



PETROLEUM WATCH

California Energy Commission

April 2016

Recent Petroleum News and Outside Analyses

Prices

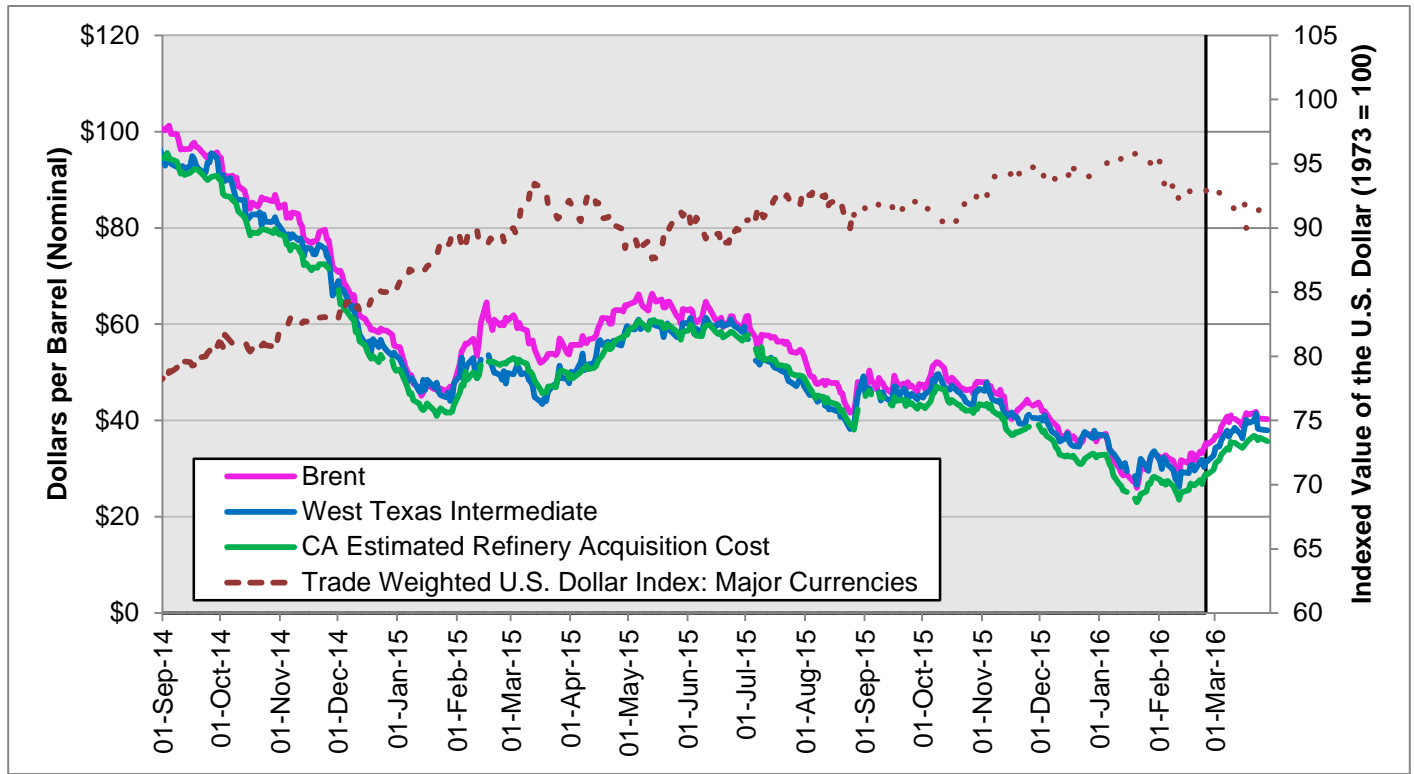
- **Crude Oil Prices:** Prices have continued to increase during March. Brent and West Texas Intermediate (WTI) crude prices closed at \$40.27 and \$37.99, respectively, up 12 percent and 16 percent since the end of February. Nevertheless, prices remain 20 to 30 percent below year-ago levels.
- **California Gasoline Prices:** California gasoline prices rebounded by \$0.40 during March and reached \$2.78 at month's end.
- **California Diesel Prices:** California diesel prices ended a nine-month decline by increasing \$0.13 during March to end the month at \$2.43.

Refining News

- **Tesoro Wilmington Refinery:** On March 15, the refinery experienced an unplanned incident that resulted in flaring. Production at the refinery is not expected to be affected. The refinery is undergoing planned maintenance.
- **Shell Martinez Refinery:** On March 28, the Martinez refinery reported the restart of a unit that was shut down on March 16. The refinery is planning maintenance for early May.
- **Valero Benicia Refinery:** On March 29, the company's 149,000 barrels per day (bpd) refinery restarted its fluid catalytic cracker unit, indicating the wrap-up of a large-scale turnaround involving several units that began in early February.
- **ExxonMobil Torrance Refinery:** On March 24, ExxonMobil closed its alkylation unit for maintenance after an issue was discovered. There is no indication on how long the unit will be offline. On April 3 the South Coast Air Quality Management District approved the company's 155,800 bpd refinery restart plan. No expected date was announced when the restart will occur. The acquisition of the refinery by PBF is expected to take place June 1.

Crude Oil Prices

Figure 1: Daily West Coast Spot Crude Oil Prices, June 2014 to Present



Source: U.S. Energy Information Administration (U.S. EIA), Oil Price Information Service (OPIS), and Federal Reserve Bank of St. Louis. Note: Shaded areas on all graphs indicate previous report data. Unshaded areas indicate new data since January's *Petroleum Watch*.

Crude oil prices have increased substantially since late February (Figure 1). West Texas Intermediate (WTI) moved from \$31.37 on February 22 to \$37.99 on March 28. At the same time, the California Estimated Refiner Acquisition Cost¹ (CA-RAC) of crude oil rose from \$27.70 on February 22 to \$35.71 on March 28.

In spite of the large price increases seen in March—23 percent, 24 percent, and 29 percent for Brent, WTI, and CA-RAC, respectively—prices remain well below year-ago levels, as seen in the table at right. There are mounting expectations that several oil-producing countries will agree to freeze production, which may be driving rising prices. Notably, these countries do not include Iran, Canada, or the United States.

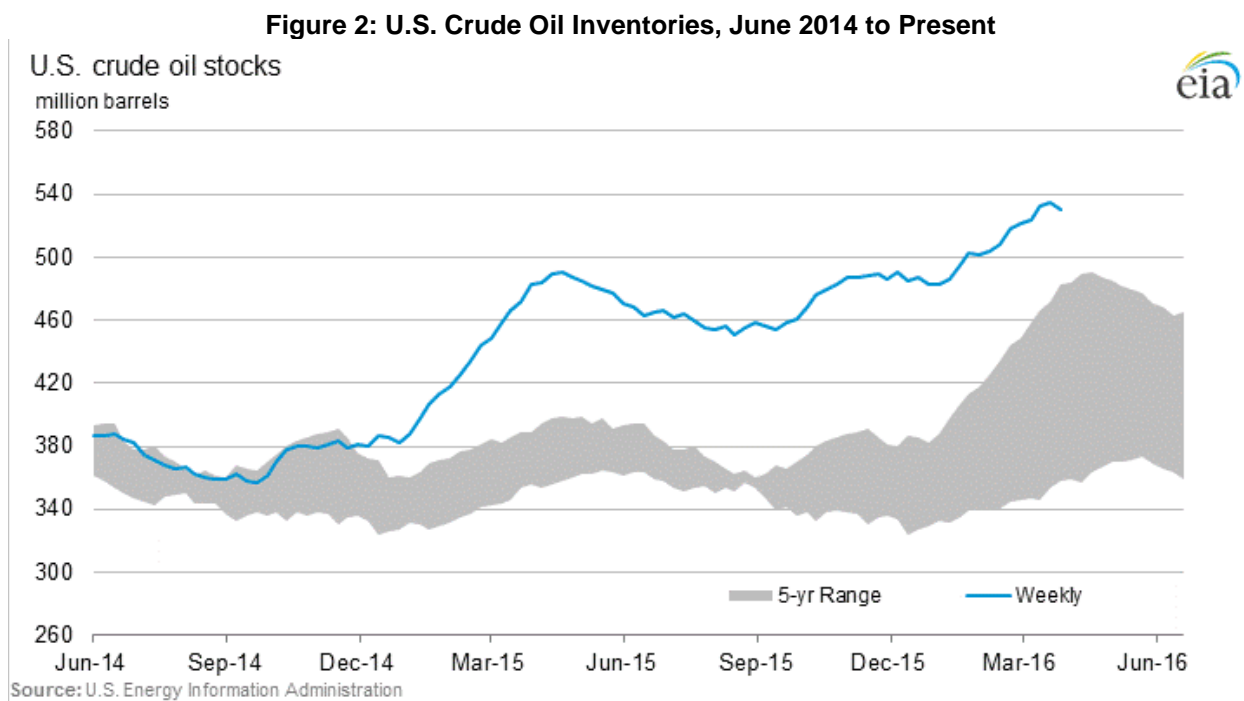
<u>Crude Oil Prices</u>	
<u>March 2016 vs 2015</u>	
(Percent Change)	
Brent	29% lower
WTI	21% lower
CA-RAC	30% lower
<u>March 2016 Averages</u>	
Brent	\$39.85
WTI	\$37.65
CA-RAC	\$34.61
<u>March 28, 2016</u>	
Brent	\$40.27
WTI	\$37.99
CA-RAC	\$35.71

¹California estimated refiner acquisition cost is an estimate of the average price of crude oil paid by California refineries. Energy Commission staff estimates proportions of California crude, Alaskan crude, and foreign crude and multiplying them by the prices of San Joaquin Valley, Alaskan North Slope, and Brent crude oil, respectively.

Crude Oil Production and Storage

Even though crude oil prices have climbed back to about \$40 per barrel, U.S. crude oil inventories continue to increase (**Figure 2**). Although U.S. Energy Information Administration (EIA) data show moderate declines in domestic crude oil production, it remains at a high level, keeping prices low and inventories high. Output from the Organization of the Petroleum Exporting Countries (OPEC) producers has leveled off but also remains at a high level. This combination of increasing domestic inventories and flat global production is likely to prevent crude prices from rising much.

- U.S. crude oil production for March is estimated by EIA at 9.0 million barrels per day (bpd). This is a 4 percent decline from both year-ago production levels and from the 2015 annual average production.
- Crude oil inventories in the United States increased during March to 530 million barrels at month-end although they were as high as 534.8 million barrels earlier in the month. Inventory levels remain high due to an increase in imports, which are 8 percent higher than a year ago.

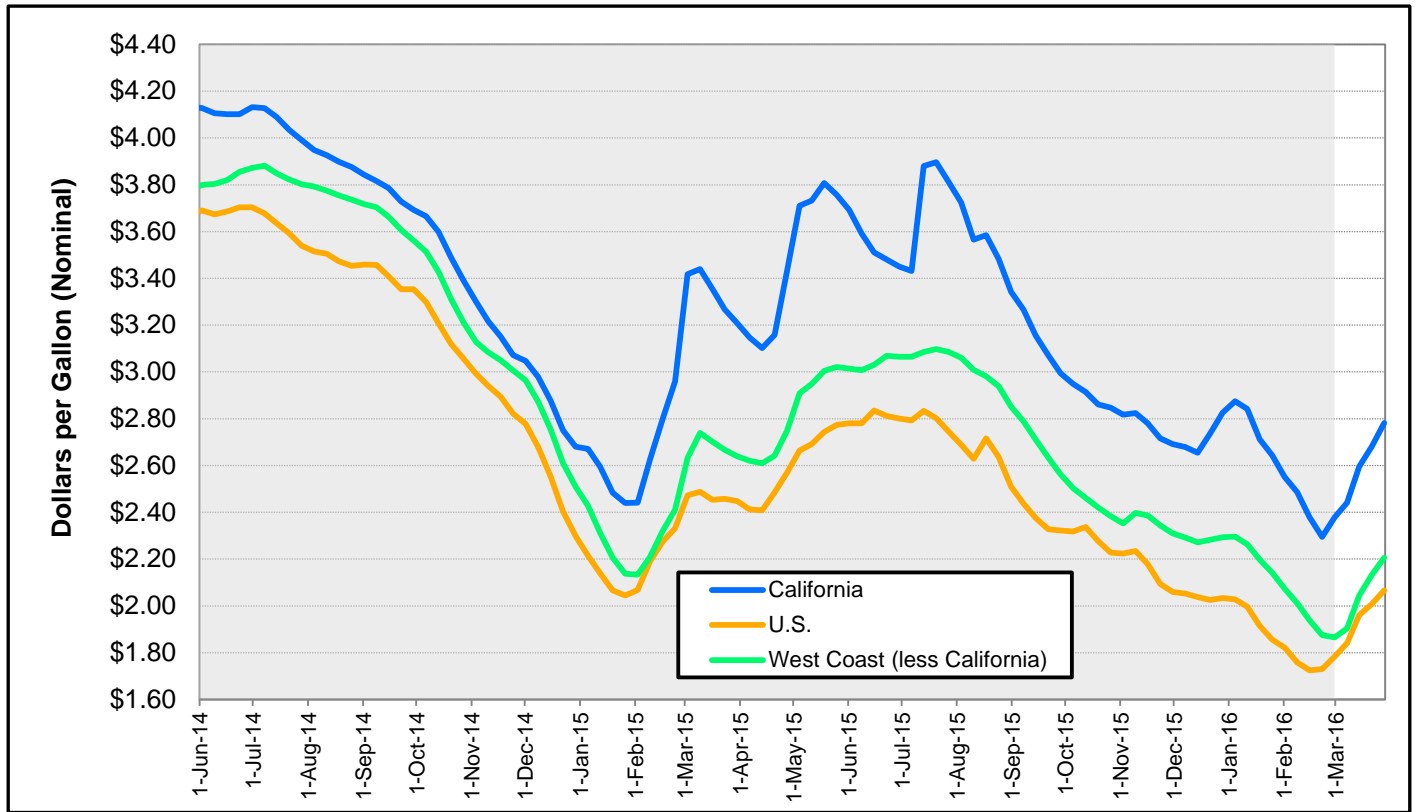


Source: U.S. EIA.

- According to the most recent data from OPEC for March, Saudi Arabian crude output continues to remain at 10.1 million bpd. With sanctions partially lifted, Iranian production was 3.3 million bpd, an increase of 16 percent from the 2015 average. Total OPEC production, however, declined 200,000 bpd from January's level to 32.25 million bpd.

Gasoline and Diesel Retail Prices

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



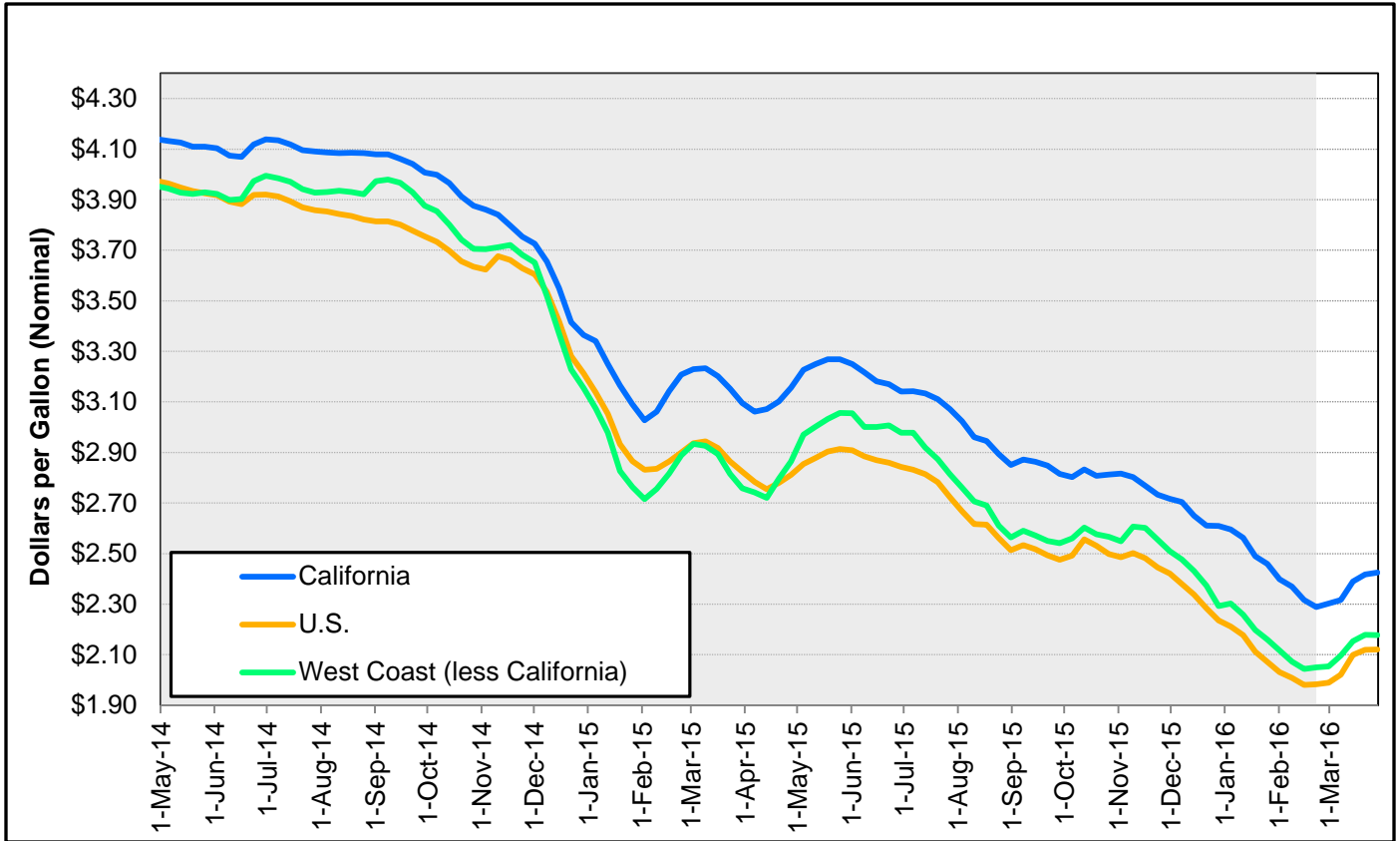
Source: U.S. EIA

After reaching a new five-year low of \$2.30 during the week of February 22, California gasoline prices climbed to \$2.38 by the beginning of March (Figure 3). The increase in crude oil prices (Figure 1), the drop in California gasoline inventory (Figure 8), and the shift from winter- to summer-blend gasoline are factors contributing to the price increase. California gasoline prices finished the month at \$2.78. Even with this increase, the average for the price of California gasoline for March was \$2.58, \$0.76 lower than a year ago.

Similarly, West Coast and U.S. gasoline prices climbed as well: starting from \$1.87 and \$1.78, respectively, during the week of February 29 and finishing at \$2.21 and \$2.07 during the week of March 28. During the same time frame, the difference between California and both the West Coast and the U.S. increased \$0.07 and \$0.12 respectively, reaching a difference of \$0.57 and \$0.71.

<u>Gasoline Prices</u>	
<u>March 2016 vs 2015</u>	
<u>(Percent Change)</u>	
California	23% lower
U.S.	22% lower
West Coast	24% lower
<u>March 2016 Averages</u>	
California	\$2.58
U.S.	\$1.93
West Coast	\$2.03
<u>Week of March 28, 2016</u>	
California	\$2.78
U.S.	\$2.07
West Coast	\$2.21

Figure 4: No. 2 Diesel Ultra-Low-Sulfur Retail Prices, California vs. PADD5 vs. United States



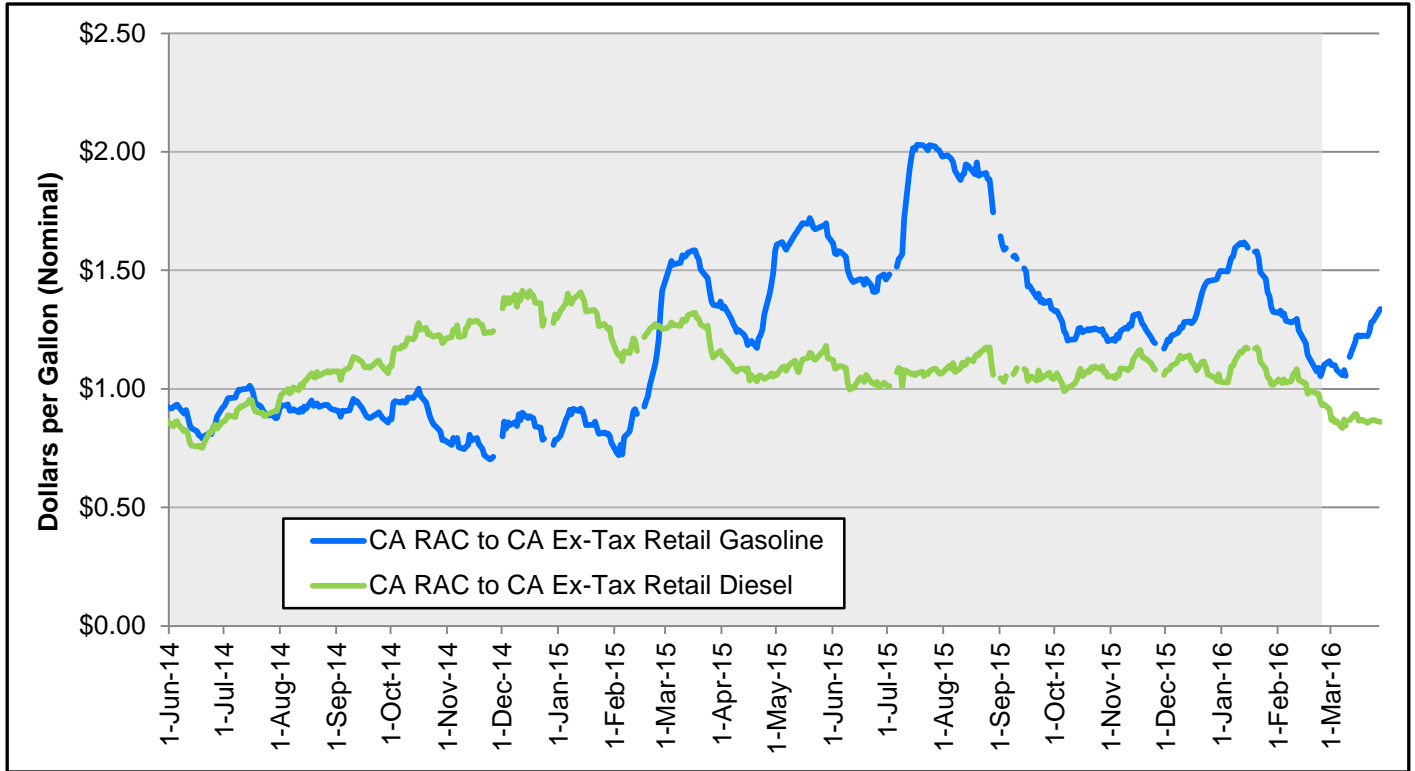
Source: U.S. EIA.

California diesel prices for March are up for the first time this year. At \$2.43 for the week of March 28, this is \$0.12 higher than February 25 (Figure 4). Similarly, the U.S. and West Coast March diesel prices both increased over month-end February levels, reaching \$2.12 and \$2.18, respectively, during the week of March 28. California averages for March are 24 percent higher than West Coast averages and 30 percent higher than U.S. averages.

The year-to-date (YTD) average difference between the California and U.S. retail diesel prices is \$0.34, and the YTD average difference between California and the West Coast is \$0.27. In March 2015 the average California, U.S., and West Coast diesel prices were \$0.81, \$0.83 and \$0.73 higher than in March 2016, respectively.

Diesel Prices	
March 2016 vs 2015	
(Percent Change)	
California	26% lower
U.S.	29% lower
West Coast	26% lower
March 2016 Averages	
California	\$2.37
U.S.	\$2.07
West Coast	\$2.13
Week of March 28, 2016	
California	\$2.43
U.S.	\$2.12
West Coast	\$2.18

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



Source: U.S. EIA and OPIS

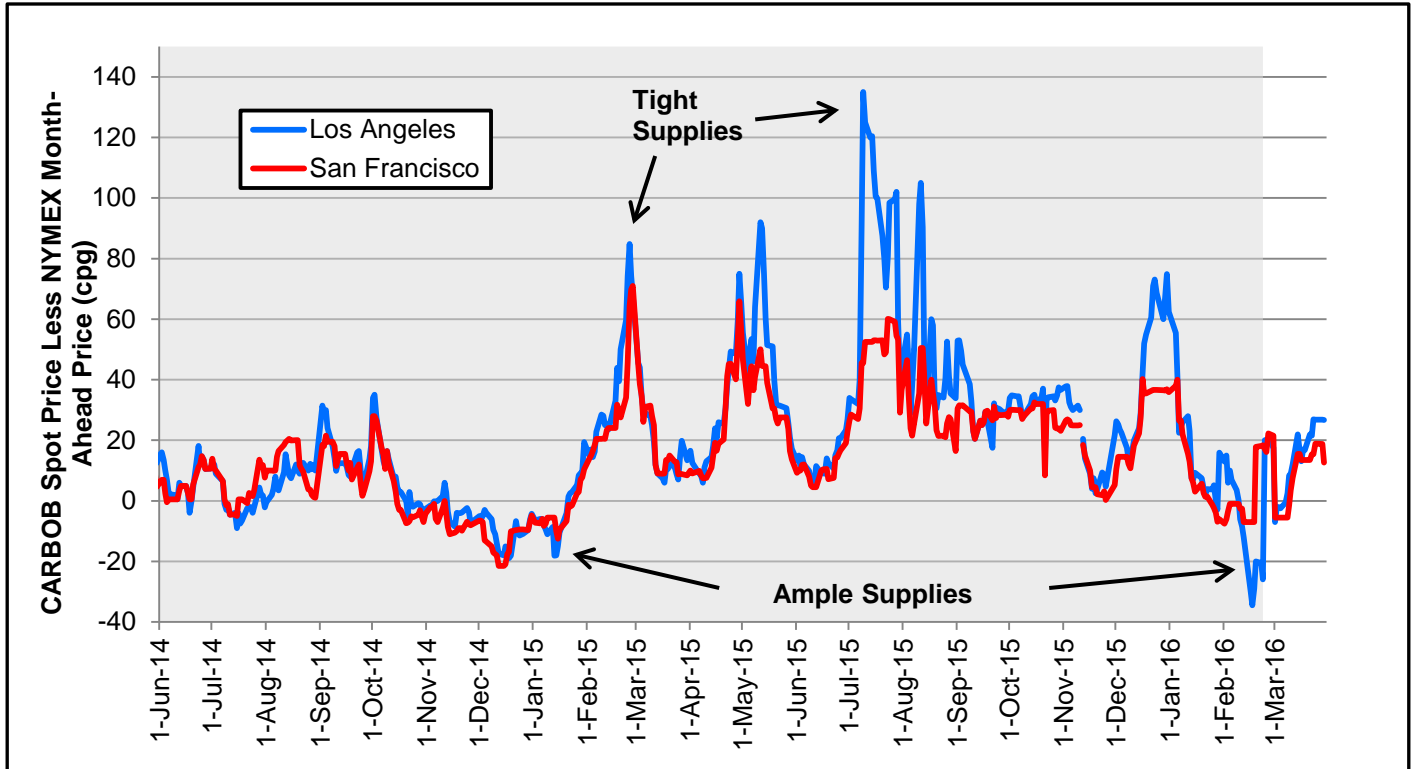
For the February 22 to March 28 period, the California Refinery Acquisition Cost (CA-RAC)-to-ex-tax retail gasoline margin increased \$0.23 to \$1.33, while the diesel margin decreased \$0.05 to \$0.86 (Figure 5).

The gasoline margin remains high 14 months after the explosion at ExxonMobil’s Torrance refinery on February 18, 2015. The gasoline margin, at \$1.33 on March 28, 2016, is only \$0.02 less than the \$1.35 of March 27, 2015. However, the gasoline margin during the same period in 2014 rested at \$0.82 on March 21, 2014. These margins suggest that the CA-RAC-to-retail margin is 45 cents higher than normal.

Historically, Californians begin to drive more in April as warmer weather and longer days encourage more travel ahead of the summer driving season. California gasoline inventories are low, constricting supply while raising retail prices.

<u>Crude to Retail Margins</u>	
March 2016 vs 2015	
(Percent Change)	
Gasoline	22% lower
Diesel	31% lower
March 2016 Averages	
Gasoline	\$1.18
Diesel	\$0.87
March 28, 2016	
Gasoline	\$1.33
Diesel	\$0.86

Figure 6: California Spot Gasoline to NYMEX Futures Price Spread



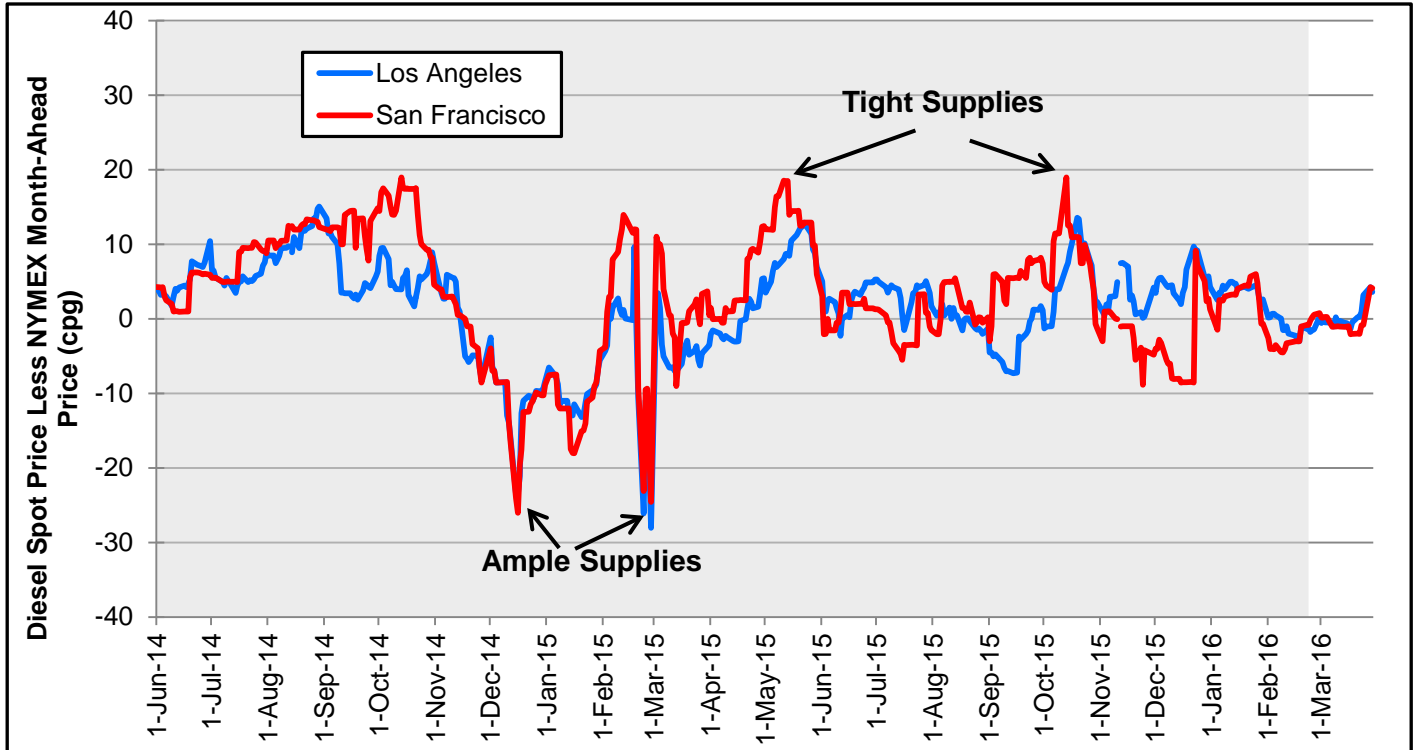
Source: U.S. EIA and OPIS

The spread between the Los Angeles (LA) spot gasoline price and the New York Mercantile (NYMEX) futures price increased in March (Figure 6). The LA-less-NYMEX spread experienced volatile swings through March. LA-less-NYMEX started at a historical low of -\$0.26 on February 23 rose to \$0.20 on February 26, dropped to -\$0.07 on March 1, and rose again to \$0.27 on March 23. The monthly average for the LA-less-NYMEX spread increased \$0.16 from -\$0.03 in February to \$0.13 in March. The quick reversal from negative to positive spread can be explained by the seasonal shift of gasoline from winter-grade to summer-grade. Summer-grade gasoline is more difficult to produce and has reduced the total available supply; this has pushed the spot price above the NYMEX price.

For the first week in March, the San Francisco (SF) spot price averaged \$0.05 below the NYMEX price. However, by March 14, the spread increased by \$0.20. The monthly average for the SF-less-NYMEX spread increased from \$0.04 in February to \$0.07 for March.

<u>Gasoline Spot-Futures Spread</u>	
<u>March 2016 vs 2015</u>	
(cents)	
Los Angeles	5¢ lower
San Francisco	31¢ lower
<u>March 2016 Averages</u>	
Los Angeles	12¢
San Francisco	7¢
<u>March 29, 2016</u>	
Los Angeles	26¢
San Francisco	12¢

Figure 7: California Spot Diesel to NYMEX Futures Price Spread



Source: U.S. EIA and OPIS

The LA spot prices for California Air Resources Board (CARB) diesel were barely below the NYMEX prices for most of March. The LA-less-NYMEX spread for CARB diesel reached a monthly low of -\$0.01 on March 17 before gradually reversing and reaching a high of \$0.04 on March 28 and 29. The monthly average for the LA-less-NYMEX differential is \$0.00, which is \$0.01 higher than a month ago and \$0.04 higher than a year ago (Figure 7).

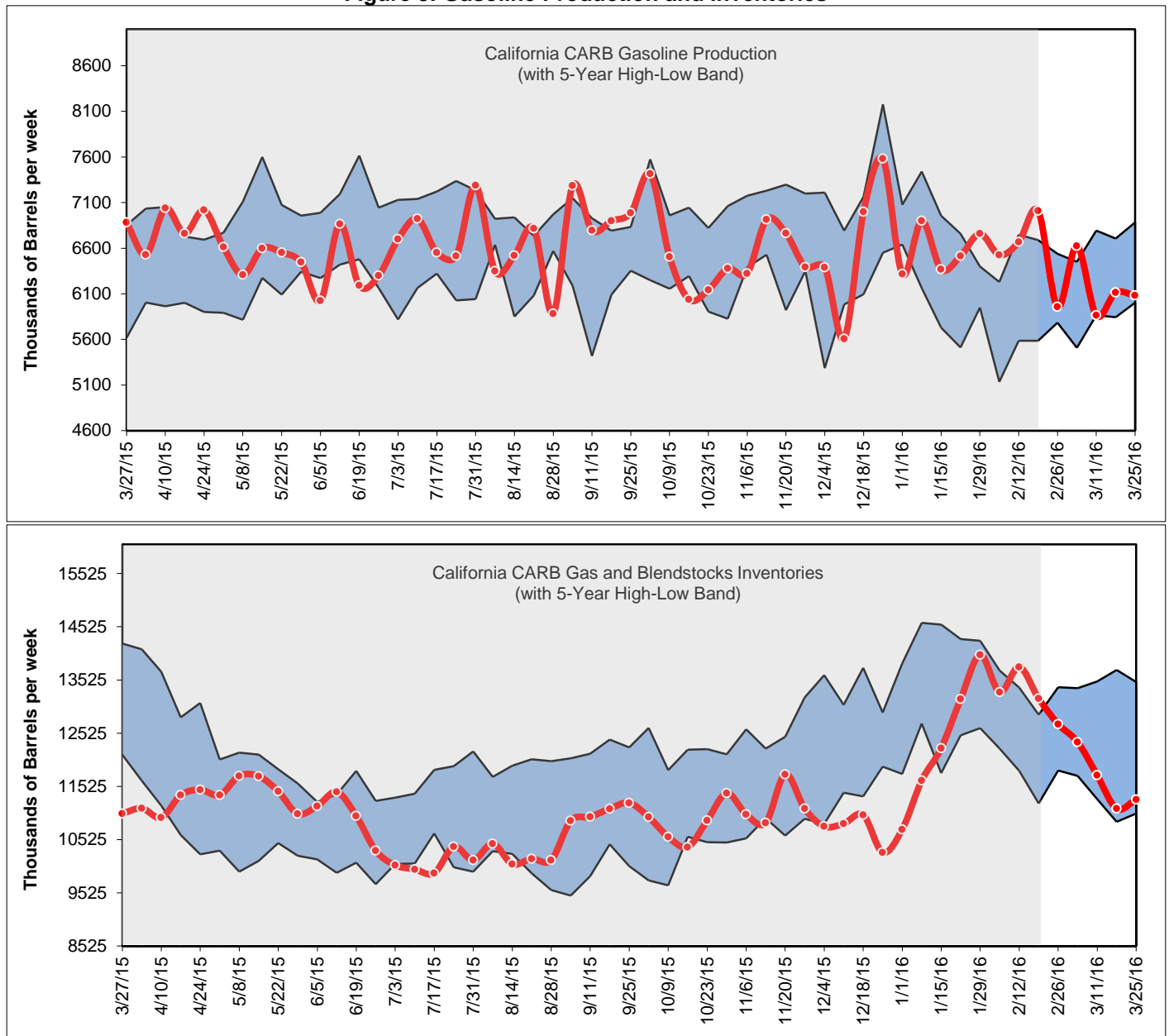
The SF spot prices were also consistently at or below NYMEX prices throughout most of March. The SF-less-NYMEX spread changed from \$0.00 during the first week of March to -\$0.01 during the second week and to -\$0.02 during the third week of March before reversing and reaching a high of \$0.04 on March 28 and 29. The monthly average for the SF-less-NYMEX differential is \$0.00, which is \$0.02 higher than a month ago but \$0.02 lower than a year ago.

The similar behavior of both spot market differentials—a small negative value for most of the month that reverses at month’s end—is also seen in Figure 11, which shows that although diesel production has fallen since February, it is still within the five-year bands. However, inventories, which remained well above the five-year high-low band since the beginning of the year, fell within the band for the first time the last week of March.

<u>Diesel Spot–Futures Spread</u>	
<u>March 2016 vs 2015</u>	
(cents)	
Los Angeles	4¢ higher
San Francisco	2¢ lower
<u>March 2016 Averages</u>	
Los Angeles	0¢
San Francisco	0¢
<u>March 29, 2016</u>	
Los Angeles	4¢
San Francisco	4¢

California Gasoline and Diesel Production and Inventories

Figure 8: Gasoline Production and Inventories

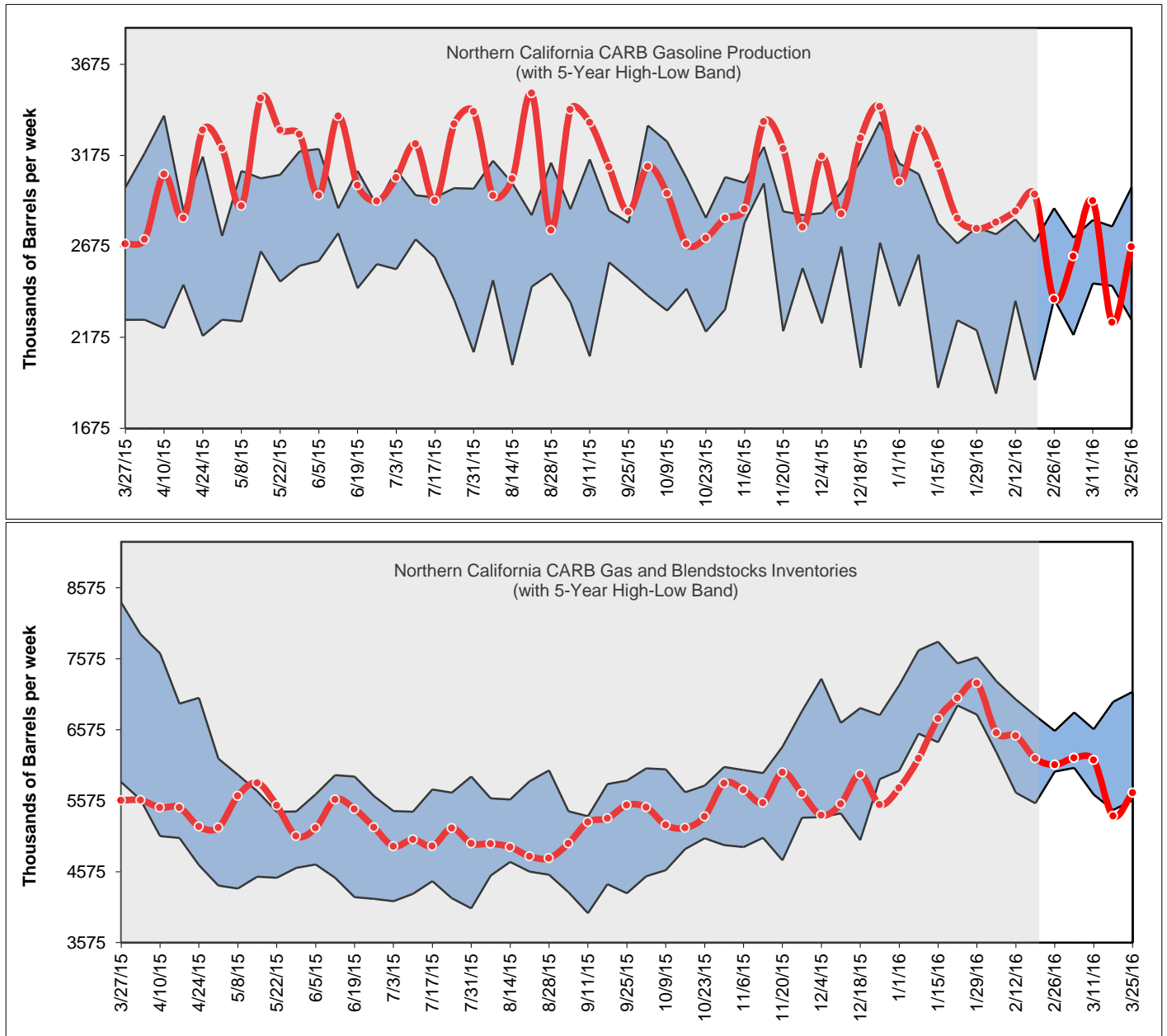


Source: PIIRA data

Gasoline production has been up and down each week since February 19, ending 13.3 percent lower after six weeks. California gasoline production dropped to the bottom of the five-year band at 6.08 million barrels-per-week (bpw) for the week ending March 25.

California gasoline inventories have declined since February 19, from 13.17 million barrels to 11.28 million barrels on March 25, 2016 (**Figure 8**).

Figure 9: Northern California Gasoline Production and Inventories

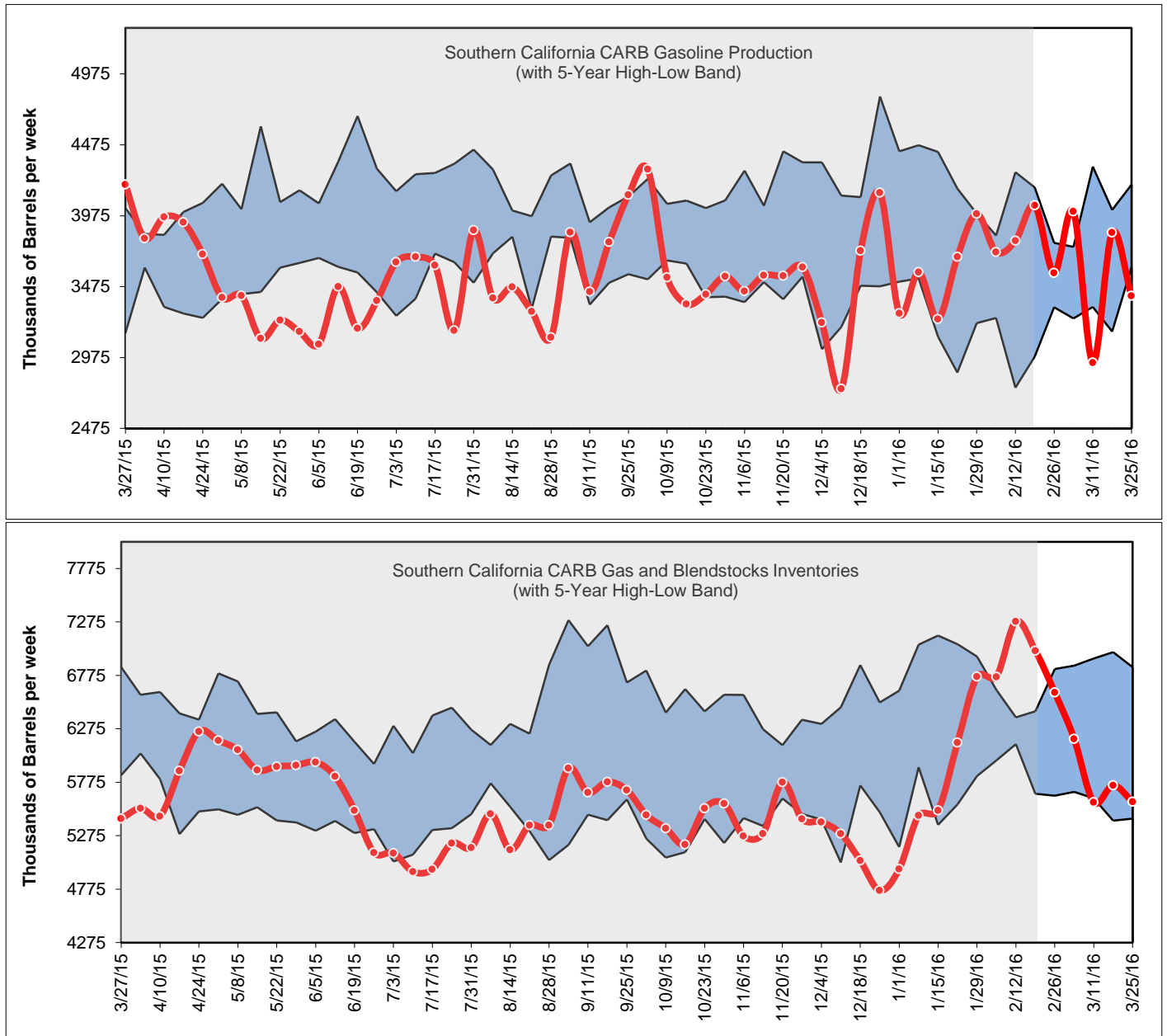


Source: PIIRA data

Northern California gasoline production has been on a roller-coaster ride for the past five weeks. Gasoline production went from above the five-year band at 2.92 million bpw on March 11 to below the five-year band at 2.26 million bpw on March 18. However, Northern California gasoline production settled at the middle of the five-year band for the week ending March 25, at 2.67 million barrels (**Figure 9**).

Northern California inventory levels have been within the five-year band for more than 80 percent of the past year. Closing the month, weekly inventories ended on the bottom of the band at 5.69 million barrels. This is slightly higher than year-ago levels of 5.58 million barrels.

Figure 10: Southern California Gasoline Production and Inventories

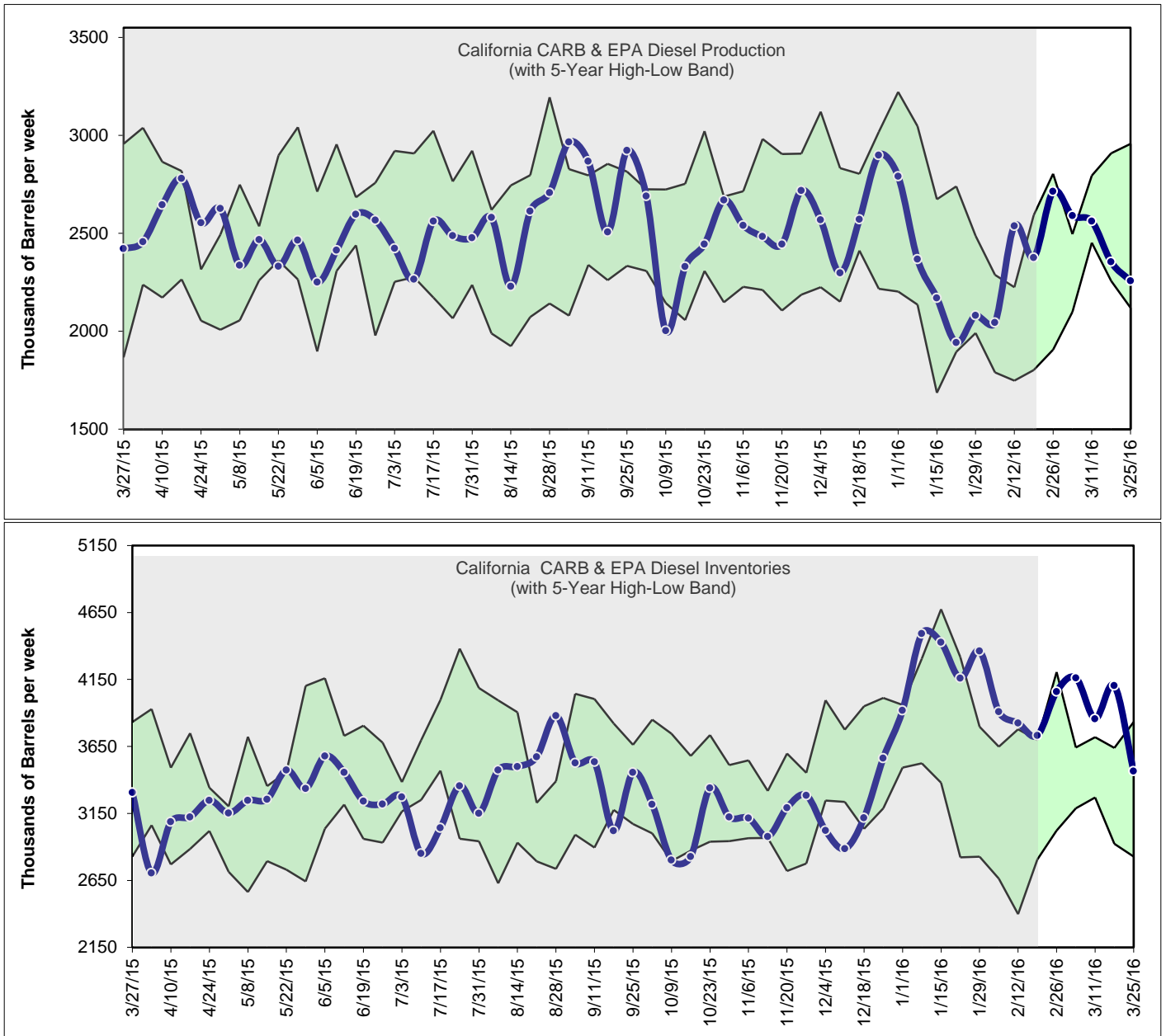


Source: PIIRA data

Between the weeks of March 4 and March 11, gasoline production fell 1.06 million barrels and setting a 2016 low of 2.94 million bpw. Southern California gasoline production ended the week of March 25 under the five-year band at 3.41 million barrels.

Inventories have declined each week from February 12 to March 11 and have settled at the bottom of the five-year band for the week ending March 25, at 5.59 million barrels (**Figure 10**).

Figure 11: Diesel Production and Inventories



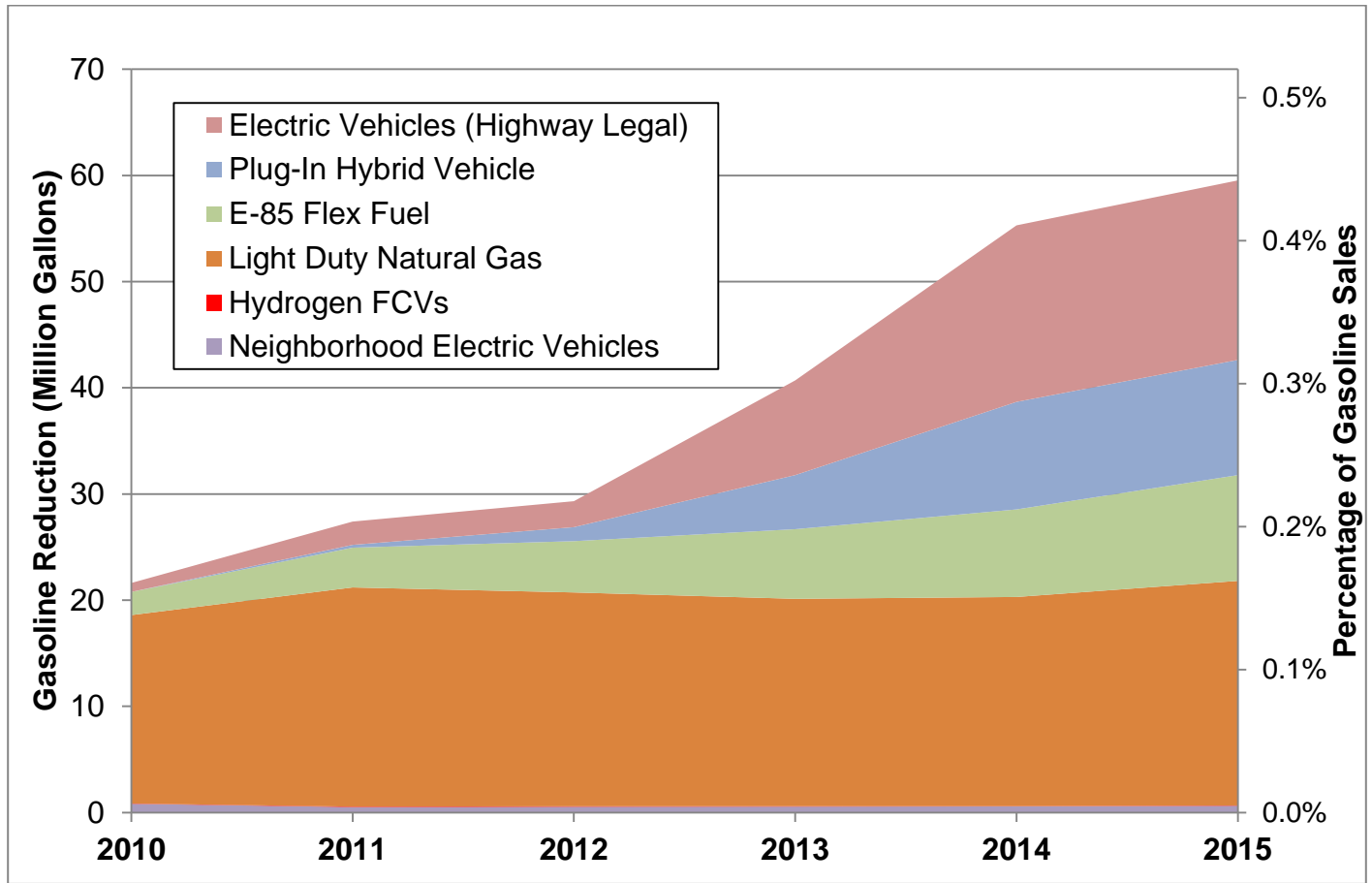
Source: PIIRA data

California diesel production remained within the five-year band for the week ending March 25, 2016, at 2.26 million barrels despite a weekly average decline of 114,250 barrels since February 26.

For 7 of the past 13 weeks, diesel inventories have been above the five-year band, averaging 4.04 million barrels for the first quarter of 2016. Unfortunately, this high first quarter average of diesel inventories finished with a 2016 low at 3.46 million barrels on March 25.

California Alternative Fuels Gasoline and Diesel Reduction

Figure 12: Gasoline Reduction From Alternative Fuels

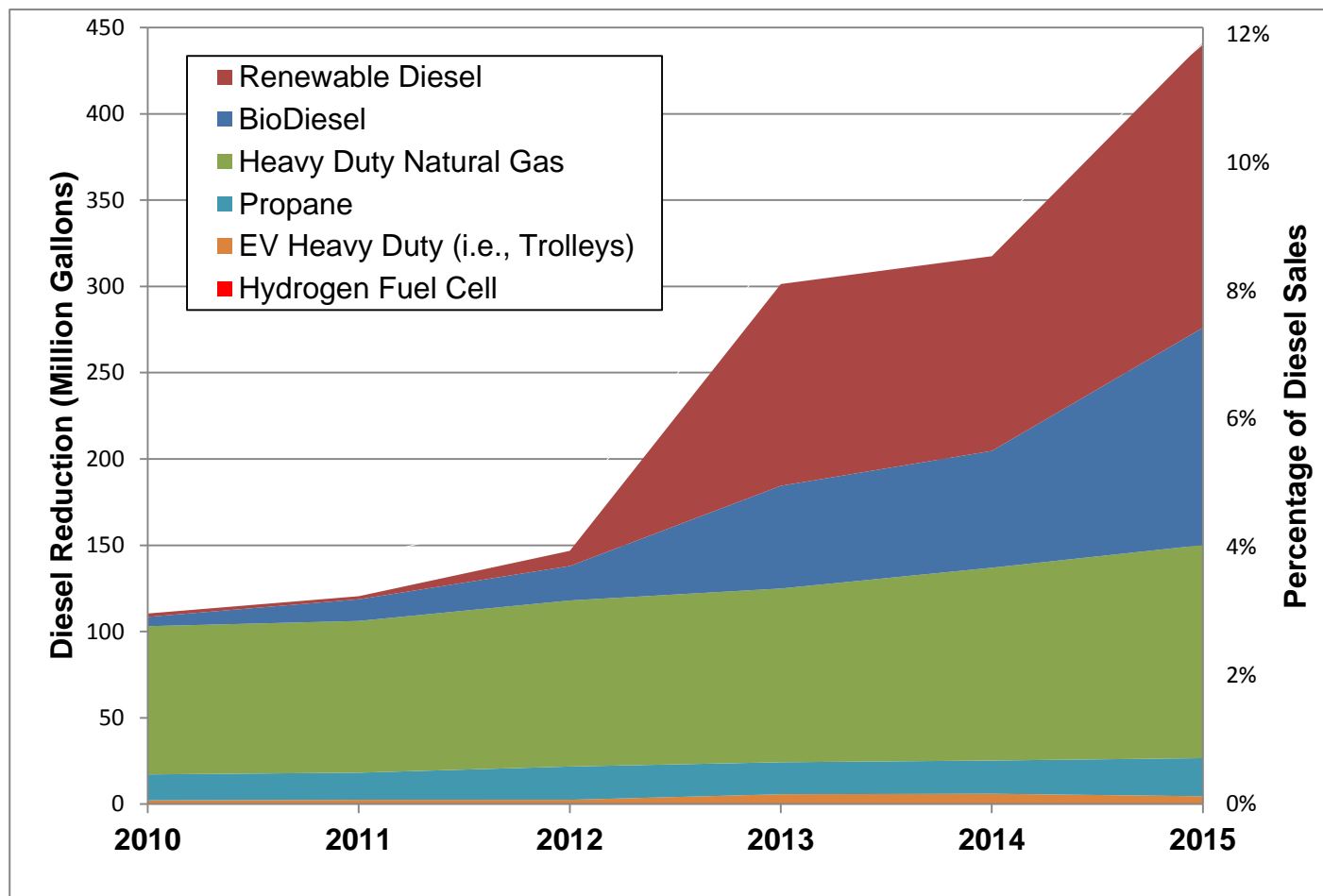


In 2015 alternative-fueled vehicles displaced 60 million gallons of gasoline, representing 0.44 percent of gasoline consumption (Figure 12). Alternative fuels gasoline displacement has been increasing for all fuels except natural gas. Hydrogen use and neighborhood electric vehicles gasoline reductions are shown at the bottom of the graph but may not be seen due to small reductions.

In addition to the above fuels, California also used 1.5 billion gallons of ethanol that was blended into conventional gasoline. This is the largest displacement of gasoline, accounting for more than 1 billion gallons of gasoline, which is 7.7 percent of gasoline consumption.² This ethanol is not included in Figure 12 because regulatory fuel specifications require it to be blended into gasoline for use by conventional gasoline-fueled vehicles.

² Although California gasoline contains 10 percent ethanol, this does not reduce gasoline consumption by 10 percent because one gallon of gasoline contains more energy than one gallon of ethanol. Therefore, a vehicle can travel farther on one gallon of gasoline than it can on one gallon of ethanol, and more ethanol must be consumed to travel the same distance.

Figure 13: Diesel Reduction From Alternative Fuels



Alternative fuel displacement of diesel is significant, at 441 million gallons. In 2015, consumption of diesel and diesel substitutes was 3.73 billion gallons, so alternative fuels displaced 11.8 percent of diesel consumption in 2015 (Figure 13). The diesel reduction of hydrogen use is shown at the bottom of the graph but may not be seen due to the small reduction.

Diesel displacement is so much higher than gasoline displacement for several reasons. While consumption of diesel substitutes is about seven times that of gasoline substitutes, it is also true that much more gasoline is consumed in California. This results in an even larger percentage displacement for diesel. Although biodiesel and renewable diesel are blended into petroleum-based diesel in the same way that ethanol is blended into conventional gasoline, there is no fuel specification requirement to do so. Even if both biodiesel and renewable diesel are removed from Figure 13, about 4 percent of diesel was displaced by other alternative fuels in 2015.