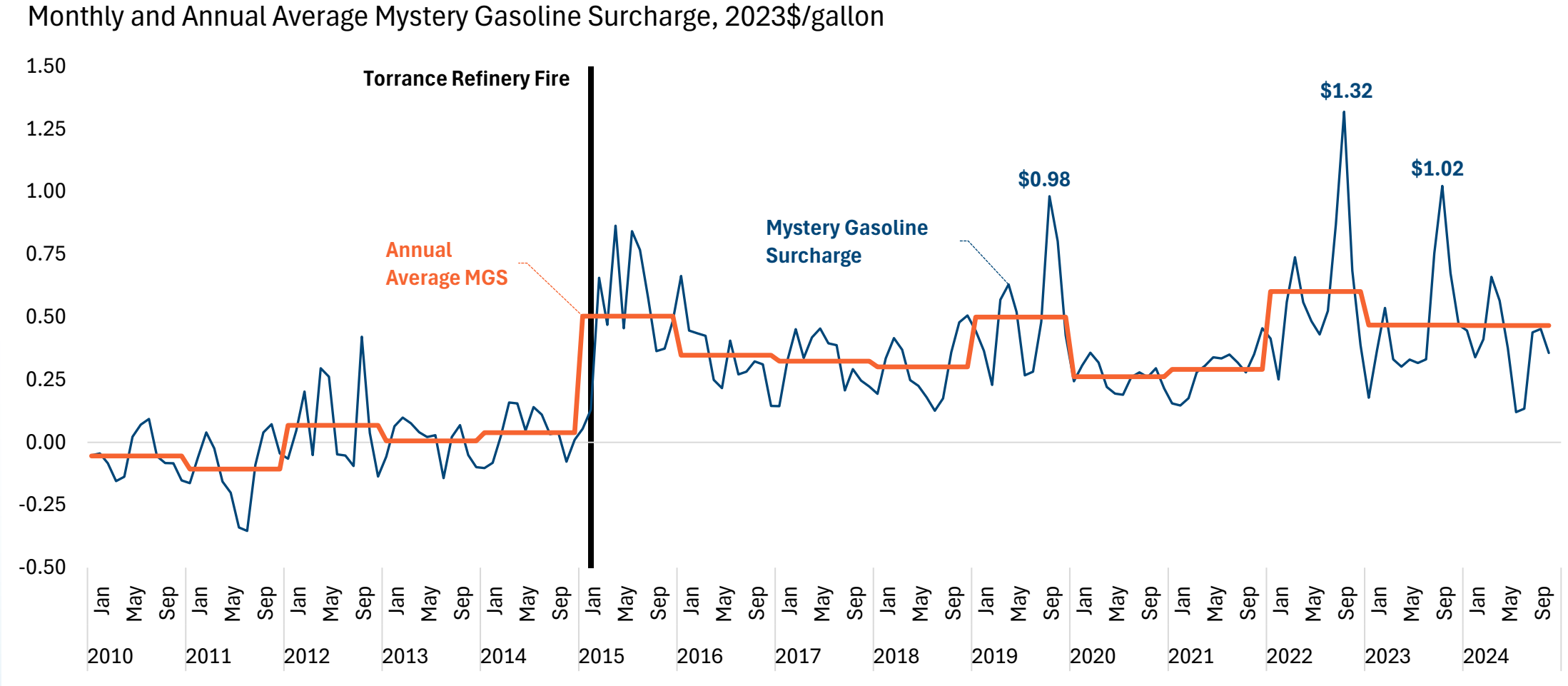
Rising branded markups: The gap between branded and unbranded retail gasoline prices is growing and reaching unprecedented levels not seen in the rest of the U.S.

Neither of these affordability challenges can be fully explained by publicly-enacted taxes, fees, and environmental program costs

What the Data Shows

1. **Elevated price levels:** Retail gasoline prices in California averaged $0.41 per gallon higher than prices in other states *after* accounting for taxes, fees, and environmental program costs since 2015

Mystery Gasoline Surcharge



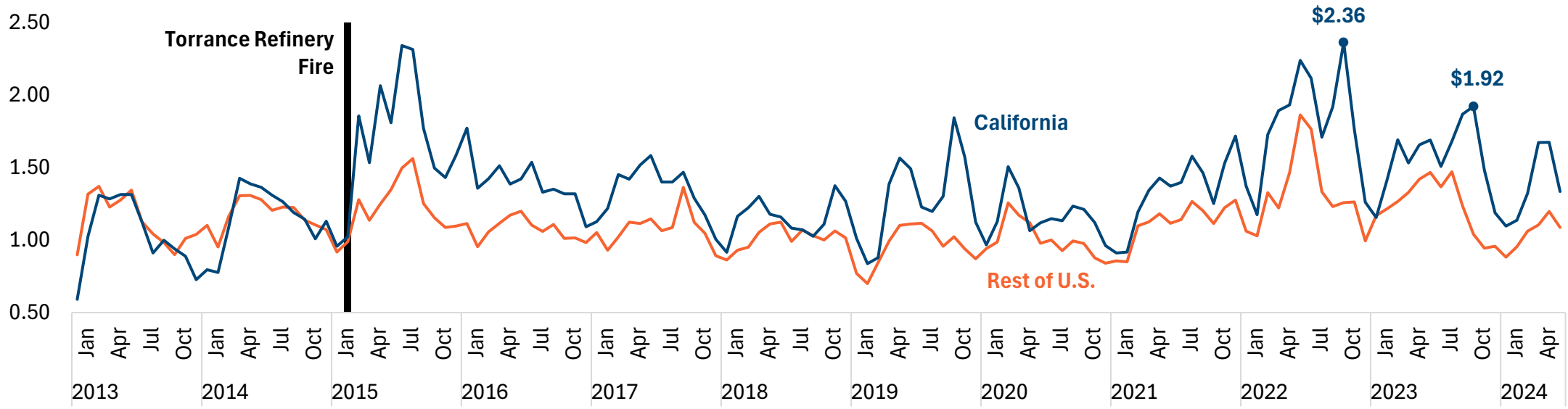
DPMO analysis of EIA, CDTFA, and CARB data.

What the Data Shows

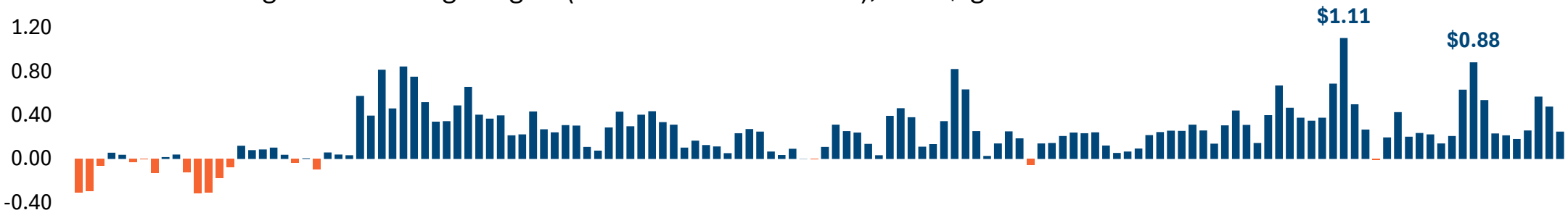
1. **Elevated price levels**
2. **Elevated industry margins:** Gross gasoline industry margins in California increased by $0.36 per gallon relative to the rest of the U.S. since 2015; margins peaked at $2.36 during the fall 2022 price spike

Gross Gasoline Industry Margins

Gross Refining and Marketing Margins in California and Rest of U.S., 2023$/gallon



Difference in Refining and Marketing Margins (California - Rest of U.S.), 2023$/gallon



DPMO analysis of EIA, CDTFA, and CARB data.

What the Data Shows

1. **Elevated price levels**
2. **Elevated industry margins**
3. **The role of market power:** About 90% of in-state refining capacity is controlled by four companies, and about 50% of refiner sales are through vertically integrated sales channels

Market Concentration

Crude Refining Capacity Among California Refiners with Gasoline Production
October 2024

Rank	Refiner with Gasoline Production Capacity	Total CA Crude Refining Capacity (BPD)	Share of Total CA Crude Refining Capacity	Cum. Share of CA Crude Refining Capacity
1	Chevron Corp	514,271	32%	32%
2	Marathon Petroleum Corp	365,000	23%	55%
3	PBF Energy Co LLC	316,400	20%	75%
4	Valero Energy Corp	230,000	14%	89%
5	Phillips 66 Company	139,000	9%	98%
6	Kern Oil & Refining Co	26,000	2%	100%
Four-Firm Concentration Ratio in Rest of U.S.				48.0%

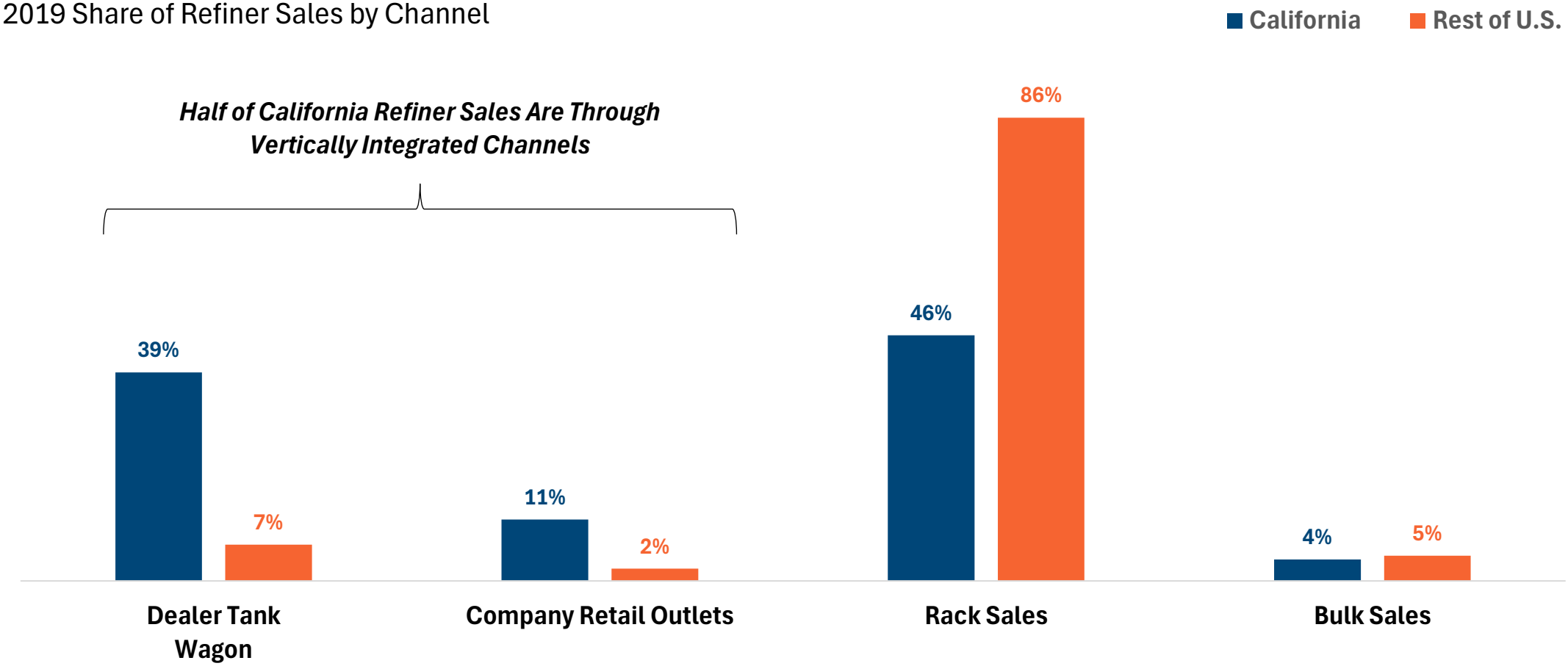
Top two share increases to 61% in late 2025

Top four share increases to 98% in late 2025

DPMO analysis of data from EIA Form 820. Table includes refineries with gasoline capacity, excludes refineries that do not produce gasoline and the Phillips 66 Rodeo facility, which converted to renewable fuel in March 2024. Rank is based on total crude refining capacity, which includes a company's refining capacity across refineries and products.

Vertical Integration

2019 Share of Refiner Sales by Channel

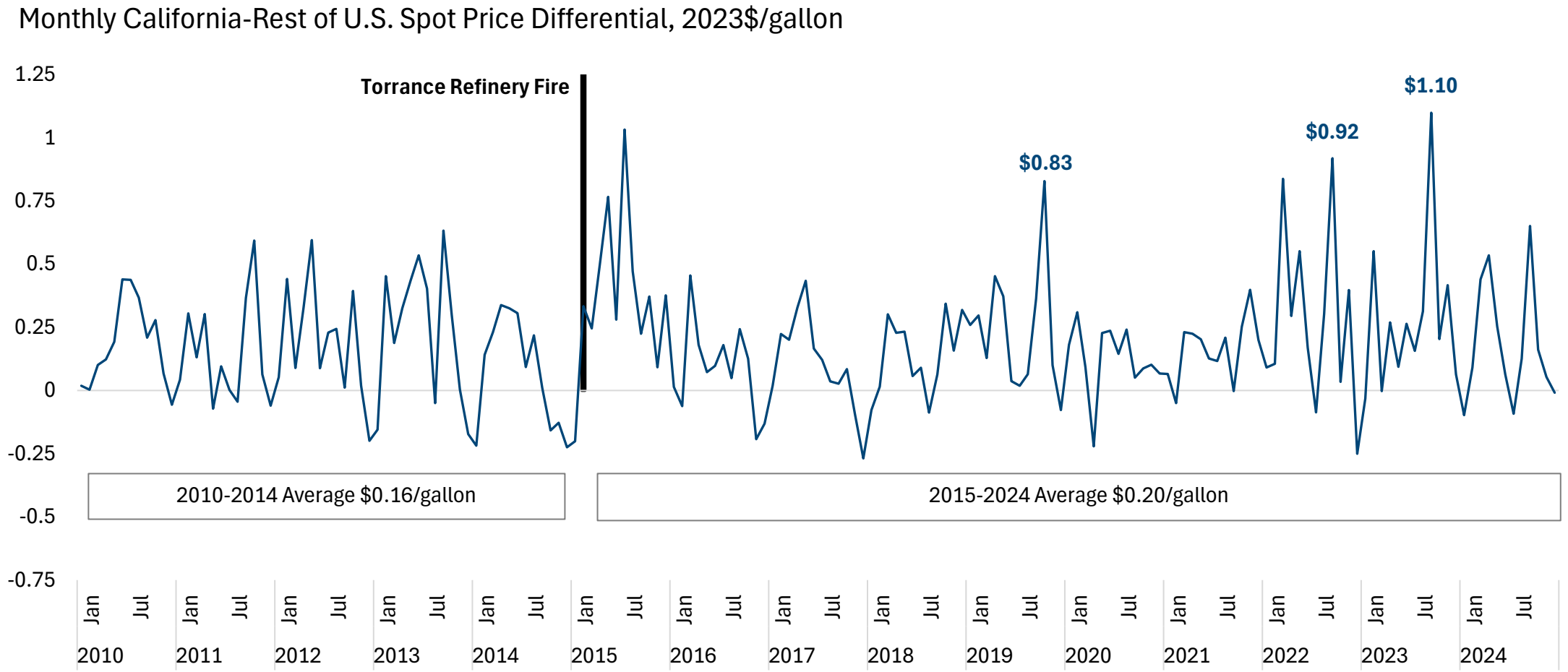


DPMO analysis of data from EIA Form 782 data. 2019 is the most recent year for which federal and state sales channel data is publicly available.

What the Data Shows

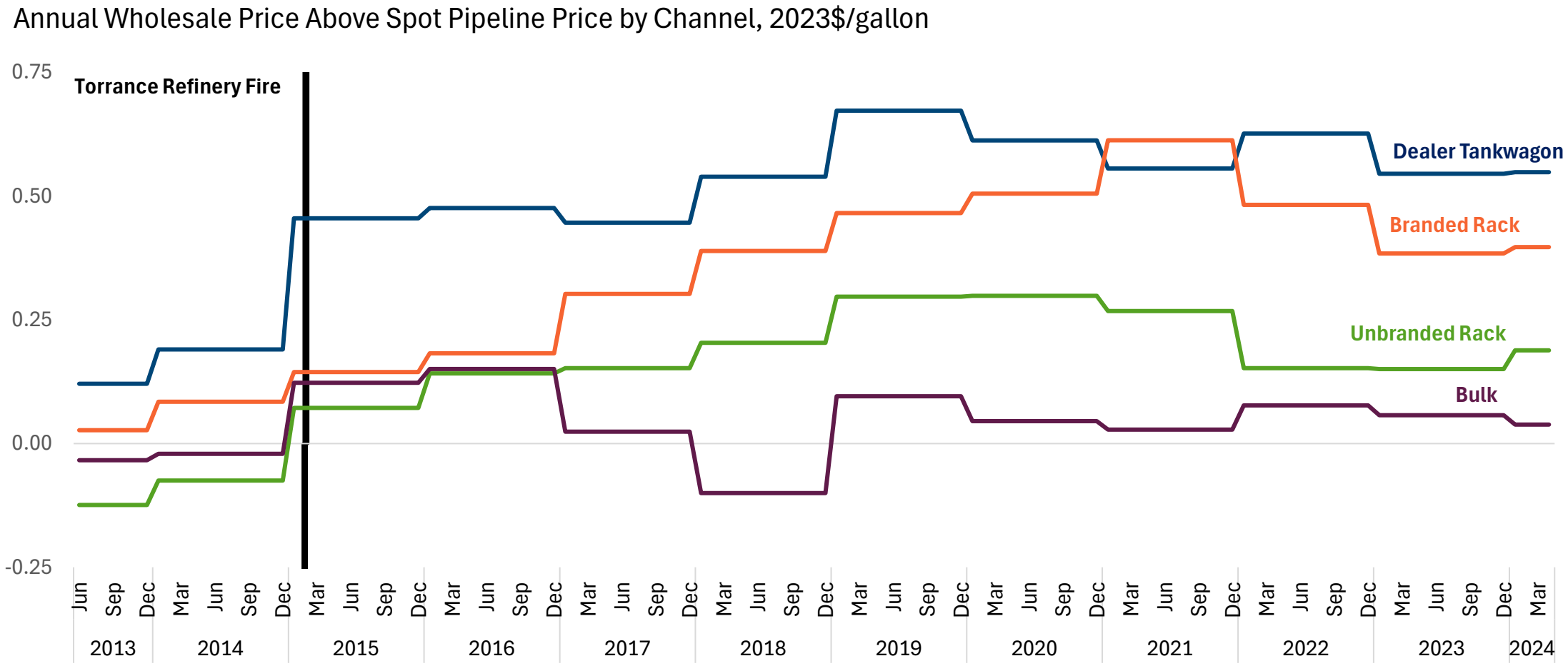
1. **Elevated price levels**
2. **Elevated industry margins**
3. **The role of market power**
4. **Price spikes and increasing branded markups:** In addition to spot market price spikes, branded prices are increasing. Retail gasoline sold at major brands has the highest MGS of $0.72 per gallon since 2015

Spot Market Price Spikes



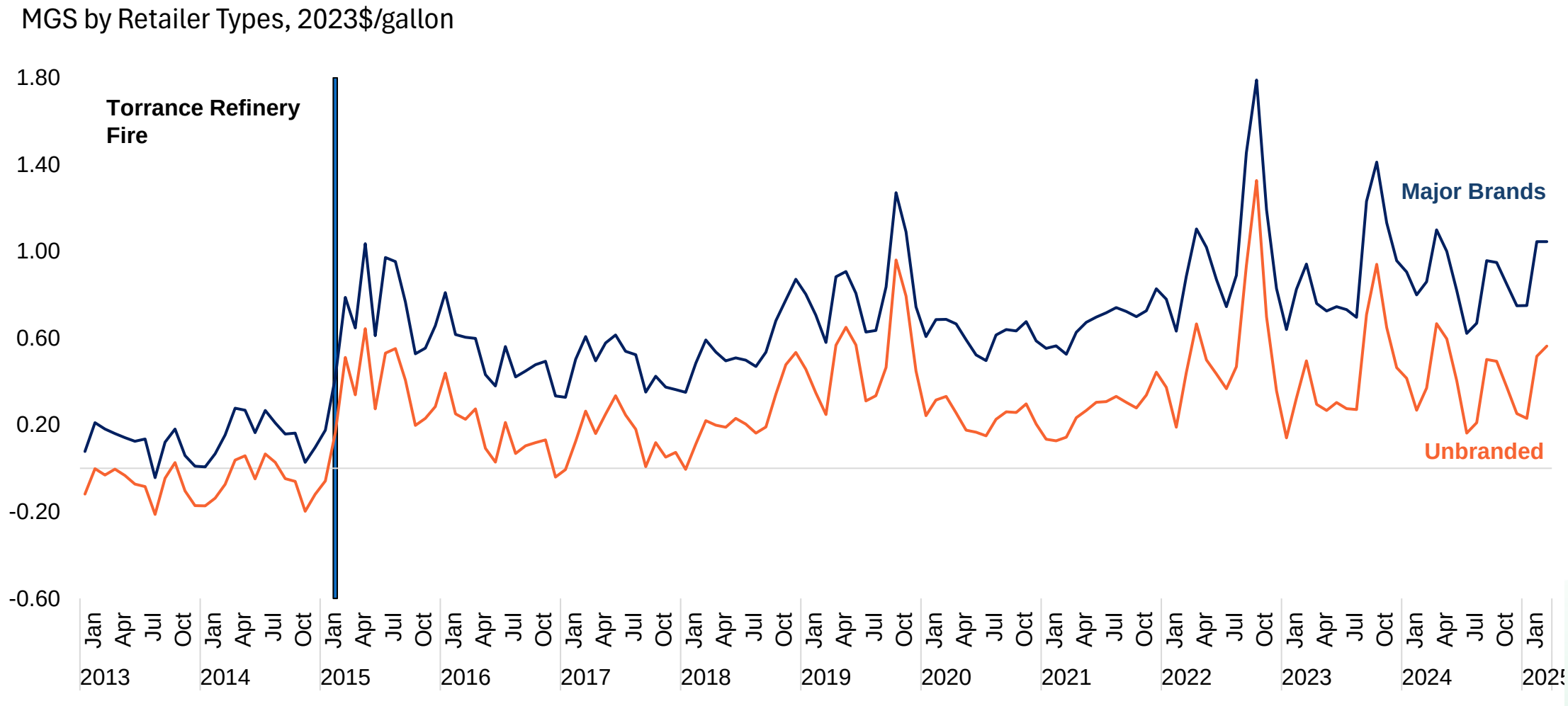
DPMO analysis of monthly spot prices from EIA and OPIS. California spot prices computed as the average of Los Angeles and San Francisco spot prices. Rest of U.S. spot prices computed as the average of New York and Gulf Coast spot prices.

Rising Branded Wholesale Prices



DPMO analysis of aggregated CEC Form M1322 industry data. Wholesale prices in this chart are reported by refiners and exclude taxes, fees, and environmental program costs. This analysis excludes sales through company outlets.

Rising Branded Retail Prices

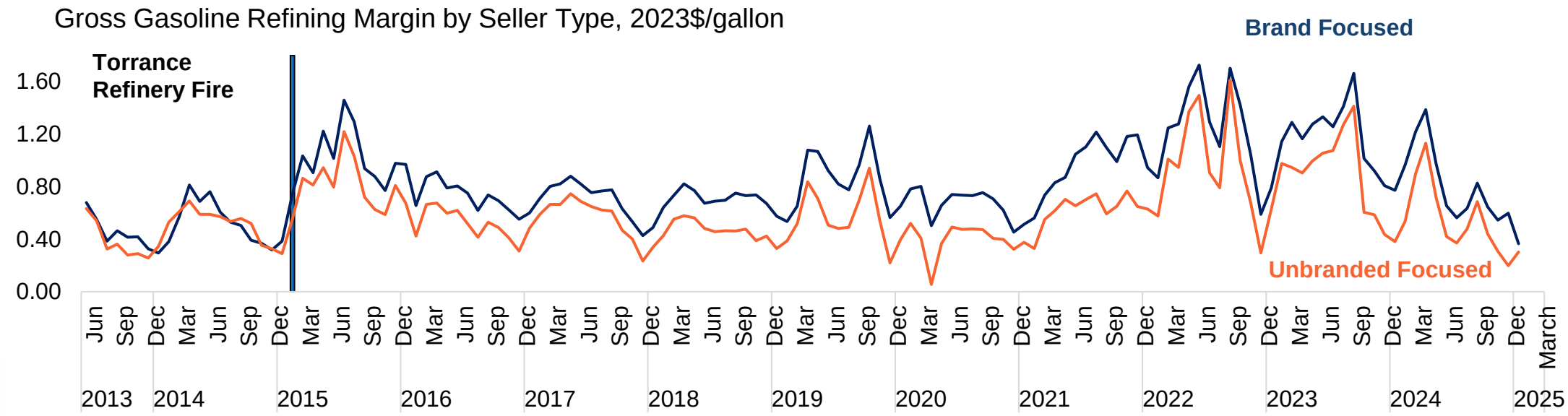


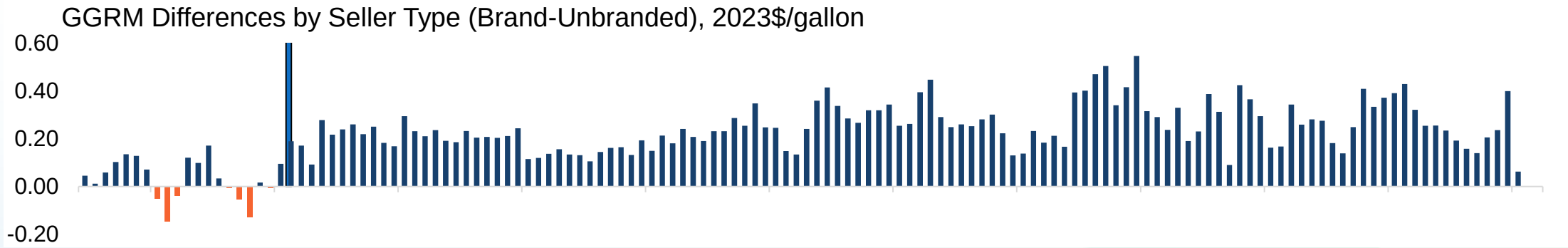
DPMO analysis of OPIS retail data. Major retail brands include Chevron, ExxonMobil, Shell, and 76.

What the Data Shows

1. **Elevated price levels**
2. **Elevated industry margins**
3. **The role of market power**
4. **Price spikes and increasing branded markups**
5. **Refining sector “haves” and “have nots”:** Outside of price spikes, large integrated refiners benefit from marketing/retail networks, while smaller non-integrated refiners are marginal

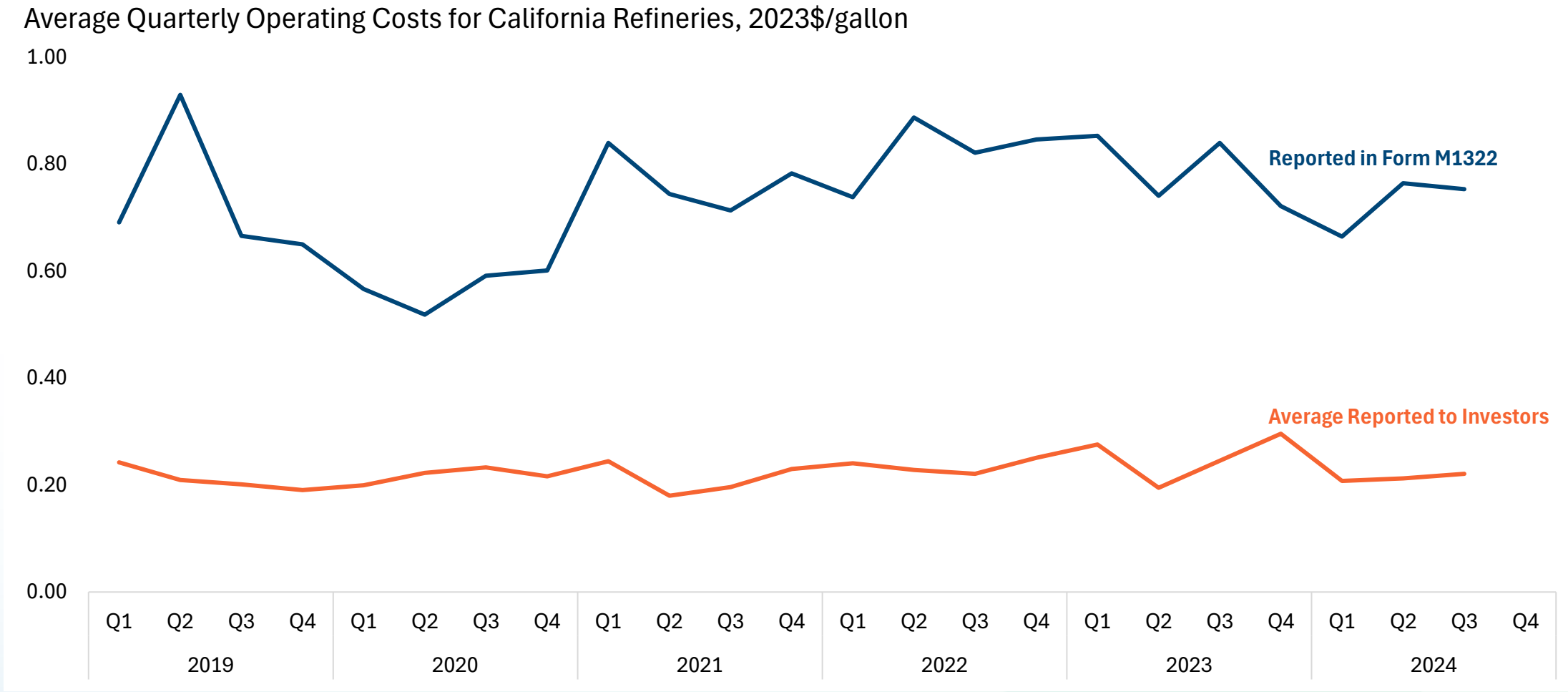
Refining “Haves” & “Have Nots”





Notes and Sources: DPMO analysis of CEC M1322 data. “Brand focused” refiners includes California refiners with more than 25 percent of wholesale volumes in the DTW and branded rack channels. “Unbranded focused” refiners are those with fewer than 25 percent of sales in DTW and branded rack channels.

Refining Operating Expenses

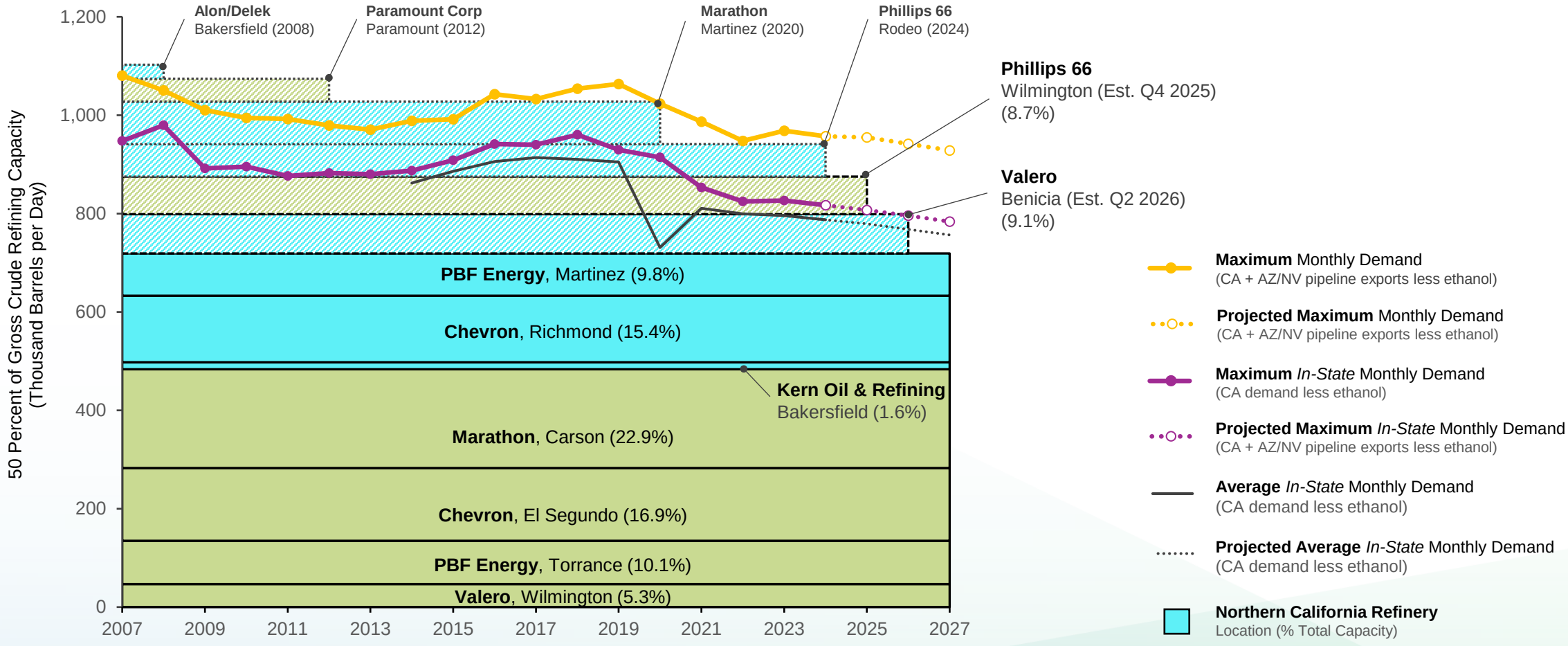


DPMO analysis of CEC M1322 data and quarterly earnings data reported to investors by California refiners. This chart only includes data for California refiners that report West Coast operating expenses and file 1322 data. Analysis excludes depreciation and amortization costs across both data series for consistency.

What the Data Shows

1. Elevated price levels
2. Elevated industry margins
3. The role of market power
4. Price spikes and increasing branded markups
5. Refining sector “haves” and “have nots”

Estimated Gasoline Refinery Capacity

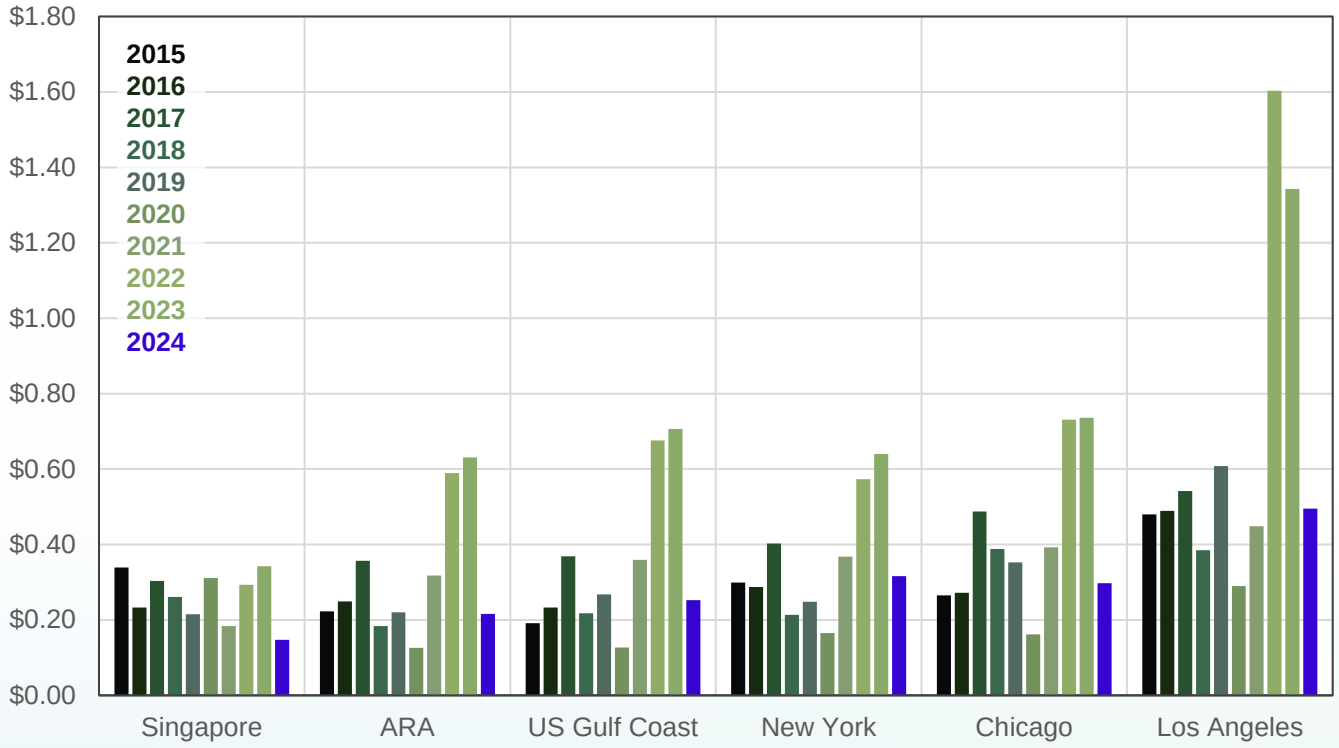


Source: CEC Staff, CDTFA

2024 Refining Margins Fall Globally

Regional September Gross Refining Margins (2015-2024)

Dollars per gallon



Source: Bloomberg

Lower Demand

- Slow economic activity in China and Europe
- Increased penetration of Electric Vehicles

Increased Petroleum Refining Capacity

- Al-Zour (Kuwait, 2024) 615,000 b/d
- Duqm (Oman, 2024) 230,000 b/d
- Dangote (Nigeria, 2023) 650,000 b/d
- Dos Bocas (Mexico, 2022) 340,000 b/d

Petroleum Refinery Closure Announcements

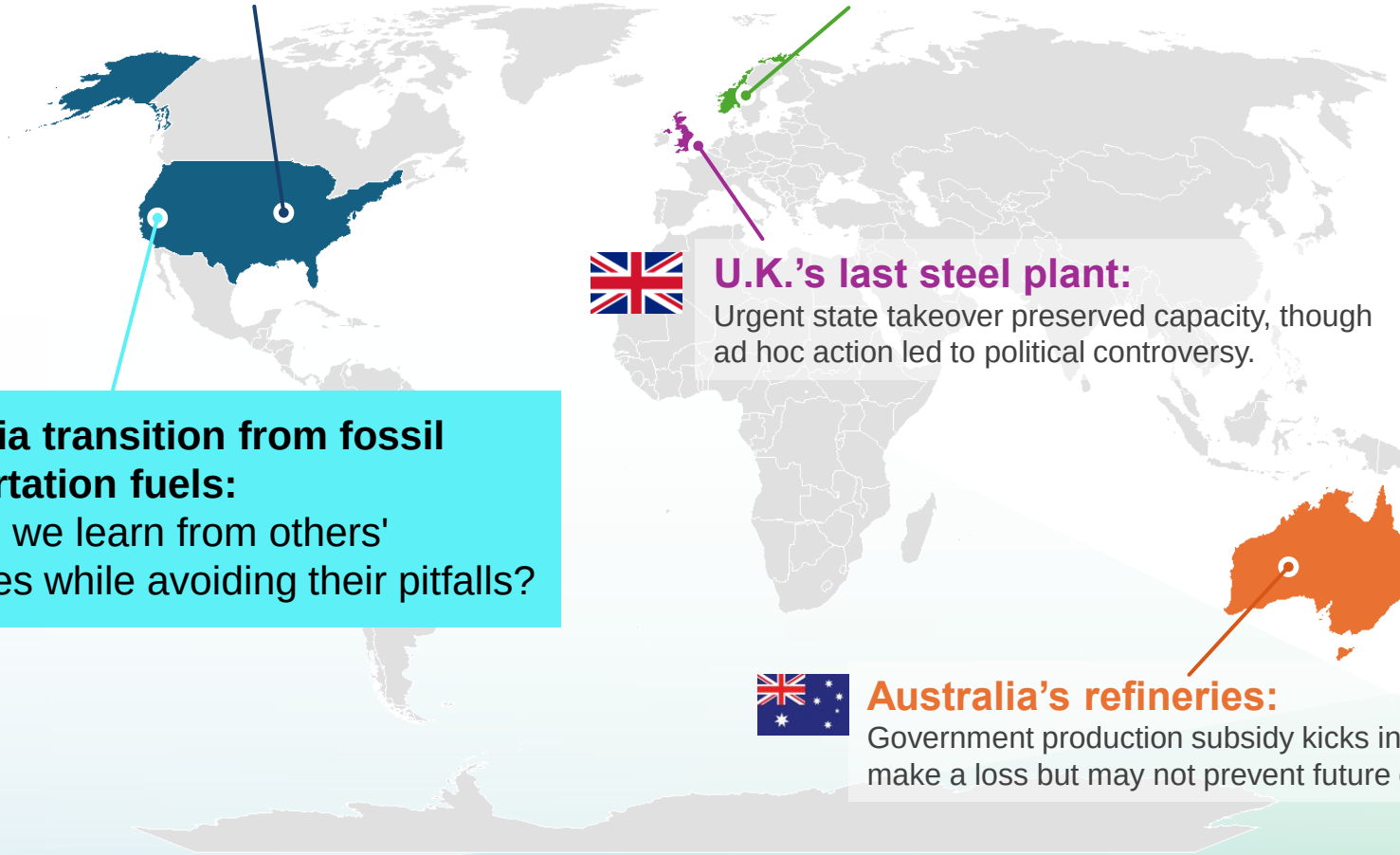
- Lyondell Basell closed its 264,000-b/d refinery in Houston, Texas, in first quarter of 2025 (one of the largest in North America)
- Expected refinery closures and conversions in Asia, Europe and in the US

b/d = barrels per day

Transitions Across the World – Lessons Learned

U.S. coal production:
Long-term demand declines have produced repeated bankruptcies and mass layoffs.

Norway's Equinor:
Majority state-owned oil company channels revenue to energy transition but depends on oil exports to do so.



U.K.'s last steel plant:
Urgent state takeover preserved capacity, though ad hoc action led to political controversy.

California transition from fossil transportation fuels:
How can we learn from others' successes while avoiding their pitfalls?

Australia's refineries:
Government production subsidy kicks in when refineries make a loss but may not prevent future exits.

Preliminary Contours of Approach
in consultation with impacted communities & stakeholders

1. Existing At-Risk Refinery Strategy

Based on current analysis, CEC thinks it is prudent to take steps to immediately stabilize in-state supply.

Maintain operations: Enact strategies for refineries needed to meet demand to be financially stable and run safely and responsibly.

2. Concurrent System-Wide Strategy

System-wide needs must be addressed in the near-term to protect consumers and to provide the investment confidence needed to safely meet demand while achieving climate goals and health protective standards.

Investment confidence: Industry-wide de-risking of premature exits and supporting safe, reliable operations.

- Ensure timely infrastructure for sufficient in-state refining capacity, imports, storage, and delivery of refined products.
- Stabilize California crude oil production and distribution to supply refineries while honoring federal and state law and transition strategy.
- Coordinate regulatory paradigms across levels of government towards these common goals.

3. Transition Strategy

Near- and medium-term actions must be part of a holistic transition strategy that is built on shared understanding, collaboration, and development of policies across state agencies and stakeholders.

Managed transition strategy:

- Support and protect California's authority to set emission standards and achieve climate goals.
- Further California's ability to diversify and evolve its transportation sector to comply with federal and state air quality standards and meet climate goals.
- Identify and pursue necessary transition funding to support climate, health, community, and worker priorities.
- Identify challenges, opportunities, and strategies for the future of land affected by the transition (e.g. remediation, marketability, and value).

Thank you!

Assembly Utilities and Energy Committee - Oversight Hearing

May 28, 2025