

PETROLEUM WATCH

CALIFORNIA ENERGY COMMISSION

INSIDE

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REFINERY NEWS

• Chevron Richmond:
On May 14, a fire broke out at the refinery in addition to a process unit upset that caused some emergency flaring ([Reuters](#)).

CALIFORNIA GASOLINE RETAIL PRICES BY BRAND

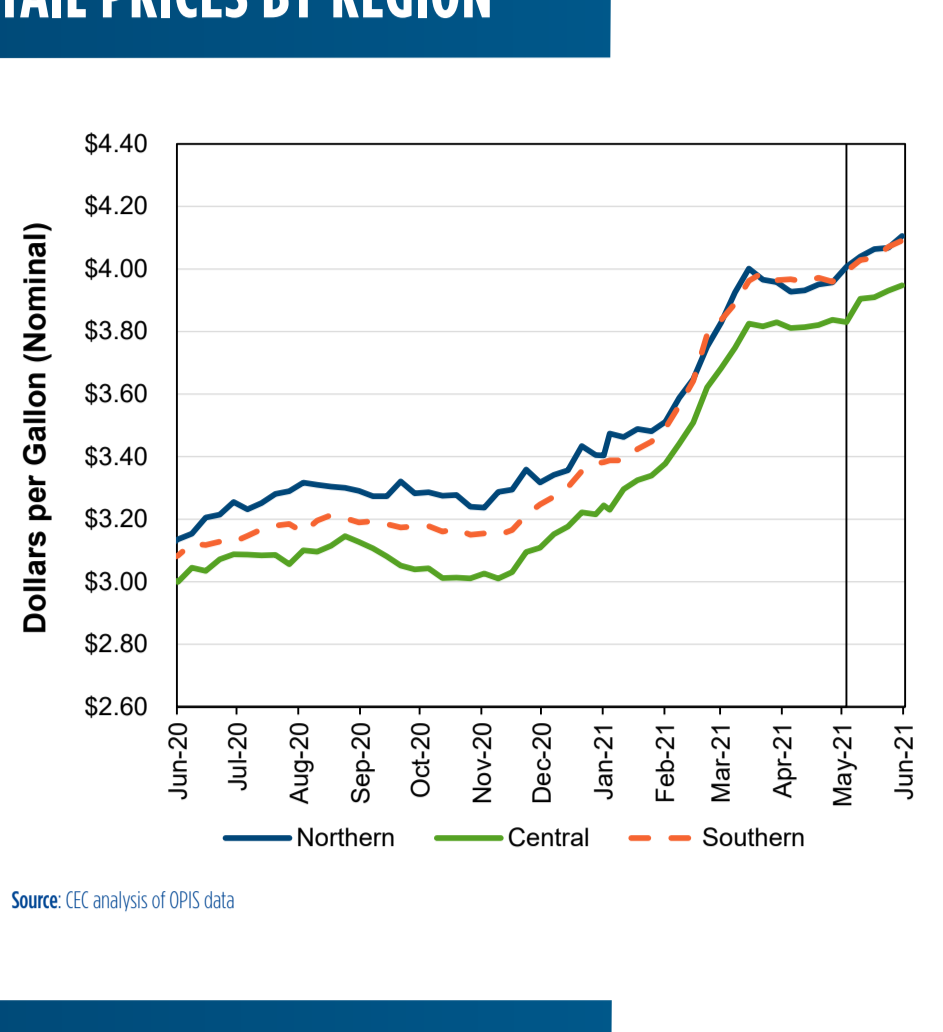
May 2021 vs. 2020

(Percentage Change)

| | |
|-----------|------------|
| 76 | 45% higher |
| ARCO | 52% higher |
| Chevron | 44% higher |
| Hypermart | 54% higher |
| Shell | 44% higher |
| Unbranded | 50% higher |
| Valero | 49% higher |

May 2021 Averages

| | |
|-----------|--------|
| 76 | \$4.21 |
| ARCO | \$3.94 |
| Chevron | \$4.32 |
| Hypermart | \$3.79 |
| Shell | \$4.25 |
| Unbranded | \$3.98 |
| Valero | \$4.10 |



Source: California Energy Commission (CEC) analysis of Oil Price Information Service (OPIS) data

CALIFORNIA DIESEL RETAIL PRICES BY REGION

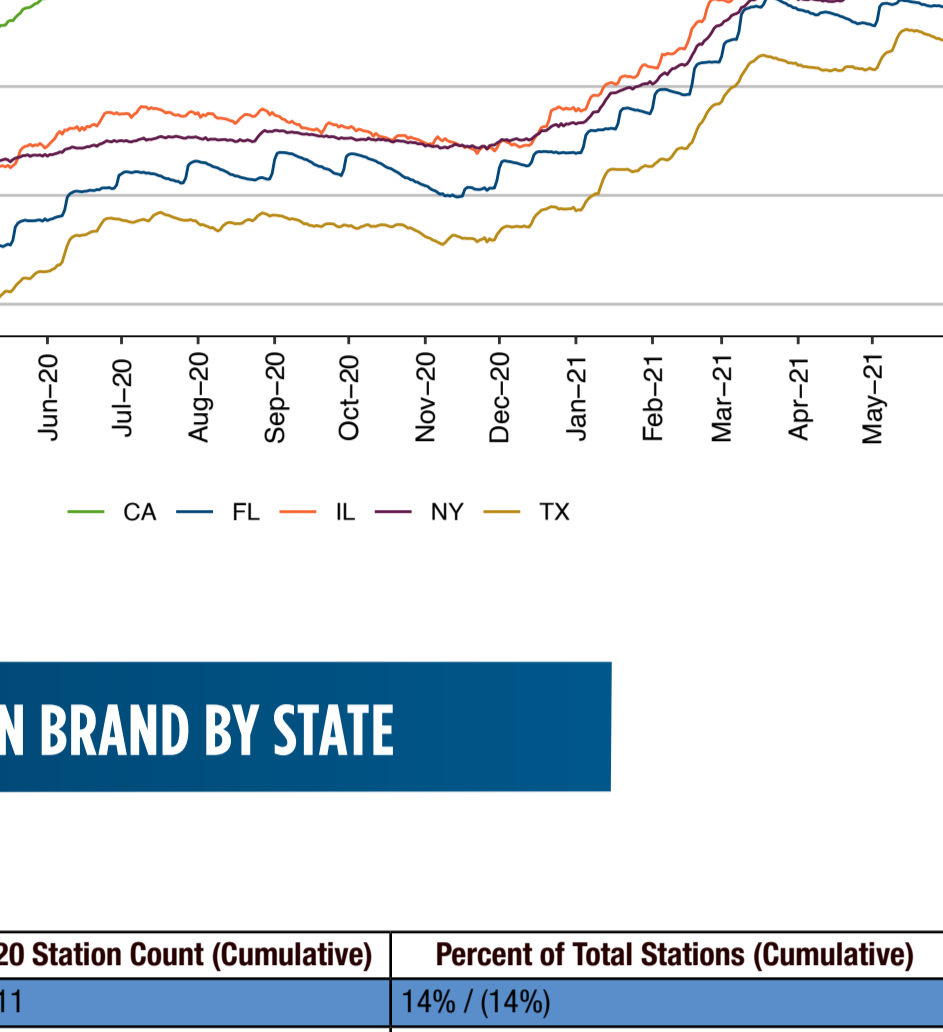
May 2021 vs. 2020

(Percentage Change)

| | |
|-------------|------------|
| Northern CA | 29% higher |
| Central CA | 30% higher |
| Southern CA | 32% higher |

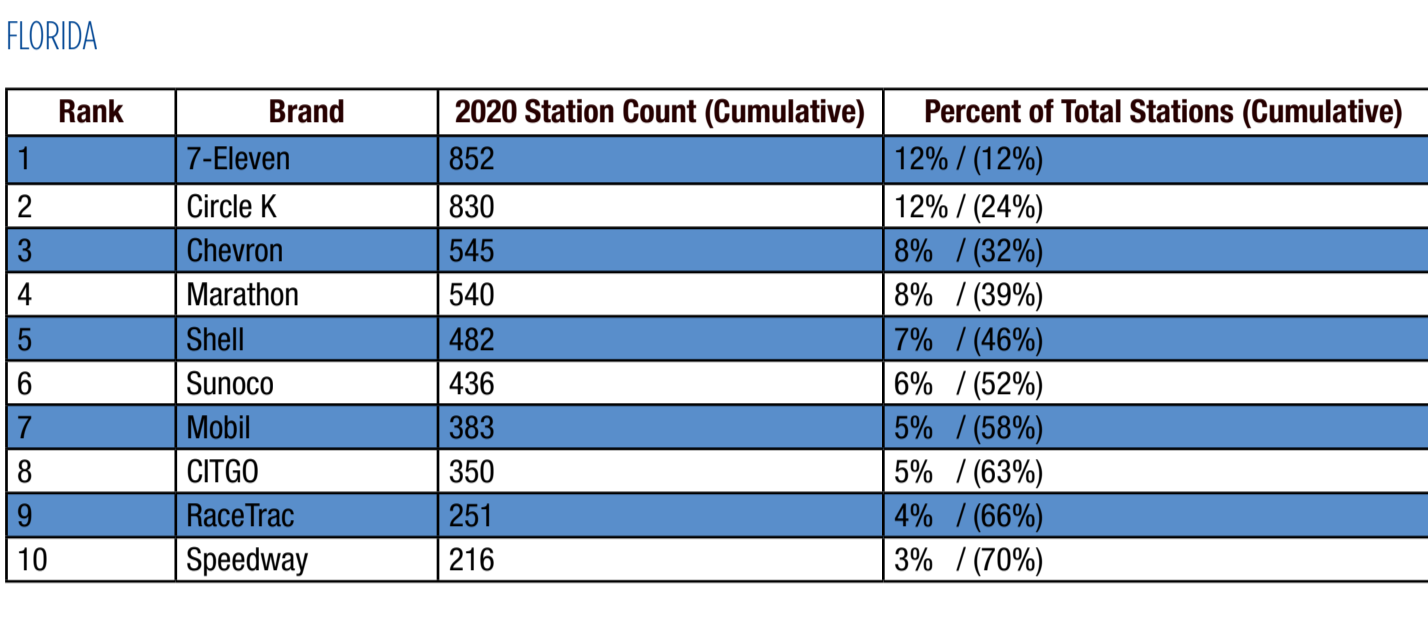
May 2021 Averages

| | |
|-------------|--------|
| Northern CA | \$4.05 |
| Central CA | \$3.89 |
| Southern CA | \$4.03 |



Source: CEC analysis of OPIS data

DAILY AVERAGE GASOLINE PRICES BY STATE



Source: CEC analysis of OPIS data

FREQUENCY COUNTS ON BRAND BY STATE

CALIFORNIA

| Rank | Brand | 2020 Station Count (Cumulative) | Percent of Total Stations (Cumulative) |
|------|--------------|---------------------------------|--|
| 1 | Chevron | 1,211 | 14% / (14%) |
| 2 | Shell | 1,061 | 12% / (26%) |
| 3 | ARCO | 990 | 11% / (38%) |
| 4 | 76 | 737 | 9% / (46%) |
| 5 | Valero | 518 | 6% / (52%) |
| 6 | Mobil | 432 | 5% / (57%) |
| 7 | ExtraMile* | 418 | 5% / (62%) |
| 8 | 7-Eleven | 375 | 4% / (66%) |
| 9 | Circle K | 277 | 3% / (70%) |
| 10 | USA Gasoline | 137 | 2% / (71%) |

FLORIDA

| Rank | Brand | 2020 Station Count (Cumulative) | Percent of Total Stations (Cumulative) |
|------|----------|---------------------------------|--|
| 1 | 7-Eleven | 852 | 12% / (12%) |
| 2 | Circle K | 830 | 12% / (24%) |
| 3 | Chevron | 545 | 8% / (32%) |
| 4 | Marathon | 540 | 8% / (39%) |
| 5 | Shell | 482 | 7% / (46%) |
| 6 | Sunoco | 436 | 6% / (52%) |
| 7 | Mobil | 383 | 5% / (58%) |
| 8 | CITGO | 350 | 5% / (63%) |
| 9 | RaceTrac | 251 | 4% / (66%) |
| 10 | Speedway | 216 | 3% / (70%) |

ILLINOIS

| Rank | Brand | 2020 Station Count (Cumulative) | Percent of Total Stations (Cumulative) |
|------|-------------|---------------------------------|--|
| 1 | BP | 484 | 12% / (12%) |
| 2 | Casey's | 446 | 11% / (23%) |
| 3 | Shell | 377 | 9% / (32%) |
| 4 | Circle K | 347 | 9% / (41%) |
| 5 | Mobil | 268 | 7% / (48%) |
| 6 | CITGO | 225 | 6% / (53%) |
| 7 | Marathon | 198 | 5% / (58%) |
| 8 | Speedway | 128 | 3% / (61%) |
| 9 | Fast Stop | 94 | 2% / (64%) |
| 10 | Phillips 66 | 94 | 2% / (66%) |

NEW YORK

| Rank | Brand | 2020 Station Count (Cumulative) | Percent of Total Stations (Cumulative) |
|------|--------------|---------------------------------|--|
| 1 | Sunoco | 616 | 13% / (13%) |
| 2 | Mobil | 489 | 10% / (23%) |
| 3 | BP | 382 | 8% / (31%) |
| 4 | Speedway | 320 | 7% / (38%) |
| 5 | Stewart's | 284 | 6% / (44%) |
| 6 | CITGO | 258 | 5% / (49%) |
| 7 | Gulf | 242 | 5% / (54%) |
| 8 | Shell | 211 | 4% / (59%) |
| 9 | Bolia Market | 173 | 4% / (63%) |
| 10 | Kwik Market | 161 | 3% / (66%) |

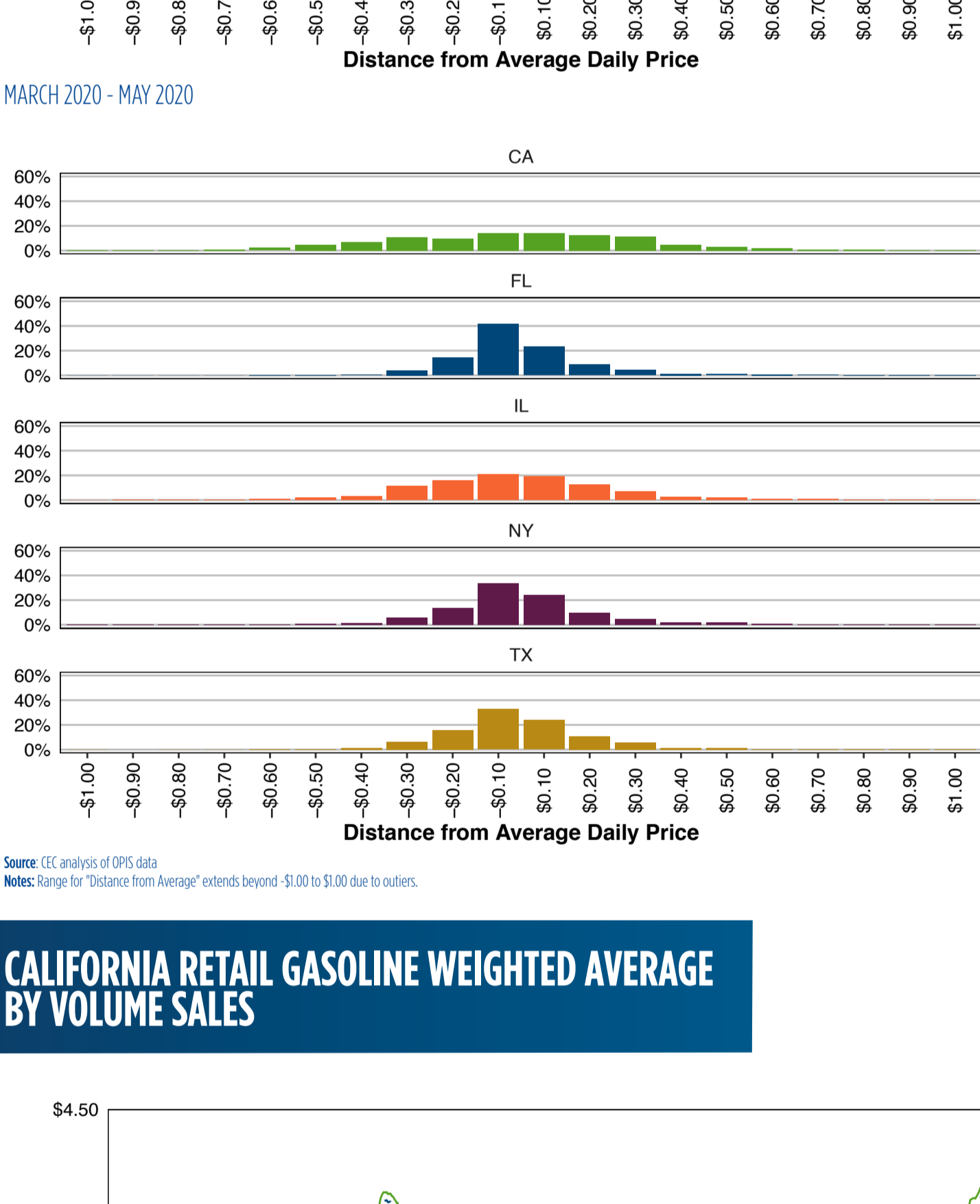
TEXAS

| Rank | Brand | 2020 Station Count (Cumulative) | Percent of Total Stations (Cumulative) |
|------|--------------|---------------------------------|--|
| 1 | Shell | 1,201 | 10% / (10%) |
| 2 | Exxon | 1,080 | 9% / (19%) |
| 3 | Chevron | 996 | 8% / (27%) |
| 4 | Valero | 944 | 8% / (35%) |
| 5 | 7-Eleven | 929 | 8% / (42%) |
| 6 | Stripes | 552 | 5% / (47%) |
| 7 | Circle K | 544 | 4% / (51%) |
| 8 | Texaco | 469 | 4% / (55%) |
| 9 | Corner Store | 301 | 2% / (58%) |
| 10 | Murphy USA | 261 | 2% / (60%) |

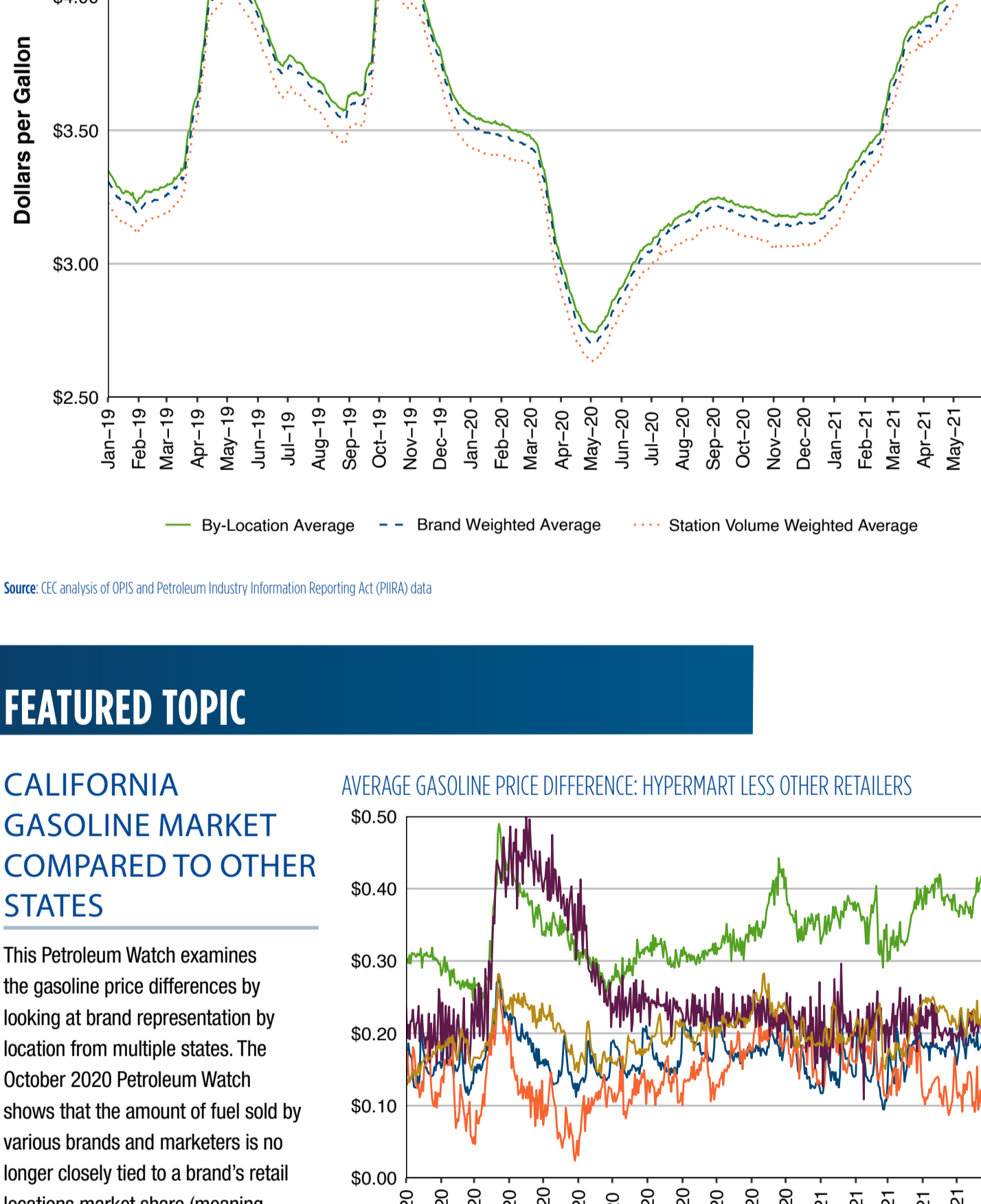
Source: CEC analysis of OPIS data
Notes: *ExtraMile is a Chevron owned mini-mart brand that sells Chevron fuel.

90-DAY DAILY PRICE HISTOGRAMS: CENTERED TO THE AVERAGE

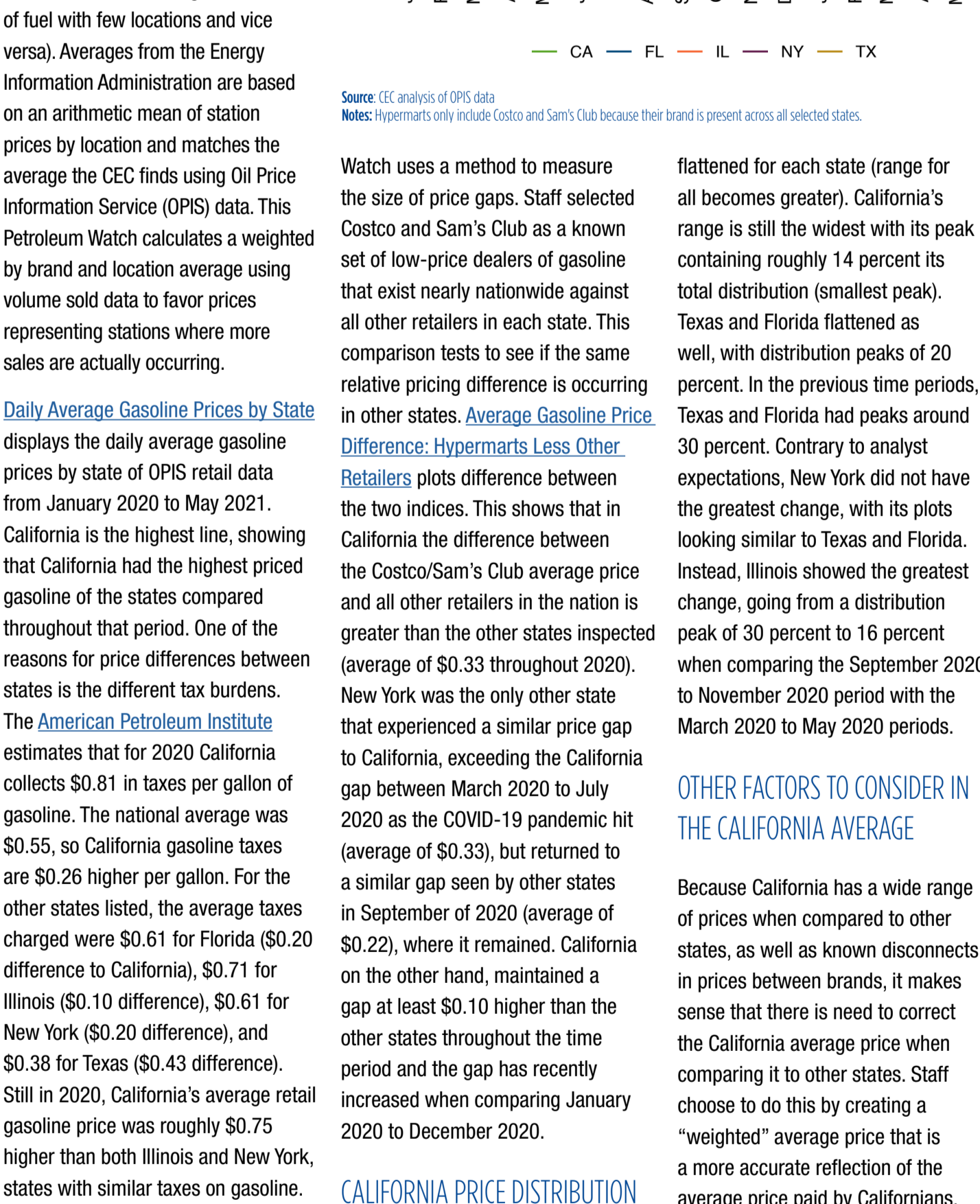
MARCH 2021 - MAY 2021



SEPTEMBER 2020 - NOVEMBER 2020

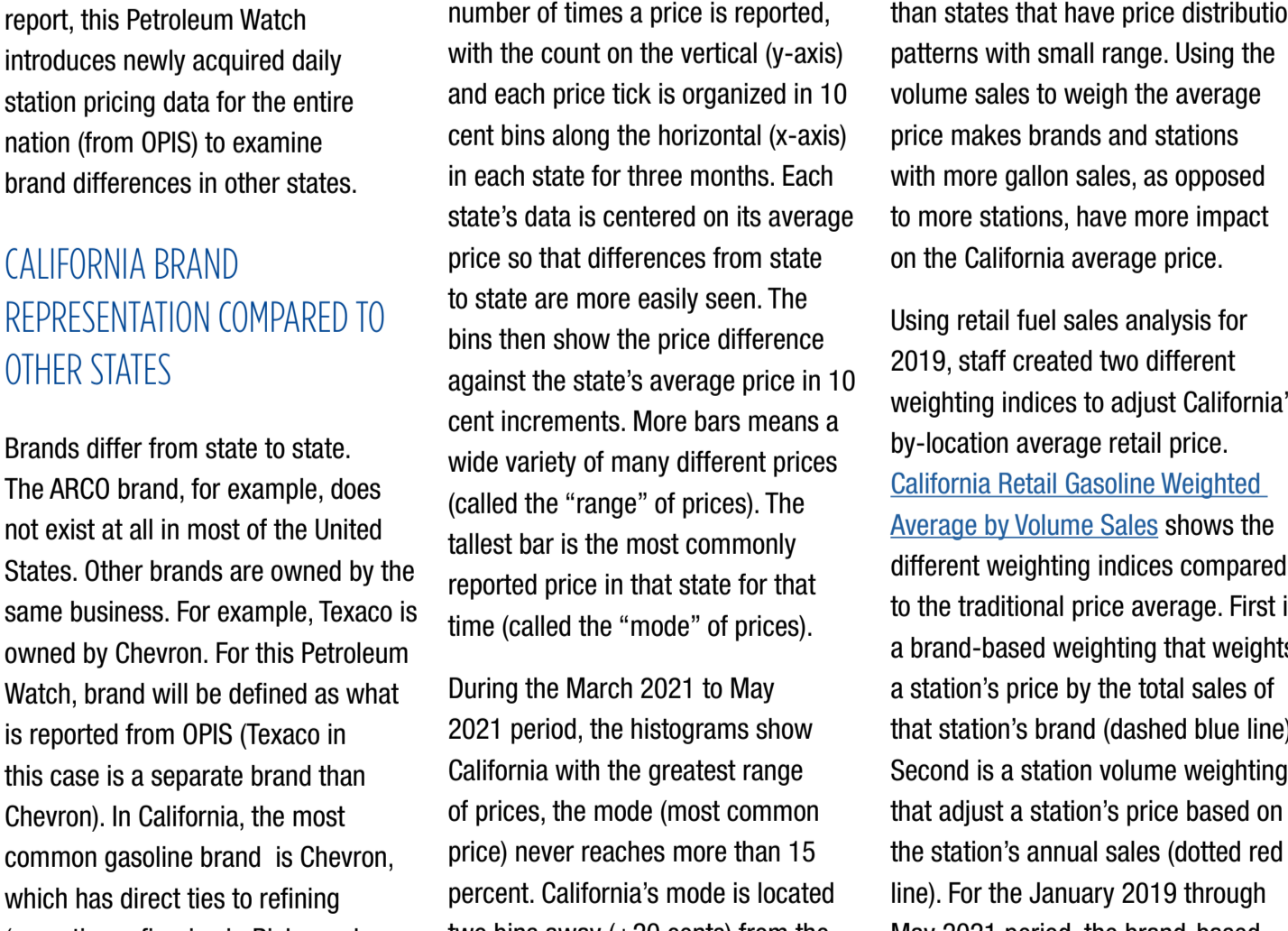


MARCH 2020 - MAY 2020



Source: CEC analysis of OPIS data
Notes: *Range for "Distance from Average" extends beyond -\$1.00 to \$1.00 due to outliers.

CALIFORNIA RETAIL GASOLINE WEIGHTED AVERAGE BY VOLUME SALES



Source: CEC analysis of OPIS and Petroleum Industry Information Reporting Act (PIIRA) data

FEATURED TOPIC

CALIFORNIA GASOLINE MARKET COMPARED TO OTHER STATES

This Petroleum Watch examines the gasoline price differences by looking at brand representation by location from multiple states. The October 2020 Petroleum Watch shows that the amount of fuel sold by various brands and marketers is no longer closely tied to a brand's retail locations market share (meaning some marketers sell large amounts of fuel with few locations and vice versa). Averages from the Energy Information Administration are based on an arithmetic mean of station prices by location and matches the average the CEC finds using Oil Price Information Service (OPIS) data. This Petroleum Watch calculates a weighted by-brand and location average using volume sold data to favor prices representing stations where more sales are actually occurring.

[Daily Average Gasoline Prices by State](#) displays the daily average gasoline prices by state of OPIS retail data from January 2020 to May 2021. California is the highest line, showing that California had the highest priced gasoline of the states compared throughout that period. One of the reasons for price differences between states is the different tax burdens. The [American Petroleum Institute](#) estimates that for 2020 California collects \$0.81 in taxes per gallon of gasoline. The national average was \$0.55, so California gasoline taxes are \$0.26 higher per gallon. For the other states listed, the average taxes charged were \$0.61 for Florida (\$0.20 difference to California), \$0.71 for Illinois (\$0.10 difference), \$0.61 for New York (\$0.20 difference), and \$0.38 for Texas (\$0.43 difference). Still in 2020, California's average retail gasoline price was roughly \$0.75 higher than both Illinois and New York, states with similar taxes on gasoline.

In the [CEC 2019 report to the Governor](#), staff identified that some gasoline retailers in California were charging more than their traditional margins and more than their competitors, which accounted for some of the above described difference between California and other states. This report, this Petroleum Watch introduces newly acquired daily station pricing data for the entire nation (from OPIS) to examine brand differences in other states.

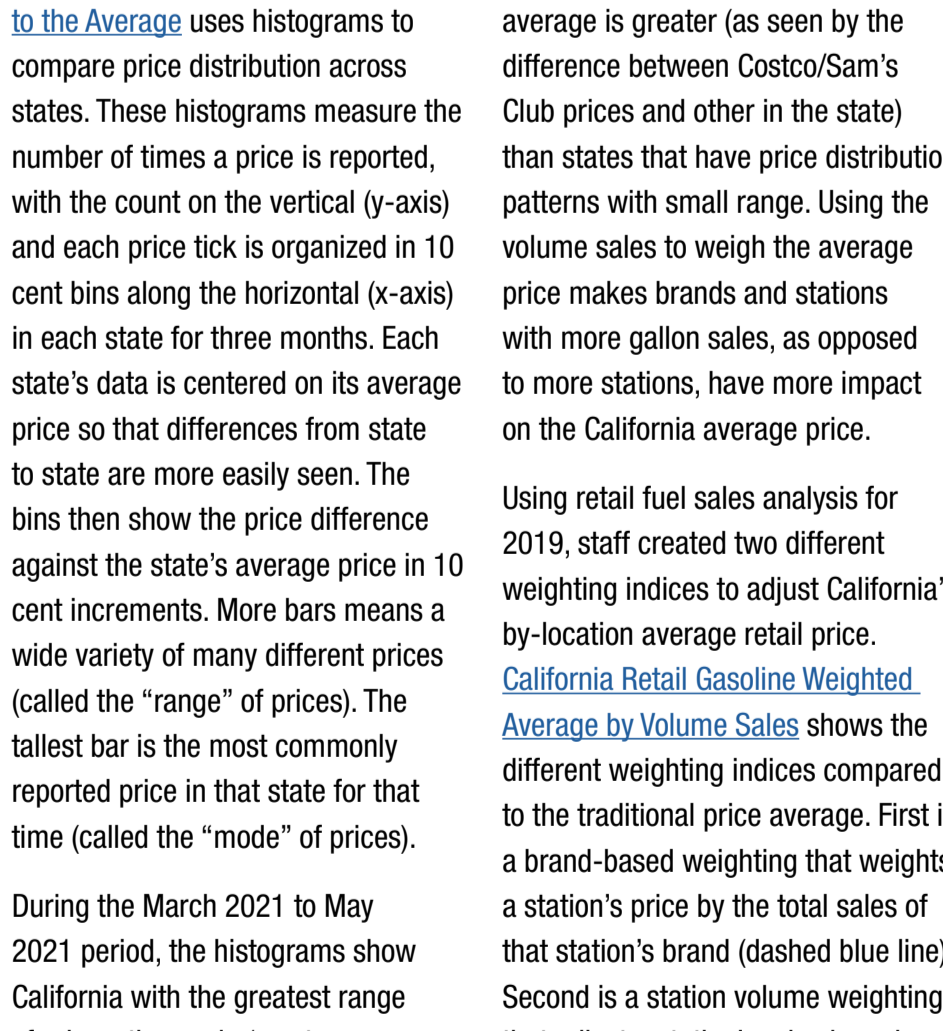
CALIFORNIA BRAND REPRESENTATION COMPARED TO OTHER STATES

Brands differ from state to state. The ARCO brand, for example, does not exist at all in most of the United States. Other brands are owned by the same business. For example, Texaco is owned by Chevron. For this Petroleum Watch, brand will be defined as what is reported from OPIS (Texaco in this case is a separate brand than Chevron). In California, the most common gasoline brand is Chevron, which has direct ties to refining (operating refineries in Richmond and El Segundo) and oil extraction operations. Shell, Arco, 76, and Valero also have direct ties to refining and oil extraction operations. In Florida, the top two most common dealers of gasoline by station count are 7-Eleven and Circle K. In Illinois, BP is the most common brand (a brand with clear refining ties), but the second most common brand is Casey's. Of the states inspected for this study, Texas and New York looked the most similar to California's brand composition. But in Texas and New York, non-refining linked brands appeared higher in the Top-10 (Stewarts for New York and 7-Eleven for Texas at rank 5 each) than in California where the most common non-refining dealer (7-Eleven) is no higher than rank 8.

Chevron ranks first in California by number of locations, forming 14 percent of retail stations. By percentage, this is the largest share of any state's fueling locations reported by OPIS, indicating that California has a higher brand concentration for its most common retailer (by location count). Chevron's location counts are even higher as the ExtraMile brand is a Chevron-owned mini-mart "brand" that sells Chevron fuel, adding another 5 percent to Chevron's share and increasing the share of retail locations in California to 19 percent. When combined by frequency count, California's Top-10 brands form a higher concentration of total stations than any of the other states shown. This is seen in the total percentage row in [Frequency Counts on Brand by State Table](#), with the Top-10 in California forming 71 percent of total stations count. Florida was the only location that had a similar percentage to California, at 70 percent, but 7-Eleven's 12 percent share of Florida's locations is less than Chevron's 14 percent and other refining related brands in the Top-10.

Since each state's brand marketing is noticeably different, this Petroleum

AVERAGE GASOLINE PRICE DIFFERENCE: HYPERMART LESS OTHER RETAILERS



Source: CEC analysis of OPIS data
Notes: Hypermarts only include Costco and Sam's Club because their brand is present across all selected states.

We watch a method to measure the size of price gaps. Staff selected Costco and Sam's Club as a known set of low-price dealers of gasoline that exist nearly nationwide against all other retailers in each state. This comparison tests to see if the same relative pricing difference is occurring in other states. [Average Gasoline Price Difference: Hypermarts Less Other Retailers](#) plots difference between the two indices. This shows that in California the difference between the Costco/Sam's Club average price and all other retailers in the nation is greater than the other states inspected (average of \$0.33) but returned to \$0.22, where it remained. California on the other hand, maintained a gap at least \$0.10 higher than the other states throughout the time period and the gap has recently increased when comparing January 2020 to December 2020.

CALIFORNIA PRICE DISTRIBUTION COMPARED TO OTHER STATES

California has a wide distribution of prices, and as noticeable price gaps can be seen based on the brand. [90-Day Daily Price Histograms: Centered to the Average](#) uses histograms to compare price distribution across states. These histograms measure the number of times a price is reported, with the count on the vertical (y-axis) and each price tick is organized in 10 cent bins along the horizontal (x-axis) in each state for three months. Each state's data is centered on its average price so that differences from state to state are more easily seen. The bins then show the price difference against the state's average price in 10 cent increments. More bars means a wide variety of many different prices (called the "range" of prices). The tallest bar is the most commonly reported price for that time (called the "mode" of prices).

During the March 2021 to May 2021 period, the histograms show California with the greatest range of prices, the mode (most common price) never reaches more than 15 percent. California's mode is located two bins away (+20 cents) from the average price. This means there are more stations charging prices higher than the average price in California, Florida, Illinois, and Texas. All show much higher modes, each state higher than 30 percent just to the left of the average. This bell-curve shape means most of the prices in other states tend to clump around the average. Florida's mode for both periods are over 30 percent, which is twice as high as California's mode. Illinois and Texas also had distribution peaks of roughly 30 percent throughout the September 2020 to November 2020. In the March 2021 to May 2021 period, Texas maintains that peak height while Illinois falls to just over 20 percent, but still have tighter distributions (smaller range) than California. In both of these periods, New York's distribution falls in line with those seen by other states excluding California.

Distribution peak concentration for New York was roughly 30 percent of observed prices for the March 2021 to May 2021 and September 2020 to November 2020 periods.

Returning to the [Average Gasoline Price Difference: Hypermarts Less Other Retailers](#), that shows the difference between Costco/Sam's Club gasoline prices versus all other prices within a state (Figure 4), all states show increases in their gaps in the March 2020 to May 2020 period as the COVID-19 became more prevalent. Based on results from Figures 5 and 6, if price gaps could be identified by wide distribution of prices, one may assume that distributions during that period would flatten for all the states. The larger price difference between Costco/Sam's Club in California and New York suggests that those states would have the lowest peak (smallest mode) and widest distribution (greater range) because they have largest price difference during those times.

When compared to the other periods, the March 2020 to May 2020 period shows that all distributions

flattened for each state (range for all becomes greater). California's range is still the widest with its peak containing roughly 14 percent its total distribution (smallest peak). Texas and Florida flattened as well, with distribution peaks of 20 percent. In the previous time periods, Texas and Florida had peaks around 30 percent. Contrary to analyst expectations, New York did not have the greatest change, with its plots looking similar to Texas and Florida. Instead, Illinois showed the greatest change, going from a distribution peak of 30 percent to 16 percent when comparing the September 2020 to November 2020 period with the March 2020 to May 2020 periods.

OTHER FACTORS TO CONSIDER IN THE CALIFORNIA AVERAGE

Because California has a wide range of prices when compared to other states, as well as known disconnects in prices between brands, it makes sense that there is need to correct the California average price when comparing it to other states. Staff chose to do this by creating a "weighted" average price that is a more accurate reflection of the average price paid by Californians, which relies on the volume of gasoline purchased. California with its wider price distribution pattern (see histograms), the possibility of having a price point as the by-location average is greater (as seen by the difference between Costco/Sam's Club prices and other in the state) than states that have price distributing patterns with small range. Using the volume sales to weigh the average price makes brands and stations with more gallon sales, as opposed to more stations, have more impact on the California average price.

Using retail fuel created two different weighting indices to adjust California's by-location average retail price. [California Retail Gasoline Weighted Average by Volume Sales](#) shows the different weighting indices compared to the traditional price average. First is a brand-based weighting that weights a station's price by the total sales of that station's brand (dashed blue line). Second is a station volume weighting that adjust a station's price based on the station's annual sales (dotted red line). For the January 2019 through May 2021 period, the brand-based weighting lowers the average price Californians pay by an average of \$0.04. The station-based weighting adjusted the average price even more, lowering the average by \$0.10 when compared to the by-location average. Both of these downward movements indicate that higher priced retailers are over-represented in a by-location price average. Californians are buying less gasoline from high-priced retailers even though higher priced retailers have gained a larger share of the locations. In the October 2020 Petroleum Watch, Hypermarts showed a 7 percent increase in market share (by volume) between 2009 and 2019. Additionally, it means that any by-location average for California is likely skewed higher when compared to other states.

CONCLUSION

California retail gasoline market appears different than the rest of the nation as its station price distribution is flatter than other inspected states. The price gap in California between low priced retailers (Costco/Sam's Club) and other gasoline retailers is also larger than the other compared states. This makes any by-location average price calculations for California skewed towards a higher price point as higher priced retailers tend to form a higher percent of stations within California than other locations inspected. Initial corrections for this skewing, by weighting the price by volume sold, lowers the average price Californians pay by roughly \$0.10 below the straight by-location average price. Further work is needed to inspect California prices to see if this flattened distribution of prices occurring in the state is a new phenomenon or if it is related to increases in the retail margin observed in the [2019 report to the Governor](#).