PETROLEUM WATCH
California Energy Commission
November 2017

Recent Petroleum News and Outside Analyses

Prices

- **Crude Oil Prices:** Brent and West Texas Intermediate crude prices closed at $60.65 and $54.11, respectively, on October 30 (**page 2**).
- **California Retail Gasoline Prices:** On the week of October 30, prices dropped to $3.07, a decrease of $0.08 since the end of September. Through October, California prices averaged $0.58 higher than the national average (**page 4**).
- **California Retail Diesel Prices:** On the week of October 30, prices reached $3.19, an increase of $0.01 from the end of September. Through October, California prices averaged $0.38 higher than the national average (**page 5**).

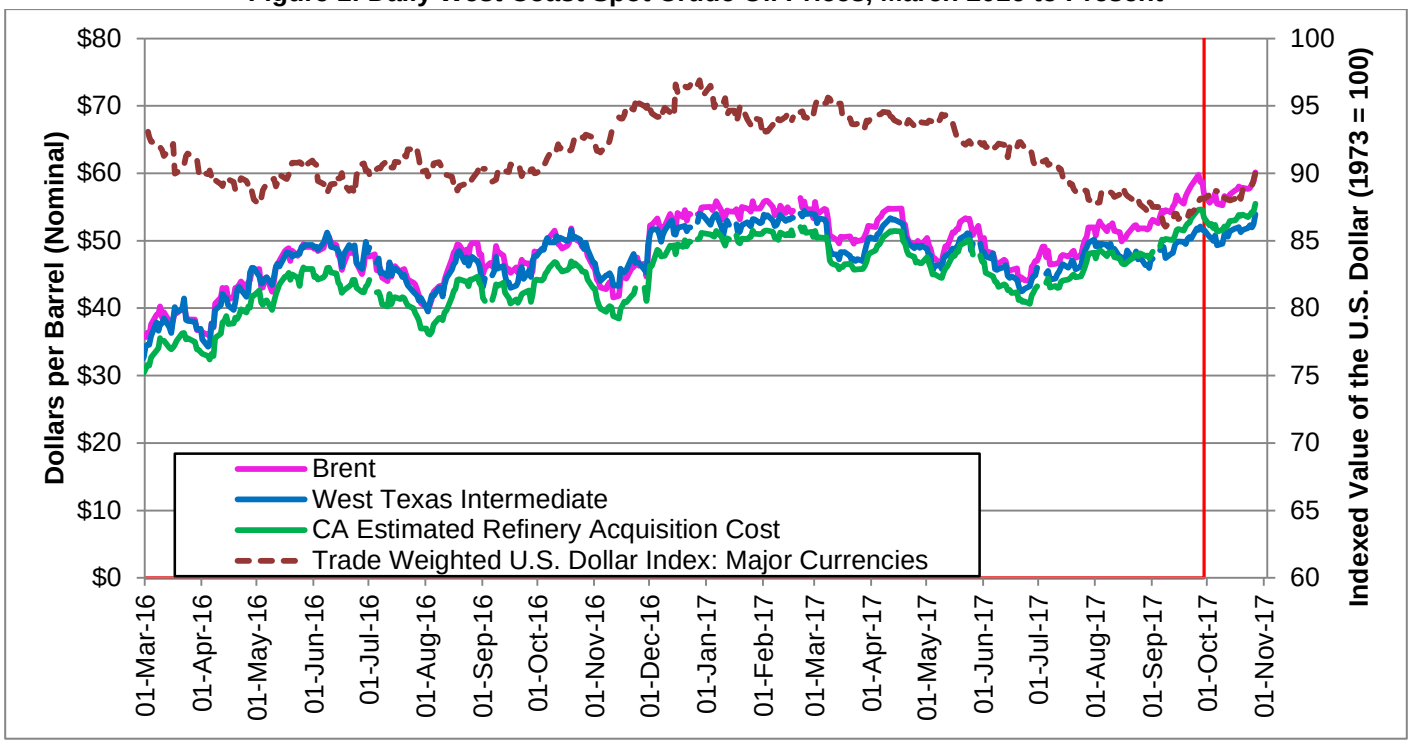
Refining News

- **Chevron El Segundo Refinery:** On October 5, planned maintenance began on multiple units, including a main atmospheric distillation unit, reformer, hydrotreater, and delayed coker units. Unplanned repairs brought an alkylation unit down on October 19 until work was completed October 28.
- **Chevron Richmond Refinery:** On October 15, a power interruption forced a fluid catalytic cracker unit offline and reduced production from an alkylation unit until October 17. Additional unplanned maintenance began on a reformer unit from October 30 to November 4.
- **PBF Torrance Refinery:** On October 27, a small fire broke out from leaks on a hydrogen line connection to a hydrotreater unit at the refinery. Workers put out the fire and completed damage assessments by October 28
- **Phillips 66 Wilmington Refinery:** On October 3, unplanned maintenance shut down a reformer unit until October 4, and a reformer feed hydrotreater unit until October 15. Planned maintenance required shutdown of a gas oil hydrotreater unit from October 14 until November 4.

Product of the Energy Assessments Division's Supply Analysis Office.

Crude Oil Prices

Figure 1: Daily West Coast Spot Crude Oil Prices, March 2016 to Present



Source: U.S. Energy Information Administration (EIA), Oil Price Information Service (OPIS), and Federal Reserve Bank of St. Louis.
Note: Red lines on all graphs indicate end of previous *Petroleum Watch* data. Areas to the right indicate new data since last month.

Crude oil spot prices increased in October and set new highs for 2017 (**Figure 1**). Brent began October at $55.67, decreased to $55.29 on October 9, and reached $60.65 on October 30, the highest price since July 2015. West Texas Intermediate (WTI) started October at $50.59, decreased to $49.34 on October 6, and finished at $54.11 on October 30, the highest WTI price since February 2017. The California Estimated Refiner Acquisition Cost (CA-RAC)[1] rose from $51.40 on October 6 to $56.00 on October 30, also reaching the highest level since July 2015.

On October 23, the Saudi Arabian energy minister announced the Saudis' intention to extend Organization of Petroleum Exporting Countries (OPEC) supply cuts beyond March 2018. The cuts are intended to reduce global oil stockpiles and raise prices. The news caused the Brent price to increase 1.05 percent, or $0.61, to $58.45 on October 25. This was the largest one-day increase since September 25, when Kuwait's energy minister made similar comments at another OPEC meeting.

The spread between WTI and Brent crude oil shrank since October's *Petroleum Watch*. The spread averaged $6.50 in September but shrank to $5.88 in October. Gulf Coast refineries have an increased their appetite for WTI, due to the recovery from Hurricane Harvey. This expanding demand has tightened the market for WTI.

Crude Oil Prices

October 2017 vs 2016
(Percent Change)

Brent	**16% higher**
WTI	**3% higher**
CA-RAC	**17% higher**

October 2017 Averages

Brent	**$57.32**
WTI	**$51.45**
CA-RAC	**$53.18**

October 30, 2017

Brent	**$60.65**
WTI	**$54.11**
CA-RAC	**$56.00**

1 California estimated refiner acquisition cost (CA-RAC) is a weighted average of the prices of California (San Joaquin Valley) crude, Alaskan crude, and foreign crude.

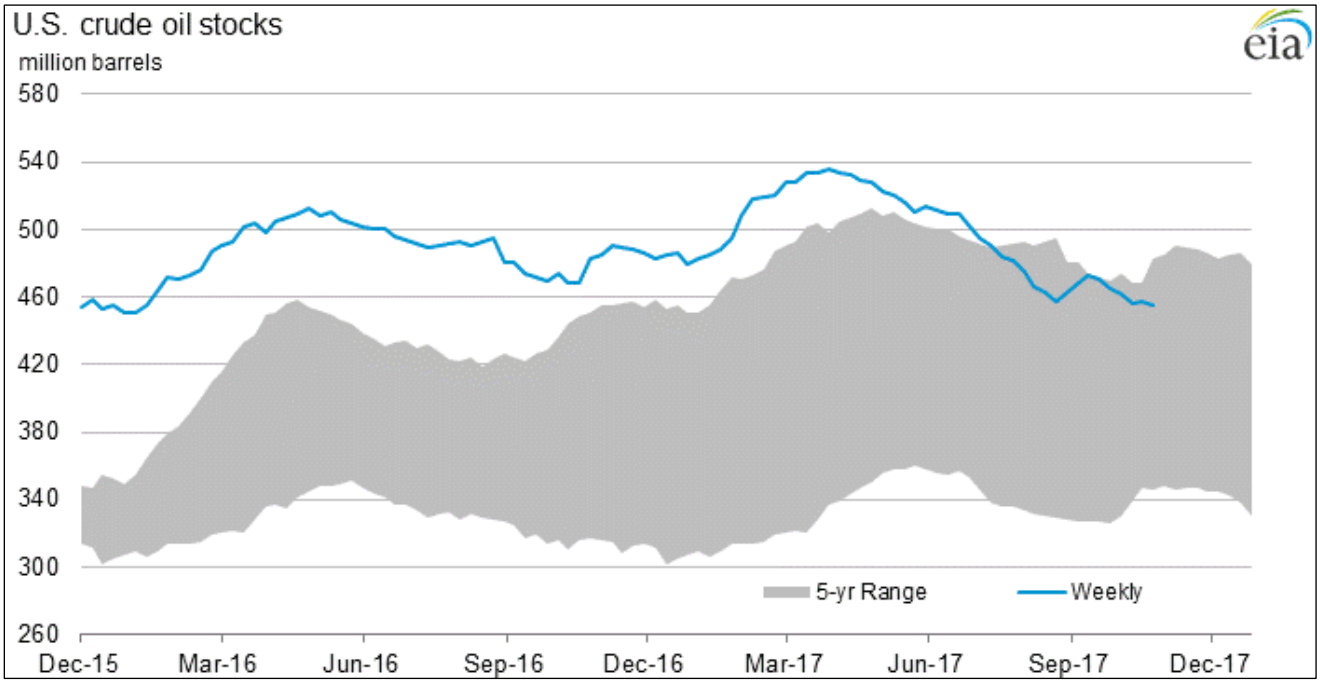
Crude Oil Production and Storage

Monthly refinery input and import levels increased, while crude oil production and inventories decreased since October's *Petroleum Watch* (**Figure 2**).

- U.S. crude oil production for October was estimated at 9.24 million barrel per day (bpd), 260,000 bpd lower than September's monthly average of 9.49 million bpd. This is a 750,000 bpd increase from a year ago, when production levels were 8.49 million bpd.
- Crude oil imports increased 550,000 bpd to 7.7 million bpd in September. When compared to import levels from October 2016, this is an increase of 40,000 bpd.
- U.S. crude oil refinery increased by 530,000 bpd since September's *Petroleum Watch*, finishing October at an average 15.9 million bpd. Refinery inputs are 450,000 bpd higher than year-ago levels.
- Crude oil inventories in the United States decreased by 1.1 million barrels during September to 455 million barrels. Current inventories are 27.7 million barrels lower than one year ago.

Refineries in the U.S. Gulf Coast have recovered most of the refining capacity lost in Hurricanes Harvey and Irma. Gulf Coast weekly refinery utilization improved to 90.4 percent on October 27 in line with historical utilization rates for the season. The year-over-year increases in crude production and imports show how domestic supply is stretching to meet demand. The decrease in crude oil inventories as well as increasing refinery inputs indicates demand growth over 2016.

Figure 2: U.S. Crude Oil Inventories, December 2015 to Present



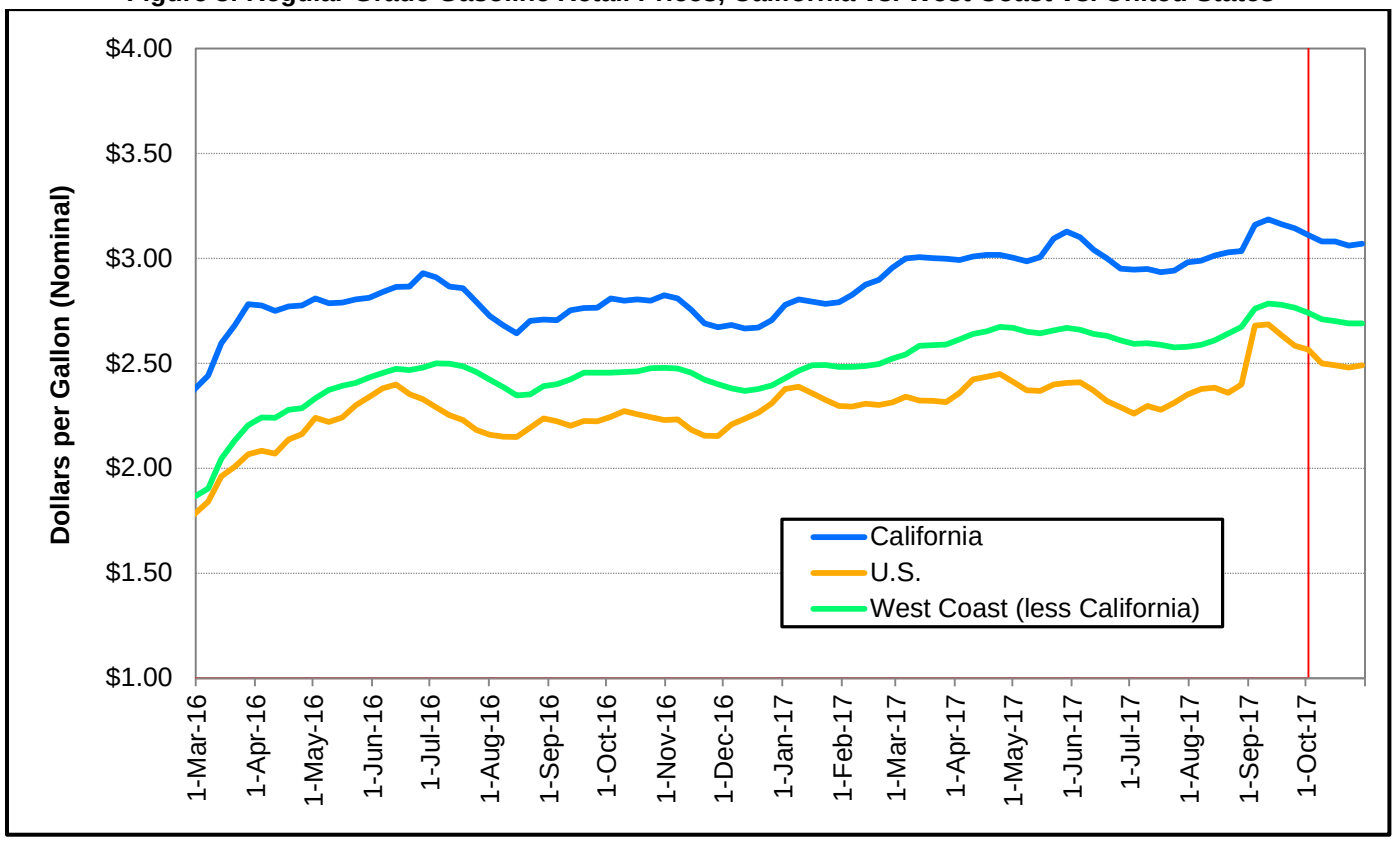
Source: U.S. EIA

- According to the OPEC's October *Monthly Oil Market Report*, total August OPEC production increased by 88,500 bpd to 32.7 million bpd. OPEC's target production set in November 2016 is 32.5 million bpd. OPEC increased its supply-and-demand balance forecast to 0.6 million bpd, 0.1 million bpd higher than the forecast reported in the previous *OPEC Monthly Oil Market Report*.[2]

2 *OPEC October Monthly Oil Monthly Report*, page i, page 58:
http://www.opec.org/opec_web/static_files_project/media/downloads/publications/MOMR%20October%202017.pdf.

Gasoline and Diesel Retail Prices

Figure 3: Regular Grade Gasoline Retail Prices, California vs. West Coast vs. United States



Source: U.S. EIA

Gasoline retail prices saw a steady decline until October 9 and remained flat through the end of the month (**Figure 3**). Gasoline retail prices saw the largest drop in price for the month on October 9, with California and West Coast (Less CA) dropping $0.03, and the United States losing $0.07. Average gasoline retail prices are lower in October than September, with the United States seeing the greatest price drop of $0.12. The monthly average retail prices in October were $3.08, $2.51, and $2.71 (**sidebar**) which is 10, 11, and 10 percent above year-ago prices, respectively.

Last *Petroleum Watch* examined how Hurricanes Harvey and Irma caused a steep increase in prices even in California. October's retail price data show how temporary these increases can be. Historically, retail prices in October have not increased since 2013. A weakening price can indicate either increasing supply or decreasing demand, all other things being equal. The lower retail prices coupled with declining gasoline production and inventories (**page 9**) makes a case that demand for gasoline is decreasing. This downward trend is expected to continue into the holiday season.

On November 1, the state excise tax increased by $0.12 per gallon, raising it from $0.297 to $0.417 per gallon. This was a one-time adjustment passed by the California State Legislature as Senate Bill 1 (SB 1, Beall, Chapter 5, Statutes of 2017). California's Board of Equalization regularly adjusts the excise tax of gasoline July 1 and will resume doing so in 2018.

Gasoline Prices

October 2017 vs 2016
(Percent Change)

California	10% higher
U.S.	11% higher
West Coast	10% higher

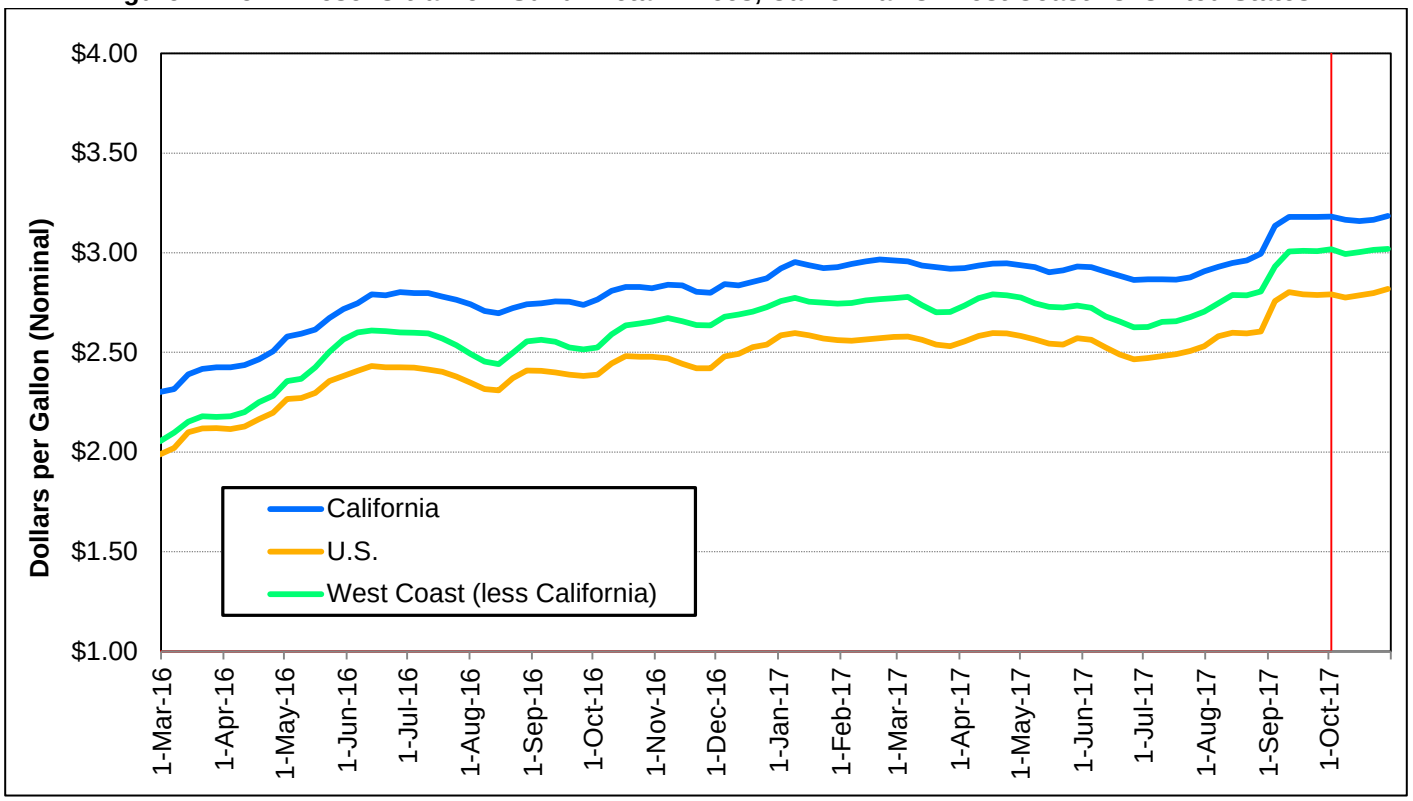
October 2017 Averages

California	$3.08
U.S.	$2.51
West Coast	$2.71

Week of October 30, 2017

California	$3.07
U.S.	$2.49
West Coast	$2.69

Figure 4: No. 2 Diesel Ultra-Low-Sulfur Retail Prices, California vs. West Coast vs. United States



Source: U.S. EIA

Diesel retail prices increased across the United States by $0.03 from $2.79 on October 2 to $2.82 on October 30 (**Figure 4**). Meanwhile, gasoline prices decreased $0.08 to $2.49 during the same period (**Figure 3**). This trend of increasing diesel price and decreasing gasoline price has created a big gap between the costs of U.S. diesel and gasoline price by $0.33 a gallon. The gap this year averaged $0.21 a gallon.

The California diesel price had little change during October but was 13 percent or $0.36 higher when compared to same month last year. Strong diesel prices have set high prices for 2017 for the last three months. These records were $3.00 in August, $3.18 in September, and $3.19 in October. Diesel will continue to see higher prices when California diesel retail sales tax rates increase from 9 percent to 13 percent, and excise tax rates increase $0.20 a gallon from $0.16 to $0.36, starting November 1.

West Coast (less California) diesel prices remained steady at $3.02, starting October 2 and ending October 30 at the same price. The monthly West Coast diesel price of $3.01 was the highest average since $3.01 in June 2015, also the last time the West Coast diesel price was more than $3.00 a gallon.

Diesel Prices

October 2017 vs 2016
(Percent Change)

California	**13% higher**
U.S.	**14% higher**
West Coast	**15% higher**

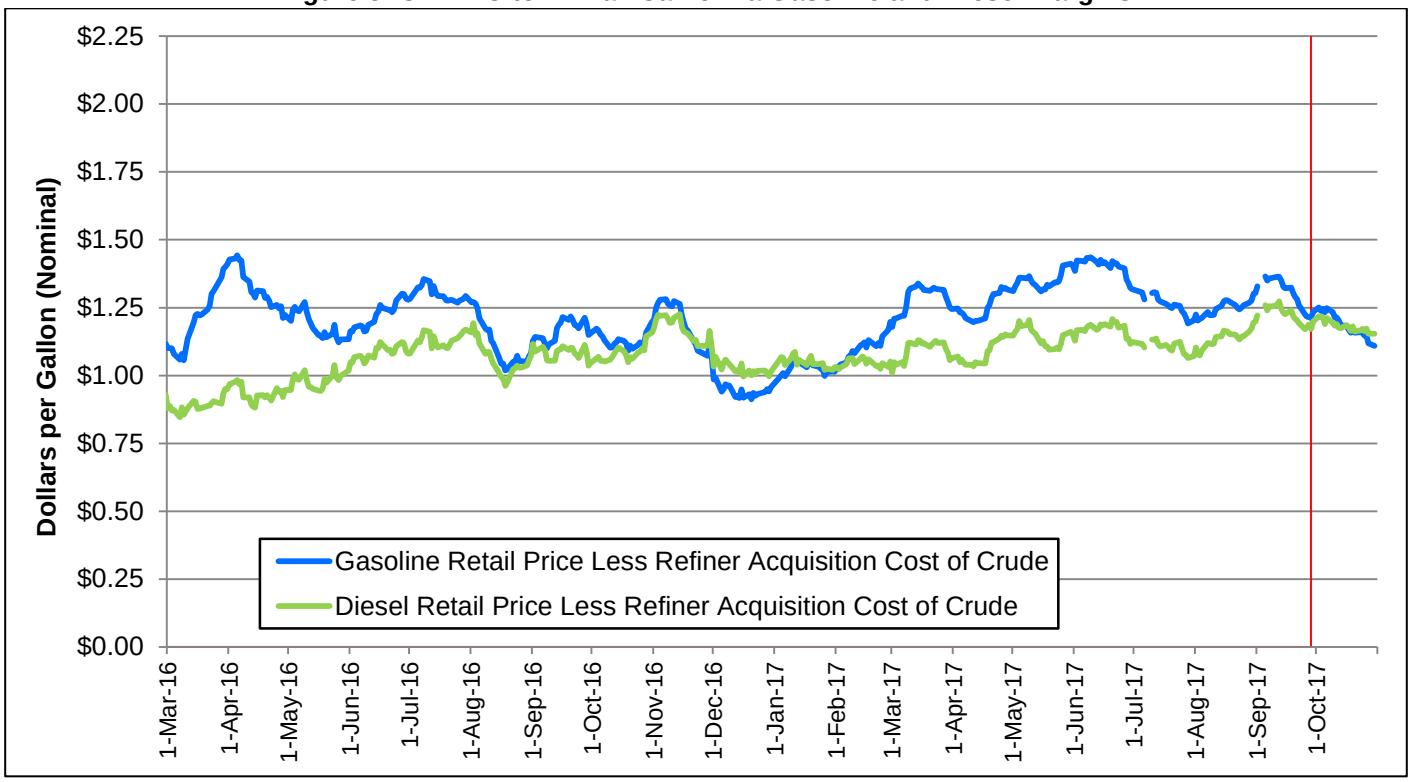
October 2017 Averages

California	**$3.17**
U.S.	**$2.78**
West Coast	**$2.99**

Week of October 30, 2017

California	**$3.19**
U.S.	**$2.82**
West Coast	**$3.02**

Figure 5: CA-RAC to Ex-Tax California Gasoline and Diesel Margins



Source: U.S. EIA and OPIS

CA-RAC-to-ex-tax retail gasoline and diesel margins fell throughout October (**Figure 5**). The gasoline margin began October at $1.25 before a steady decline to $1.11 on October 30. The diesel margin began October at $1.22 and remained steady until October 11 before slowly falling to $1.15 on October 30. Retail gasoline prices decreased $0.06 in October, while retail diesel prices increased $0.02. Crude oil prices (CA-RAC) increased $0.08 cents per gallon. The reduction in margins was inevitable with crude input prices outpacing California fuel retail prices.

Gasoline margins are 5 percent higher than October 2016 values, and diesel margins are 9 percent higher. The gap between the two margins appears to have a cyclic pattern, widening in the spring and narrowing midsummer. From January to July 2016, the average difference between the gasoline and diesel margin was $0.26. The difference narrowed to $0.16 in July. For 2017, the January-to-July average difference was $0.14. In both 2016 and 2017, that difference shrank to averages of $0.08 and $0.03, respectively.

In the previous *Petroleum Watch*, the shrinking in the difference of margins was attributed to changes in demand for the respective products. Another factor to consider is that diesel demand in California stays predictable through the entire year, as trucking companies and farm equipment suppliers tend to buy ahead of time, when possible. Gasoline demand shows more volatility in seasonal demand patterns because margins are at the whim of broad consumer demand, and this becomes a harder pattern for producers to predict and respond to.

Crude to Retail Margins

October 2017 vs 2016
(Percent Change)

Gasoline	**5% higher**
Diesel	**9% higher**

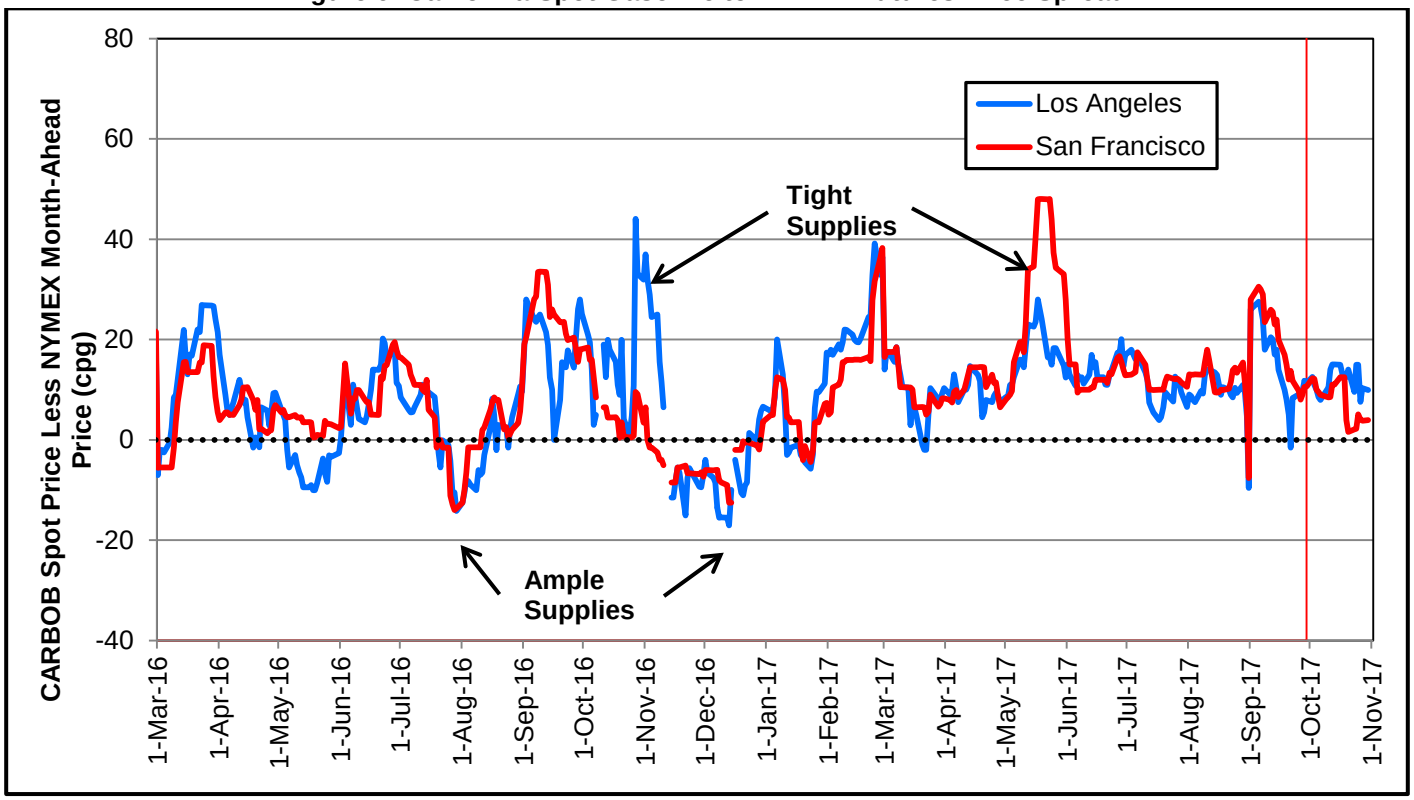
October 2017 Averages

Gasoline	**$1.19**
Diesel	**$1.18**

October 30, 2017

Gasoline	**$1.19**
Diesel	**$1.18**

Figure 6: California Spot Gasoline to NYMEX Futures Price Spread



Source: U.S. EIA and OPIS

The Los Angeles (LA) and San Francisco (SF) gasoline spot markets were relatively steady in October compared to September. The LA and SF-less-New York Mercantile Exchange (NYMEX) spot price differentials reduced to pre-hurricane values by September's end, with the seasonal change in gasoline formula being the main factor affecting the spreads later in the month.

The LA-less-NYMEX spot price differential decreased briefly from $0.13 on October 2 to $0.08 on October 6 (**Figure 6**). During this time, gasoline production and inventories were at the upper end of average levels within the five-year band (**Figure 8**). Southern California production decreased the following weeks due to unplanned and planned refinery shutdowns (**page 1**), leading to inventory declines. The approaching market deadline to trade summer-blend gasoline and the limited available gasoline stocks led to some refiner buying, which, in turn, helped the LA spot price differential rise and remain above the SF spot price. As a result, the LA spread widened to $0.14 by October 11 but remained static thereafter. On October 26 the LA spot price fell to $0.08, as it often happens after the switch to winter specification gasoline, but went up again due to production concerns from a refinery event on October 27.

The SF gasoline spot price differential followed a pattern similar to the LA component until it narrowed from $0.13 on October 18 to $0.04 on October 19, the day when the switch to winter-blend gasoline occurred. Unlike LA, the SF gasoline spot price differential remained low the rest of the month.

Gasoline Spot–Futures Spread

October 2017 vs 2016

Los Angeles	4¢ lower
San Francisco	1¢ higher

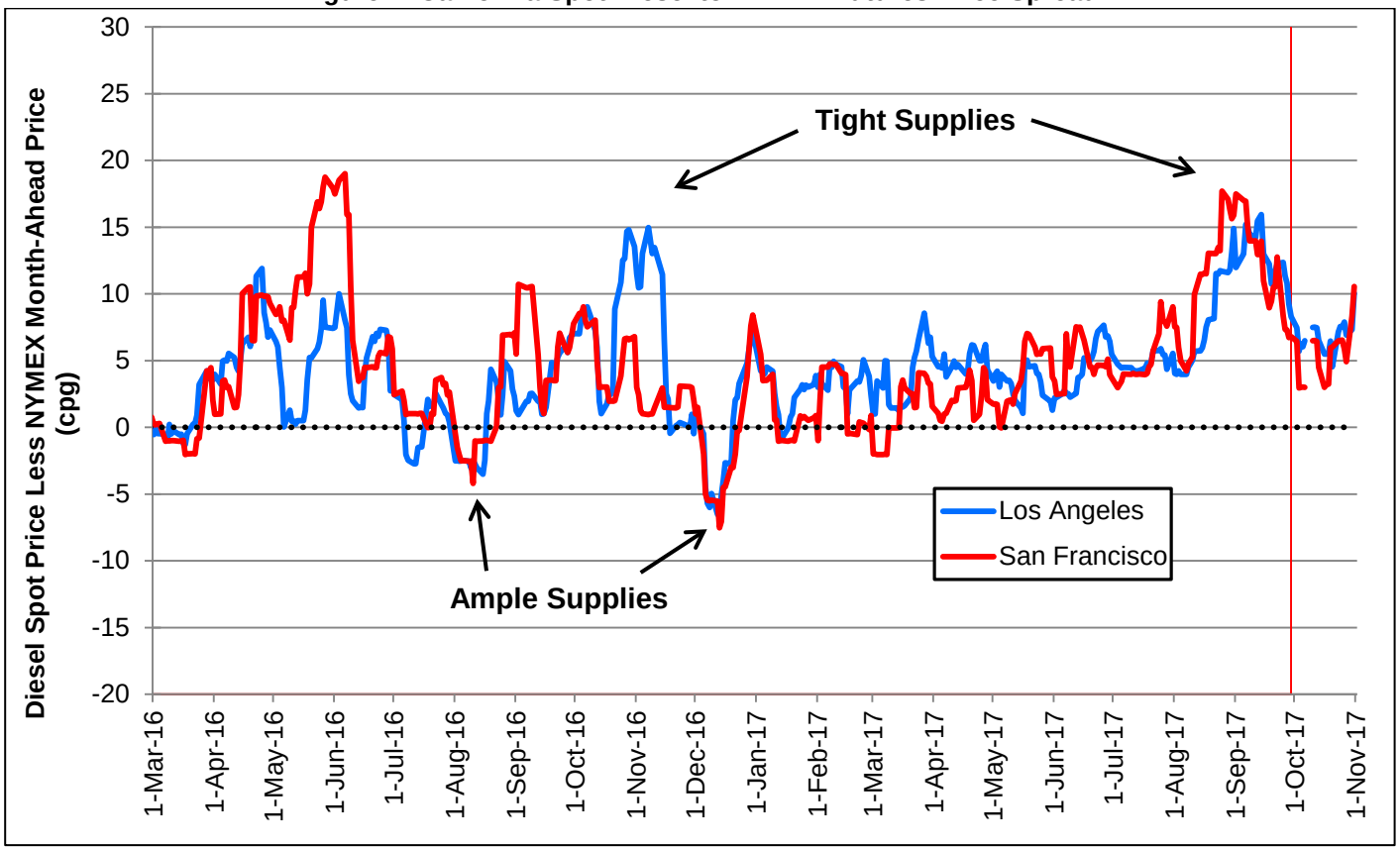
October 2017 Averages

Los Angeles	12¢
San Francisco	8¢

October 31, 2017

Los Angeles	13¢
San Francisco	5¢

Figure 7: California Spot Diesel to NYMEX Futures Price Spread



Source: U.S. EIA and OPIS

The SF-less-NYMEX diesel differential was relatively quiet throughout October. SF-less-NYMEX fluctuated between $0.03 and $0.07 until Halloween, when the differential increased to $0.11. For October, the average SF diesel differential fell 54 percent from $0.12 in September to $0.05 to match the monthly average of October 2016. Like October 2016, the diesel differential was low through the middle of October 2017 before sharply increasing on October 30-31 (**Figure 7**).

The September average of $0.13 was the highest LA-less-NYMEX diesel spread since September 2012 at $0.16 and has decreased 46 percent to $0.07 for the October average. The LA-less-NYMEX diesel differential spread stayed under $0.10 through the first 30 days but gained $0.03 on October 31 to $0.10.

SF and LA diesel differentials increased $0.08 and $0.03 during October 2017, respectively. At the same time, diesel inventories were down 0.8 million of barrels statewide in the last three weeks (**Figure 9**). The decrease in diesel supplies added strength to higher diesel differential prices during the end of October.

Diesel Spot–Futures Spread

October 2017 vs 2016

Los Angeles	1¢ lower
San Francisco	0¢ even

October 2017 Averages

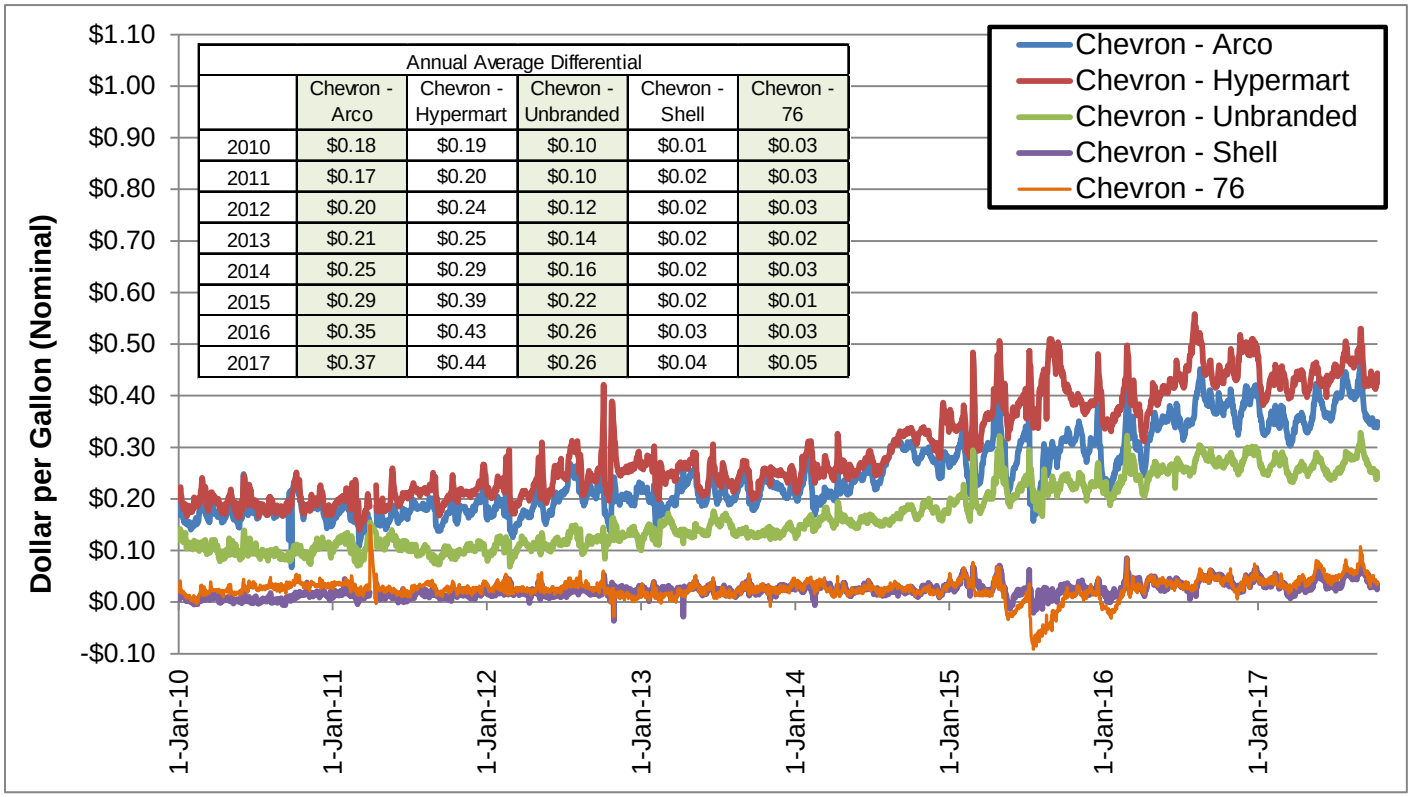
Los Angeles	7¢
San Francisco	5¢

October 31, 2017

Los Angeles	10¢
San Francisco	10¢

This growth in the gap between brands is more clearly seen in **Figure 11**, which shows the daily difference between various brands of gasoline compared to Chevron. In this figure, the purple and orange lines (difference between Chevron minus Shell and 76 respectively) remain straight throughout the entire period of the graphic, with annual averages of these differences ranging between $0.01 and $0.05. On the other hand, the difference between prices for the Chevron brand and ARCO brand doubled, from an annual average of $0.18 in 2010 to $0.037 in 2017. (See table included in **Figure 11.**) This story is roughly similar for both hypermart and unbranded retailers as well. In 2010, hypermart retailers sold gasoline at an average discount to Chevron of $0.19, and unbranded retailers sold gasoline at a $0.10 discount. By 2017, that difference has more than doubled to $0.44 for hypermarts and $0.26 for unbranded.

Figure 11: California Average Retail Brand Differentials (Jan. 2010 to Aug. 2017)



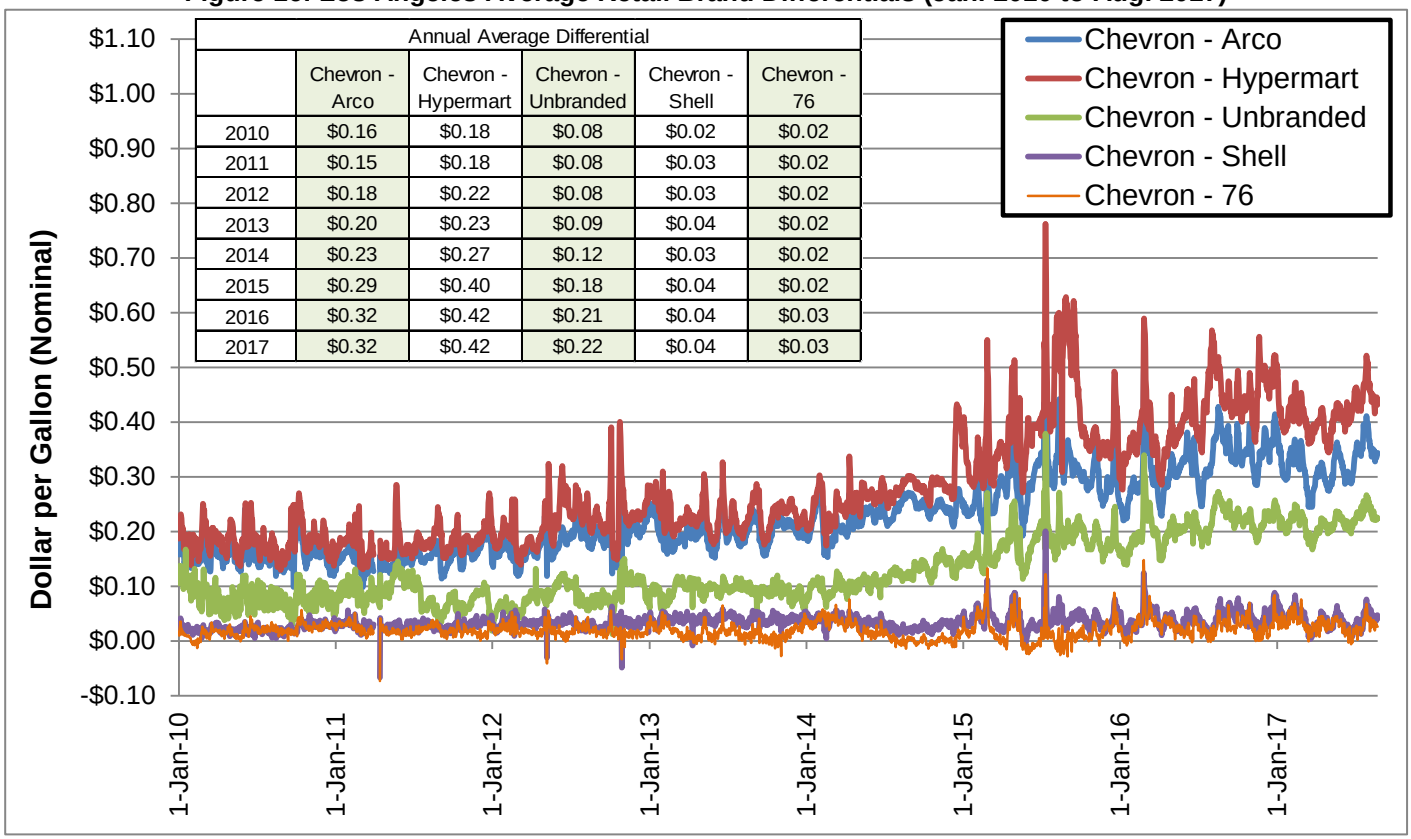
Source: Oil Price Information Service

There are a few factors to consider that preclude any conclusions without additional analysis:

1) Different brands have different contract structures (for example: rack purchase vs dealer-tank-wagon, and so forth).
2) Stations sometimes imbed credit and debit card charges into the price of gasoline differently (for example, ARCO charges a flat card fee, while other stations will post two prices).
3) Many gasoline brands now have their own credit cards that offer discounts on gasoline purchases, which may be hiding the true cost of the fuel.
4) Stations and brands may be differentiating themselves on customer experience (for example, shorter lines, cleaner facilities, and so forth).
5) Certain brands often have propriety additive packages that are added to the fuel to improve the qualities of that fuel. Chevron famously has Techron,[4] while Shell provides nitrogen-enriched gasoline.[5] That said, all gasoline sold in California is held to a stricter standard than fuels sold meeting the minimum federal requirements.

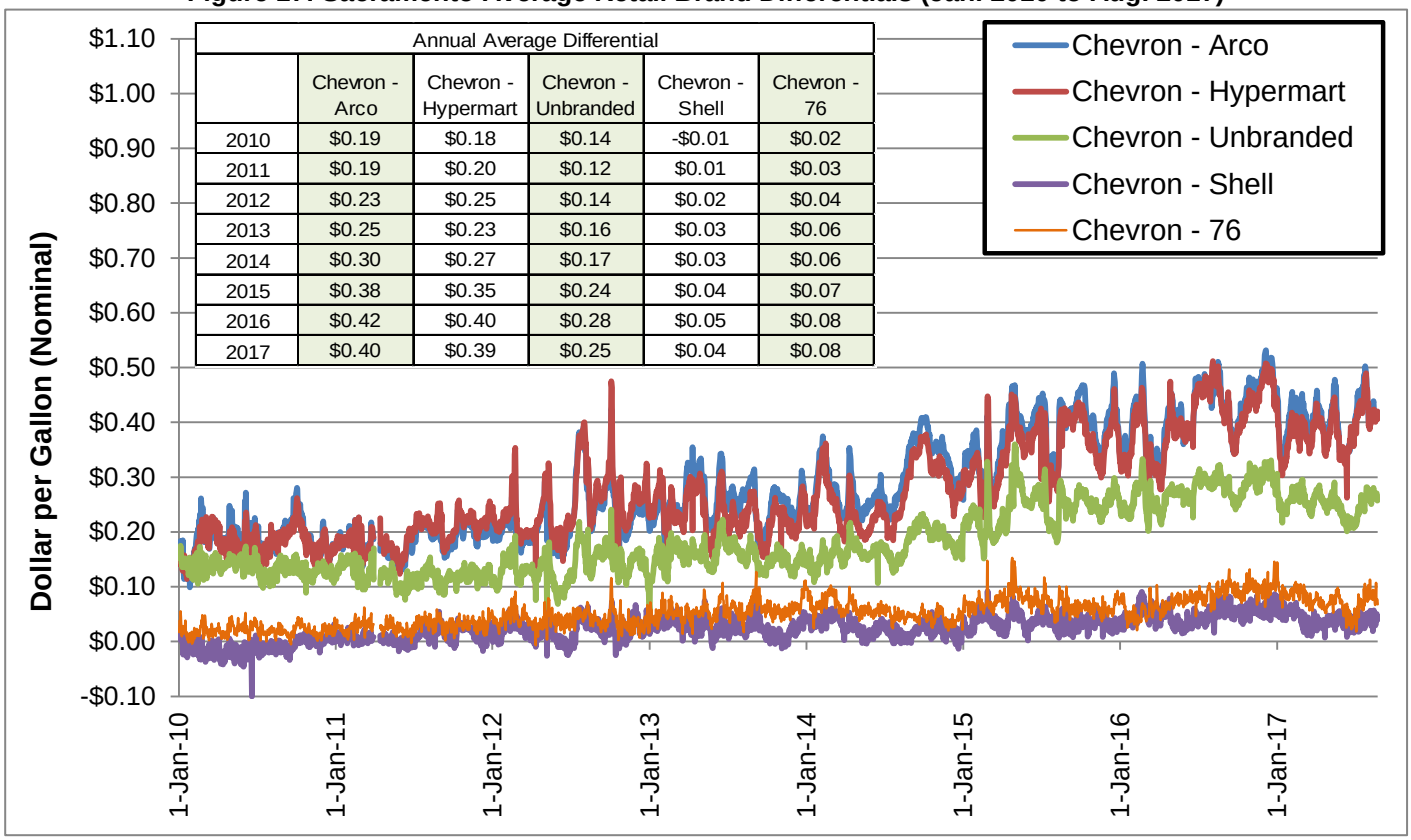
4 http://www.techron.com/.
5 http://www.shell.us/motorist/shell-fuels/shell-nitrogen-enriched-gasolines.html.

Figure 16: Los Angeles Average Retail Brand Differentials (Jan. 2010 to Aug. 2017)



Source: Oil Price Information Service

Figure 17: Sacramento Average Retail Brand Differentials (Jan. 2010 to Aug. 2017)

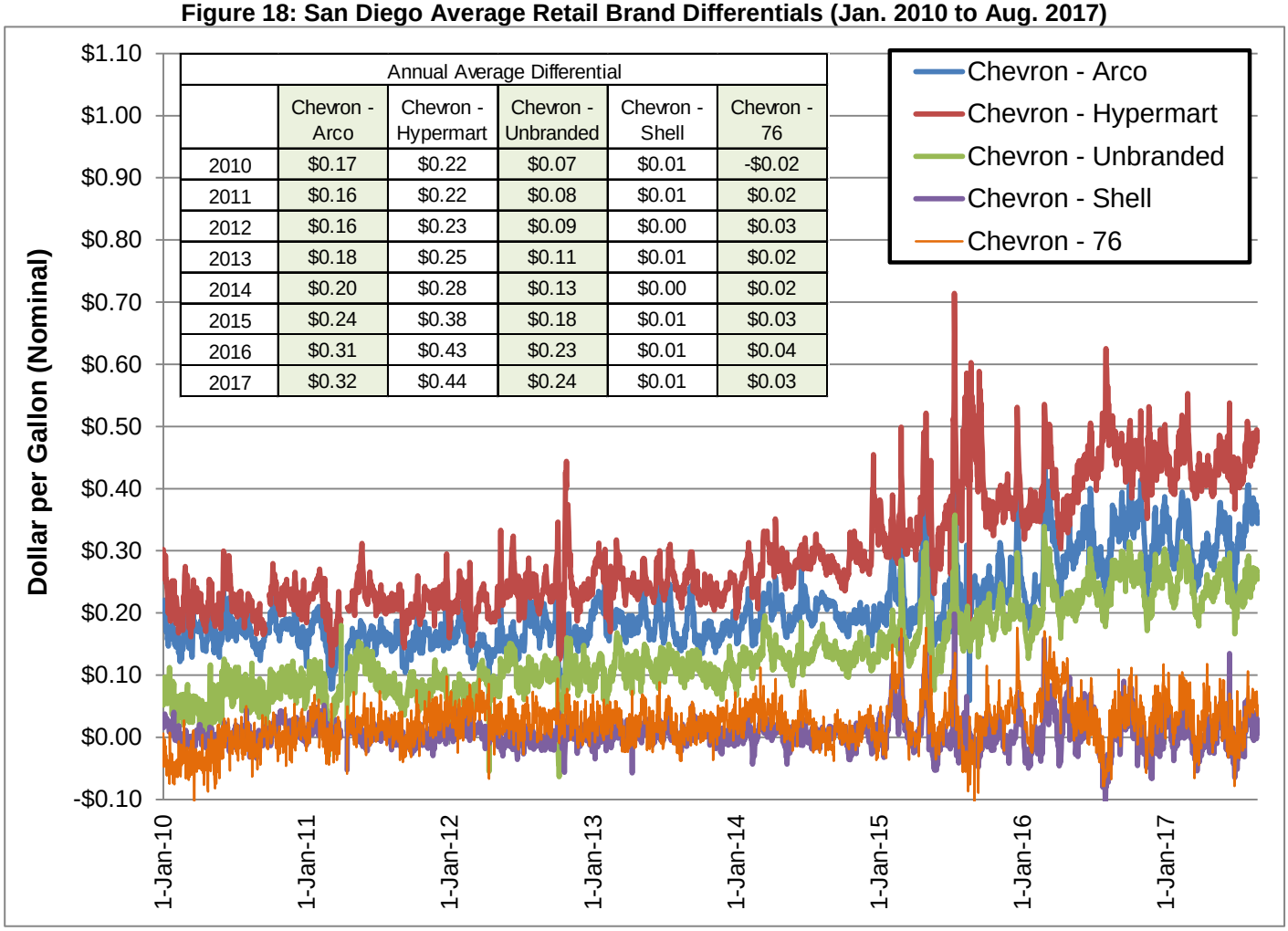


Source: Oil Price Information Service

Moving to the San Diego region (**Figure 18**), the overall trend of ARCO, hypermarts, and unbranded gasoline retailer pricing disconnecting from Chevron, Shell, and 76 is seen here as well. In the case of ARCO and hypermarts, the differential to Chevron gasoline prices started at an average of $0.17 and $0.22 in 2010, respectively, and rose to $0.32 and $0.44, respectively, by 2017. During this rise in the low-price brand differentials, differentials to Shell and 76 remained relatively constant, with no average rise between Chevron and Shell prices and a slight rise in the Chevron-to-76 differential to $0.03 by 2017. Similar to the Central Valley Area and later with the Southern Desert Area, the San Diego differentials appear more volatile with constant large shifts up and down in the average difference.

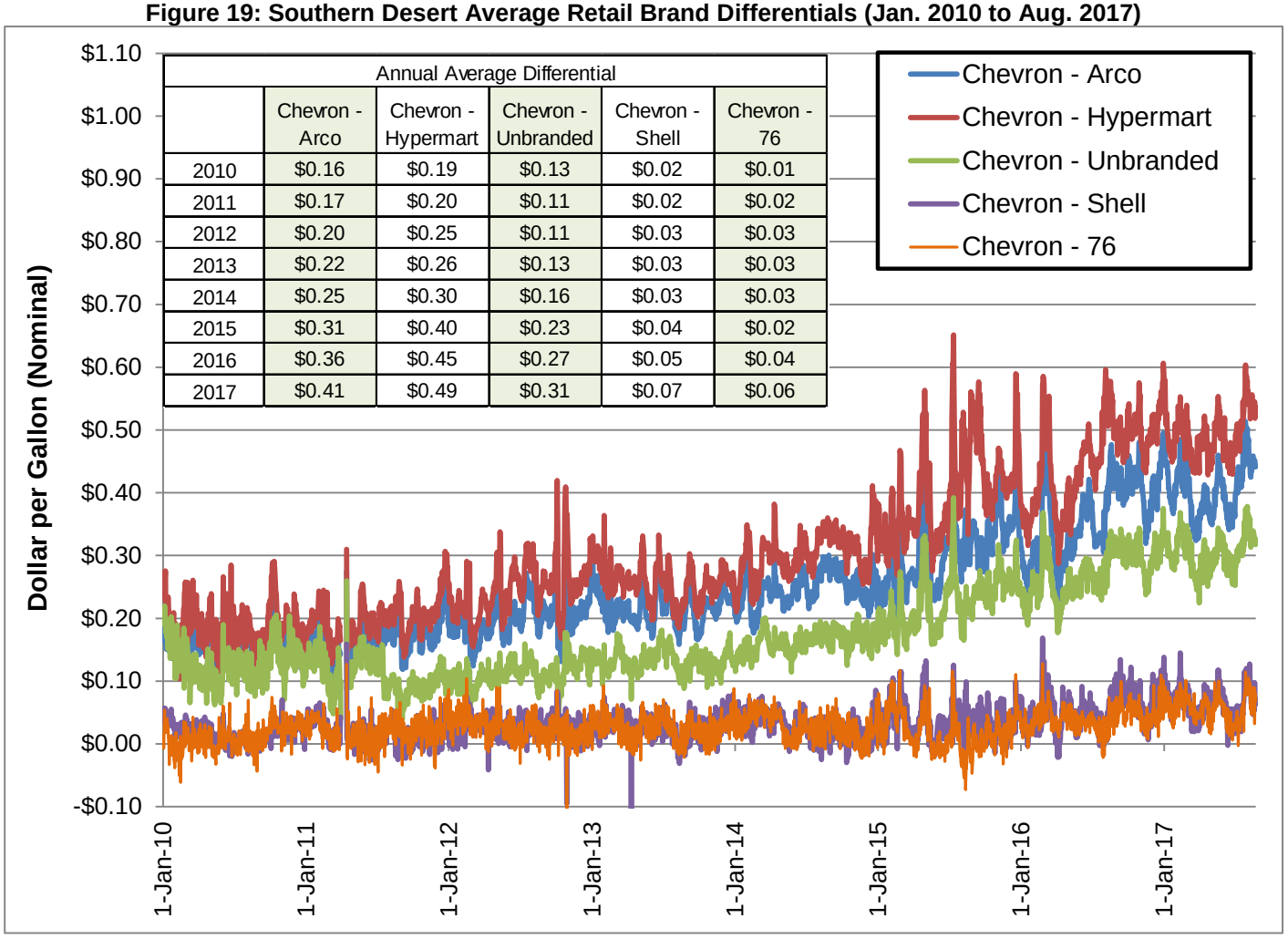
Finally, in the Southern Desert region, differentials here are moving in the same patterns seen in other areas (**Figure 19**). Like the Central Valley, Sacramento, and San Diego areas, the number of stations in the Southern Desert Area was roughly half that of both the Bay Area and Los Angeles Area. Like San Diego, but unlike the other areas, the Southern Desert had a higher concentration of ARCO stations in comparison to Chevron stations in the area (1.3 ARCO stations for every Chevron station in this area compared to an average of 0.5 for the other regions). In addition, likely because of the lessor number of reporting stations, the differentials in this area appear more volatile (similar to the Central Valley and San Diego regions). Differentials in this area reached levels similar to the Central Valley, with the Chevron-versus-ARCO and hypermarts price differentials growing to as large as $0.41 and $0.49, respectively, by 2017.

Figure 18: San Diego Average Retail Brand Differentials (Jan. 2010 to Aug. 2017)



Source: Oil Price Information Service

Figure 19: Southern Desert Average Retail Brand Differentials (Jan. 2010 to Aug. 2017)



Source: Oil Price Information Service

In conclusion, the statewide disconnect between "low-priced" and "high-priced" brands appear to be a phenomenon that is happening in all areas of the state. The general pattern of the separation between brands is similar, but in absolute price terms, these increases appear to be largest in more rural areas. Based on this general increase in the differentials and lack of change in overall gasoline market share, casual inspection of the results indicates that there is a segment of consumers in California that views different brands of gasolines as different products and thus are willing to pay a higher price for them. Whether this is due to some sort of consumer experience preference (for example, reduced wait times) or from a perceived difference in product is unclear. What is clear is that the low-cost leaders for retail gasoline in California are ARCO and hypermart retailers. High-priced retail brands of gasoline have been able to differentiate their product from these low-cost leaders in such a way that allows them to maintain these higher prices without substantially changing their California market share.