

PETROLEUM WATCH

CALIFORNIA ENERGY COMMISSION

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Indefinite Idling of Marathon
Martinez Refinery

REFINERY NEWS

• **Phillips 66 Wilmington:** On July 21, a mechanical failure caused flaring and black smoke at the refinery, according to the South Coast Air Quality Management District ([South Coast AQMD](#)) and the Los Angeles Times ([LA Times](#)).

• **Marathon Martinez:** On August 3, the company announced that it will indefinitely idle its Martinez refinery, converting it into a terminal facility, according to a statement posted on the company website ([Marathon Petroleum](#)).

CALIFORNIA GASOLINE RETAIL PRICES BY BRAND

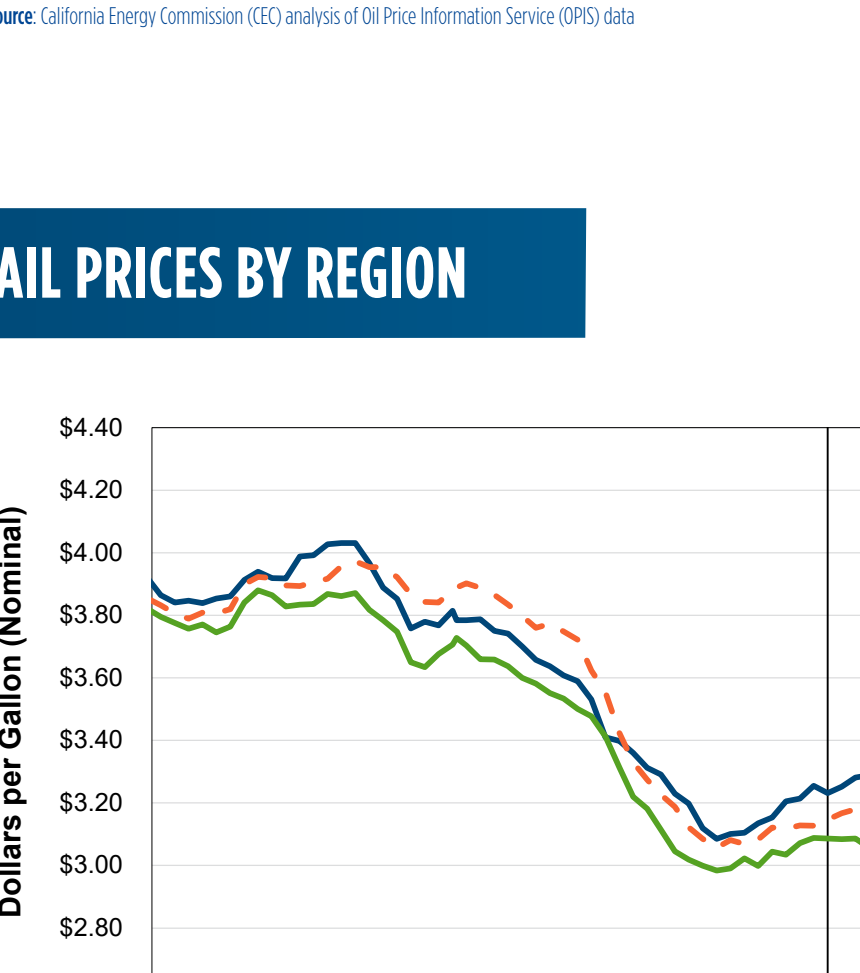
July 2020 vs. 2019

(Percentage Change)

76	17% lower
ARCO	16% lower
Chevron	15% lower
Hypermart	17% lower
Shell	16% lower
Unbranded	16% lower
Valero	16% lower

July 2020 Averages

76	\$3.18
ARCO	\$2.94
Chevron	\$3.30
Hypermart	\$2.85
Shell	\$3.25
Unbranded	\$3.02
Valero	\$3.11



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

CALIFORNIA DIESEL RETAIL PRICES BY REGION

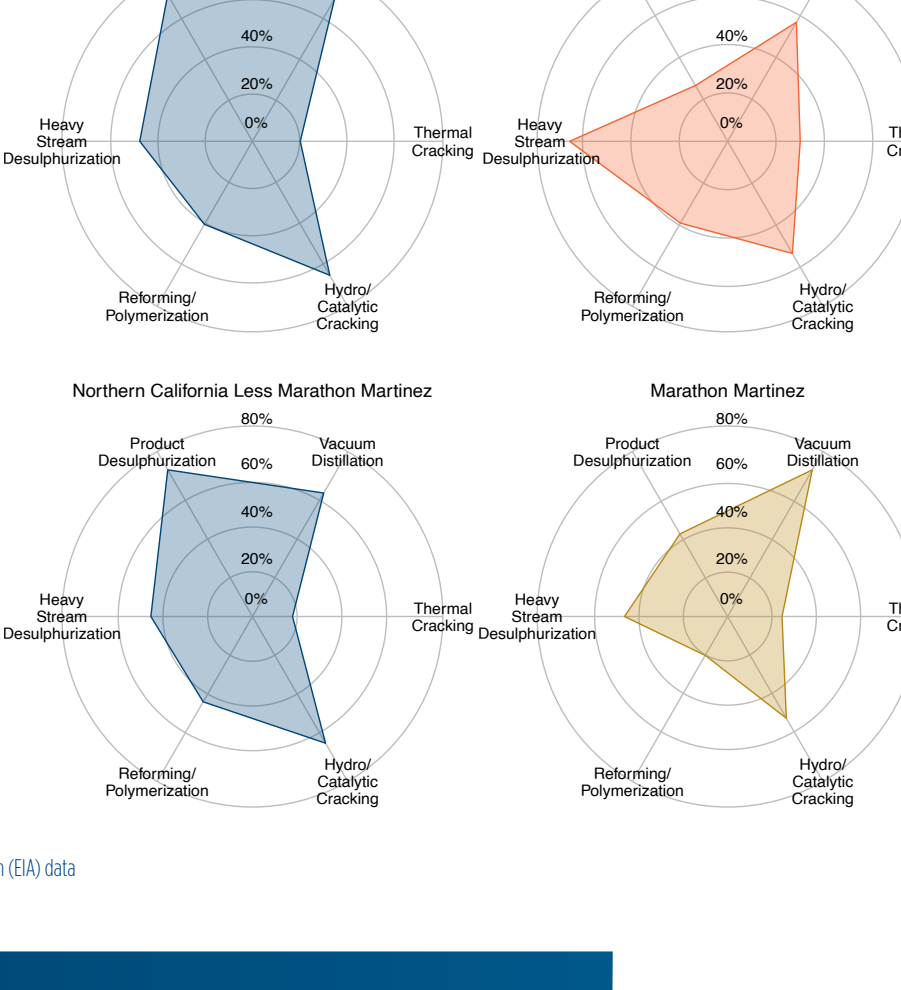
July 2020 vs. 2019

(Percentage Change)

Northern CA	18% lower
Central CA	20% lower
Southern CA	18% lower

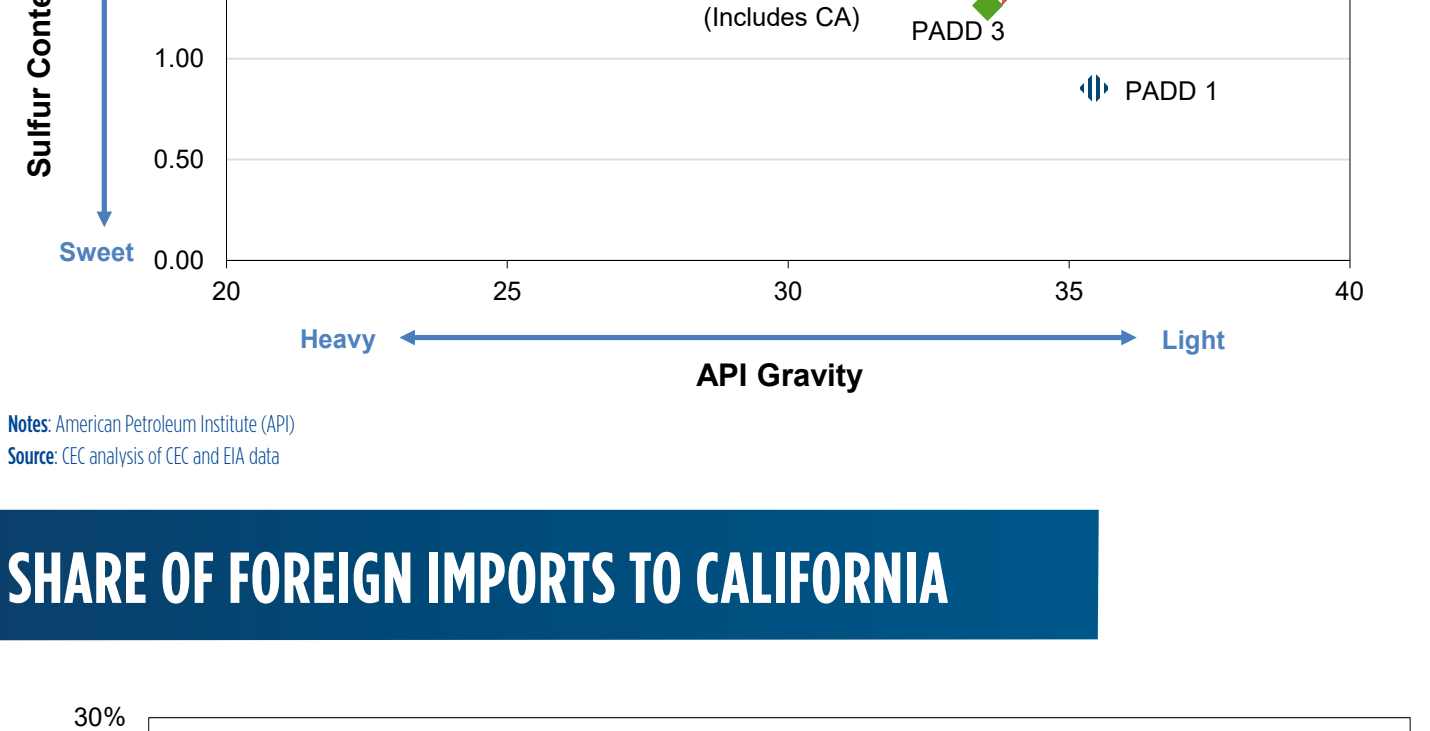
July 2020 Averages

Northern CA	\$3.26
Central CA	\$3.08
Southern CA	\$3.16



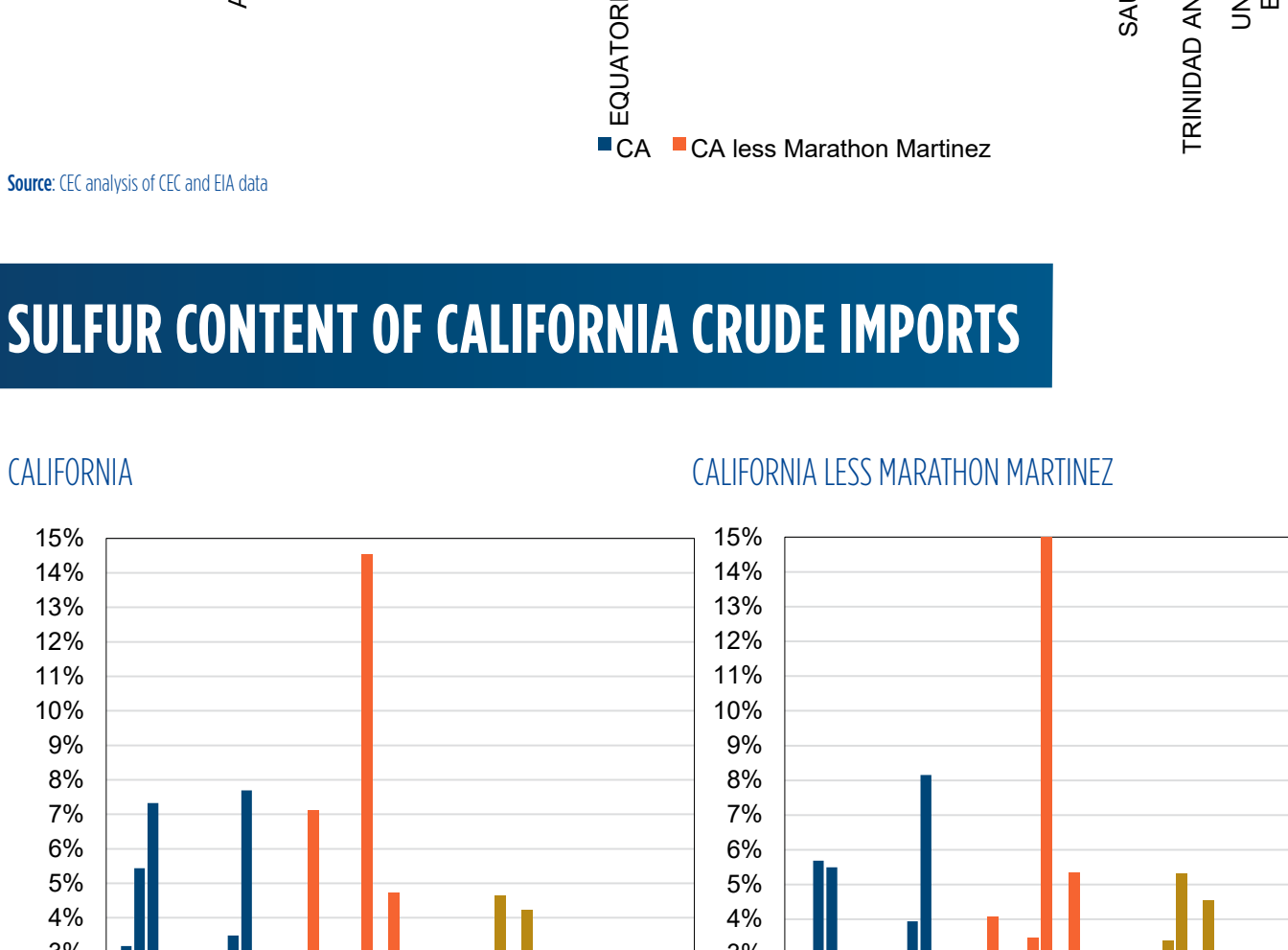
Source: CEC analysis of OPIS data

CALIFORNIA REFINERY PROFILE



Source: CEC analysis of CEC and U.S. Energy Information Administration (EIA) data

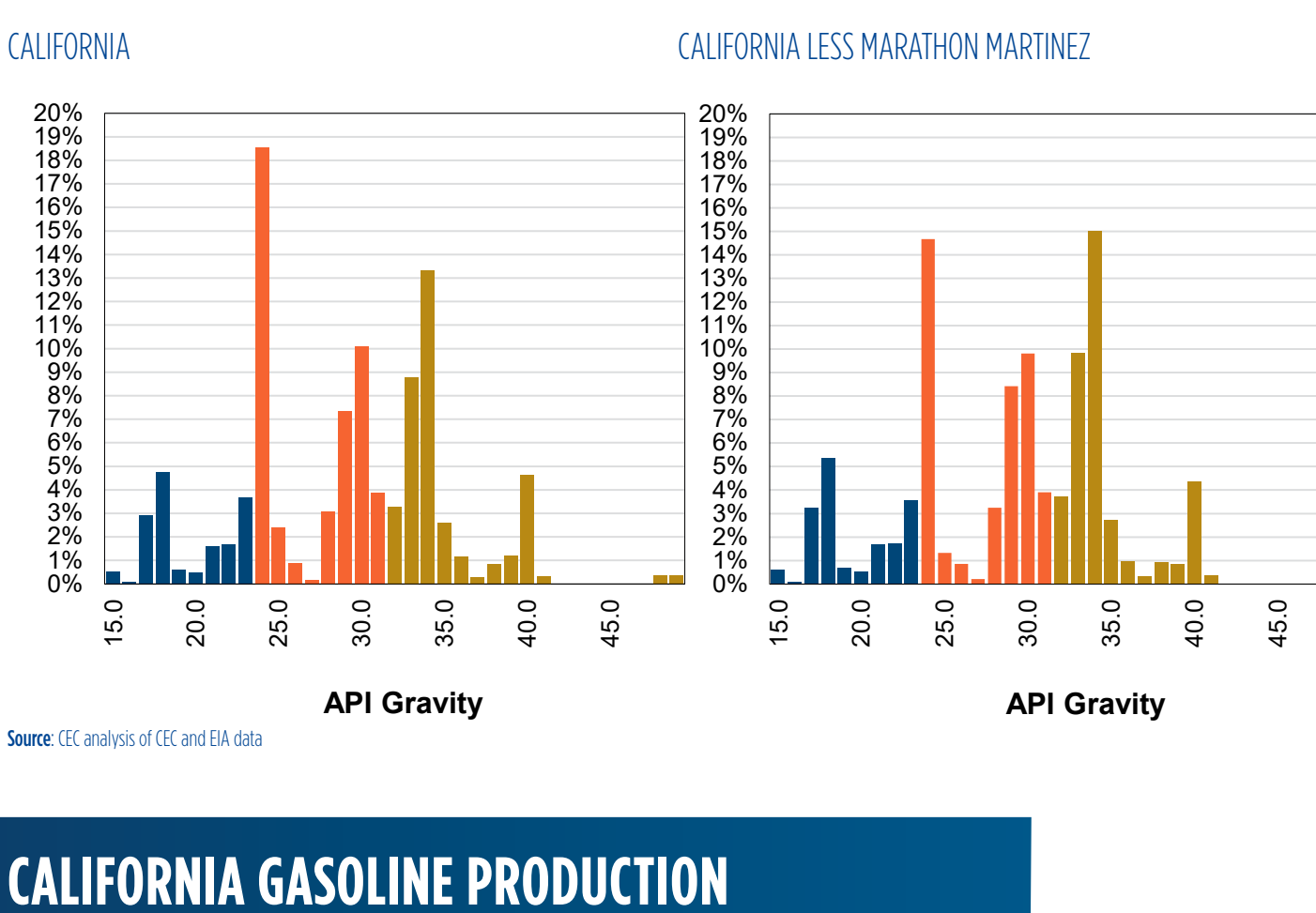
API GRAVITY & SULFUR CONTENT OF U.S. CRUDES



Notes: American Petroleum Institute (API)

Source: CEC analysis of CEC and EIA data

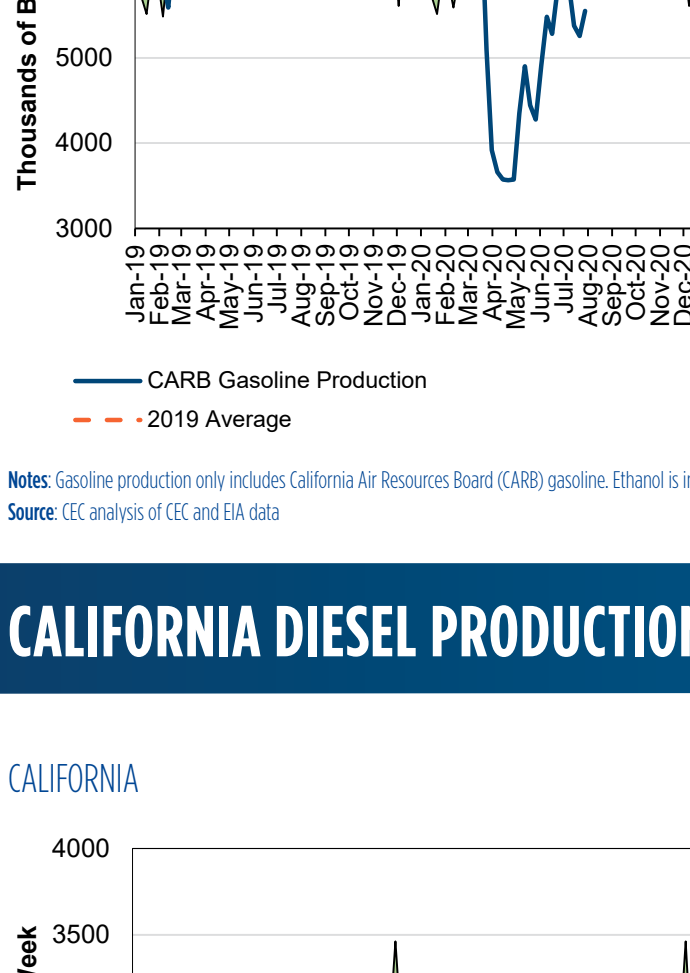
SHARE OF FOREIGN IMPORTS TO CALIFORNIA



Source: CEC analysis of CEC and EIA data

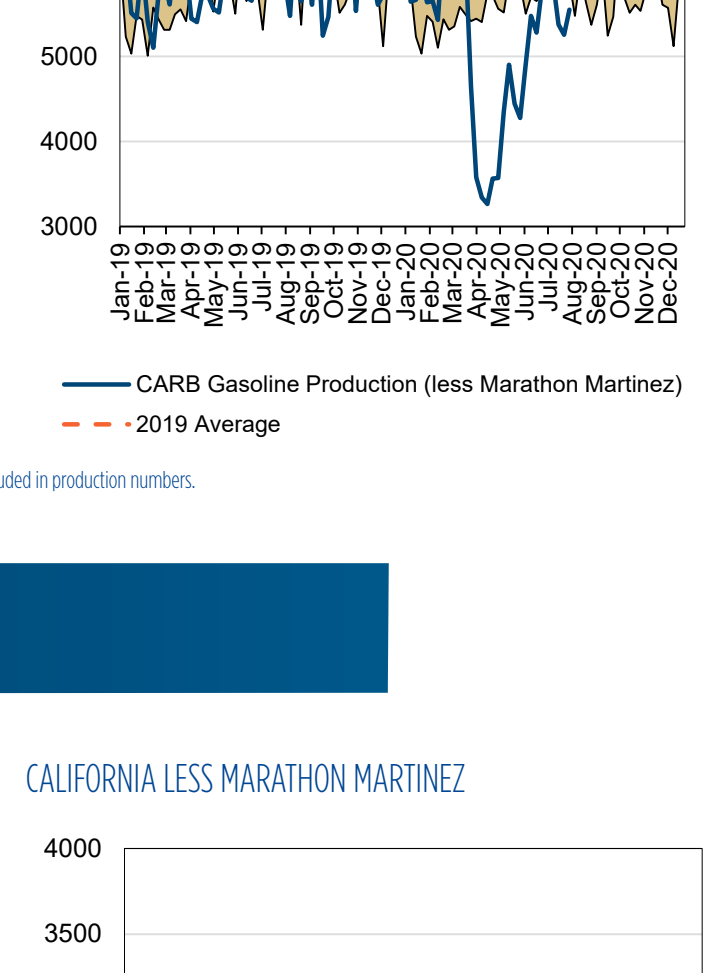
SULFUR CONTENT OF CALIFORNIA CRUDE IMPORTS

CALIFORNIA



Source: CEC analysis of CEC and EIA data

CALIFORNIA LESS MARATHON MARTINEZ



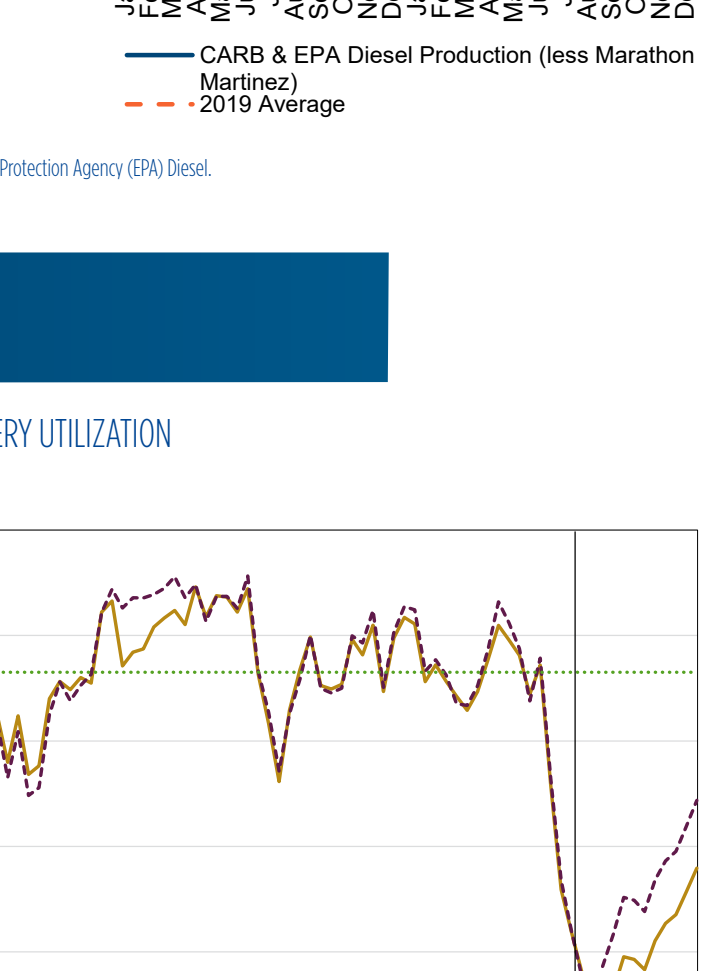
API GRAVITY OF CALIFORNIA CRUDE IMPORTS

CALIFORNIA



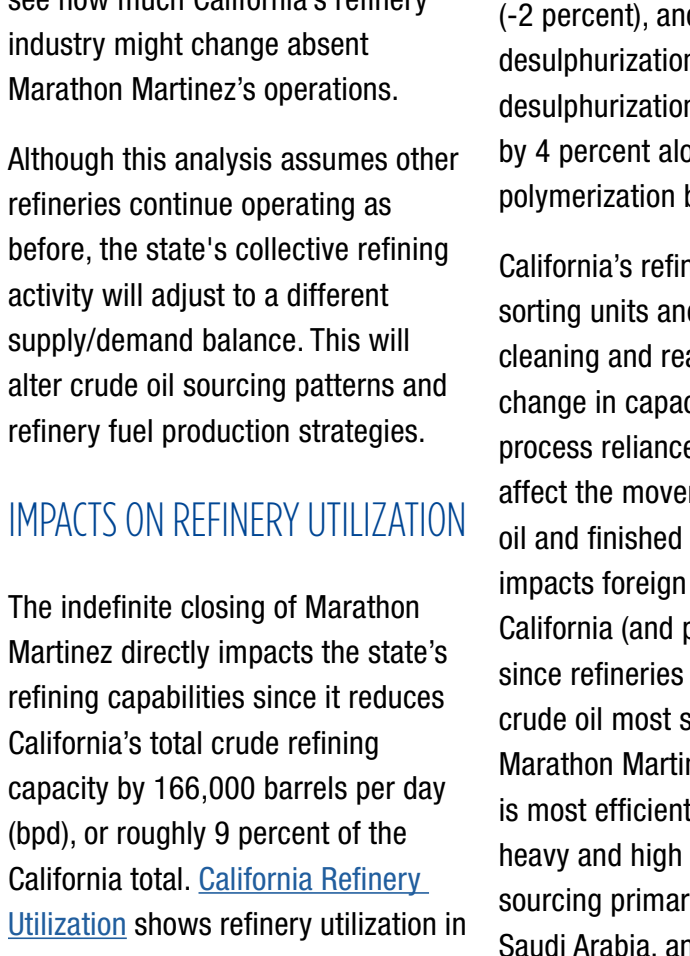
Source: CEC analysis of CEC and EIA data

CALIFORNIA LESS MARATHON MARTINEZ



CALIFORNIA GASOLINE PRODUCTION

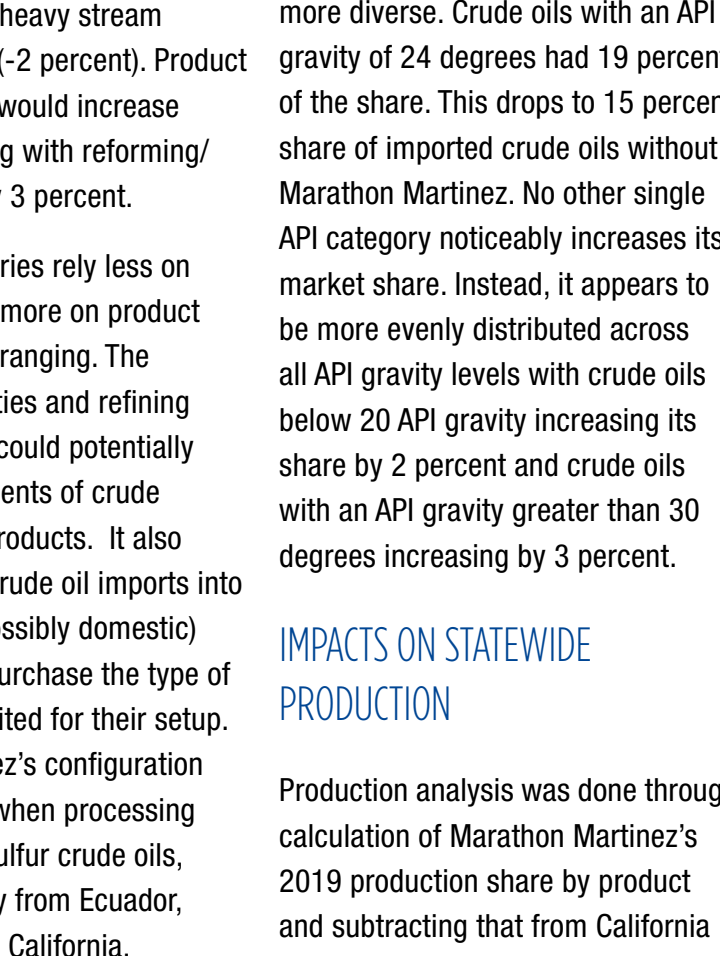
CALIFORNIA



Notes: Gasoline production only includes California Air Resources Board (CARB) gasoline. Ethanol is included in production numbers.

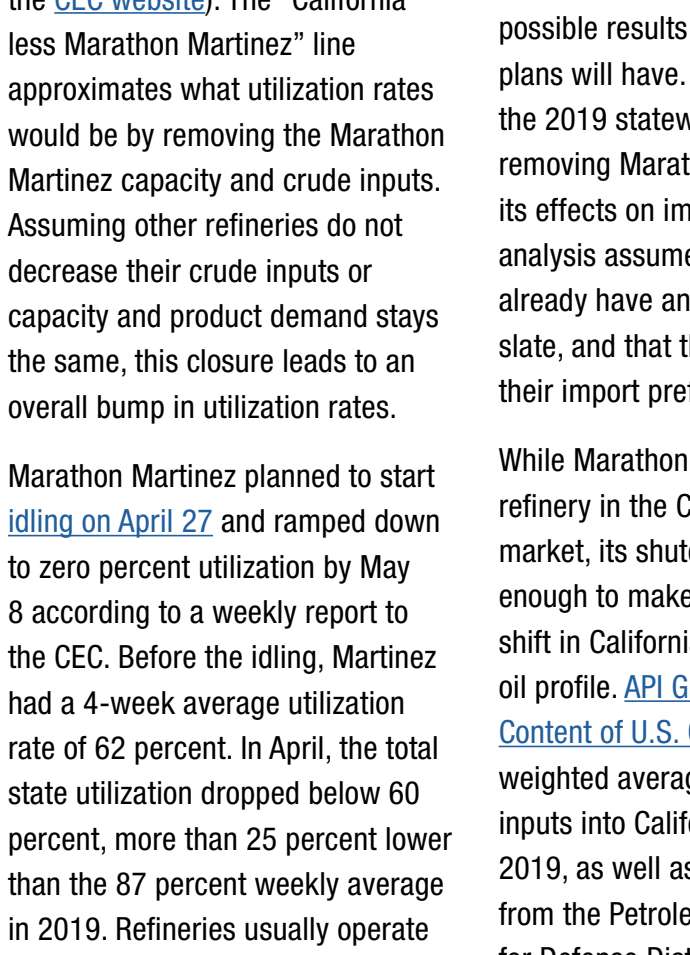
Source: CEC analysis of CEC and EIA data

CALIFORNIA LESS MARATHON MARTINEZ



CALIFORNIA DIESEL PRODUCTION

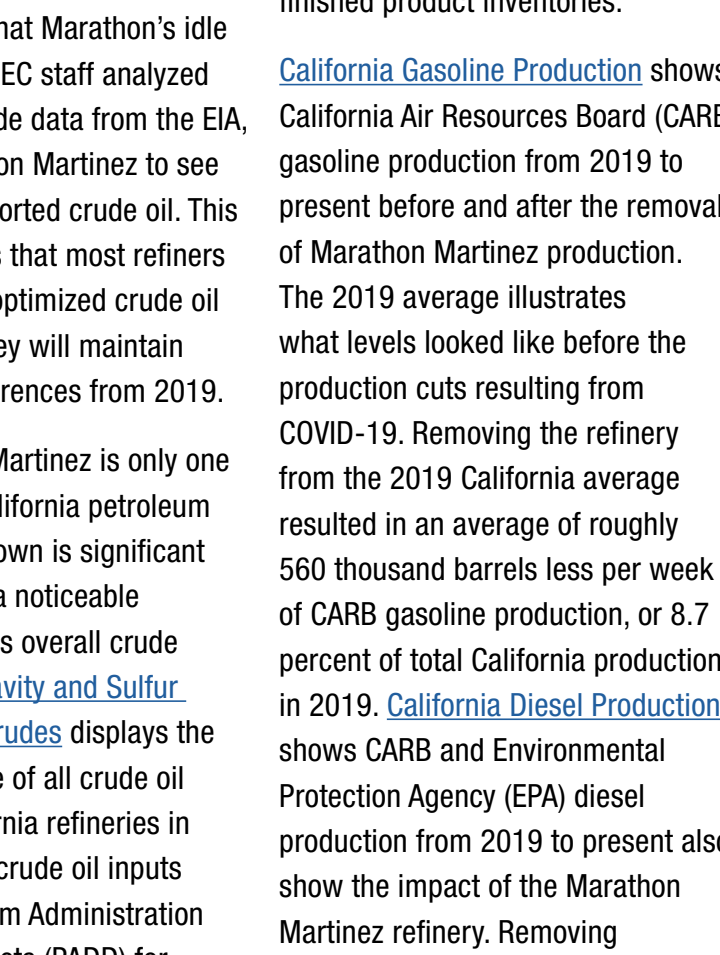
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Notes: Diesel Production only includes California Air Resources Board (CARB) Diesel and Environmental Protection Agency (EPA) Diesel.

Source: CEC analysis of CEC and EIA data

CALIFORNIA LESS MARATHON MARTINEZ



FEATURED TOPIC

INDEFINITE IDLING OF MARATHON MARTINEZ REFINERY

On August 3, Marathon Petroleum Company [announced that it will indefinitely](#) idle its refinery in Martinez in October 2020. Marathon already ramped down operations at the refinery on April 27 due to decline in demand caused by Coronavirus Disease 2019 (COVID-19). Marathon plans to use the facility's crude and product storage capacity for supplying other refineries in the area, effectively turning the location into a storage terminal until other operations are approved. California Energy Commission (CEC) staff have researched and prepared an initial analysis of refinery capacity, crude oil inputs, and production to see how much California's refinery industry might change absent Marathon Martinez's operations.

Although this analysis assumes other refineries continue operating as before, the state's collective refining activity will adjust to a different supply/demand balance. This will alter crude oil sourcing patterns and refinery fuel production strategies.

IMPACTS ON REFINERY UTILIZATION

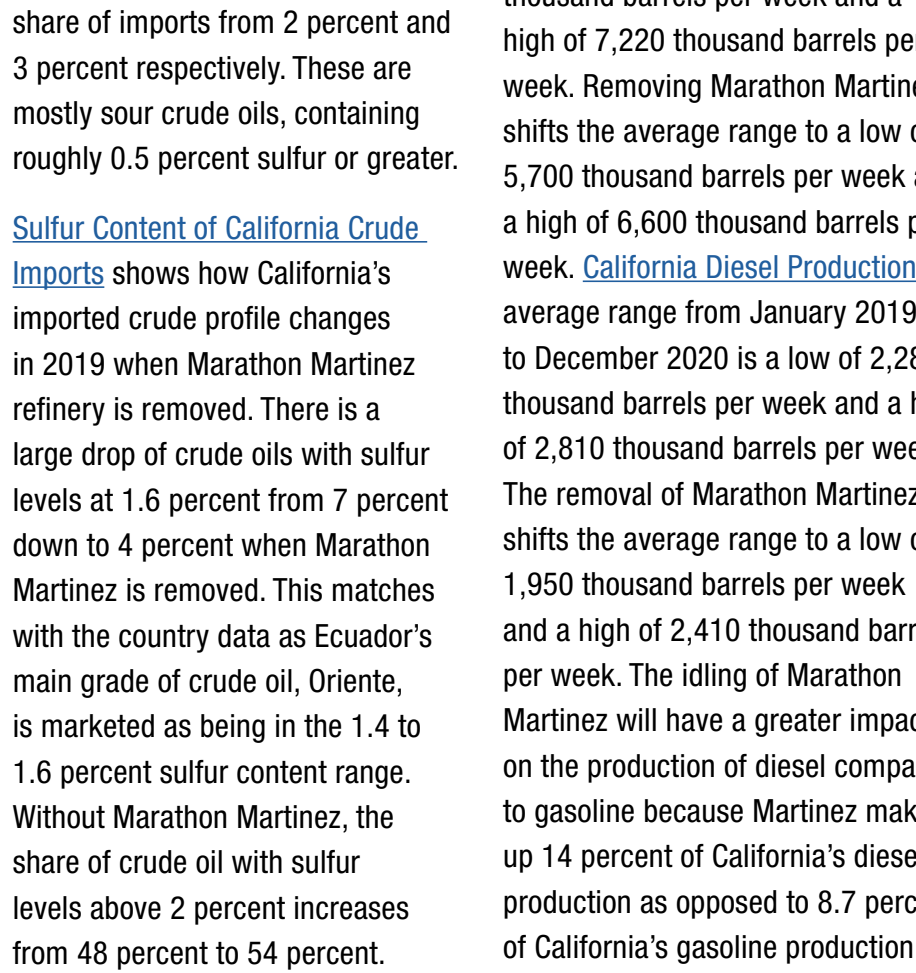
The indefinite closing of Marathon Martinez directly impacts the state's refining capabilities since it reduces California's total crude refining capacity by 166,000 barrels per day (bpd), or roughly 9 percent of the California total. [California Refinery Utilization](#) shows refinery utilization in California from 2019-to-present with and without the Marathon Martinez refinery. This analysis assumes that no other refineries shut down and that operations stay identical to 2019. The calculation for utilization rates is the weekly sum of crude inputs for all operating refineries divided by the total atmospheric distillation capacity (available on the [CEC website](#)). The "California less Marathon Martinez" line approximates what utilization rates would be by removing the Marathon Martinez capacity and crude inputs. Assuming other refineries do not decrease their crude inputs or capacity and product demand stays the same, this closure leads to an overall bump in utilization rates.

Marathon Martinez planned to start [idling on April 27](#) and ramped down to zero percent utilization by May 8 according to a weekly report to the CEC. Before the idling, Martinez had a 4-week average utilization rate of 62 percent. In April, the total state utilization dropped below 60 percent, more than 25 percent lower than the 87 percent weekly average in 2019. Refineries usually operate near full capacity or somewhere between 80 to 90 percent in order to maximize efficiency. Transportation fuel demand picks up in the summer, resulting in higher utilization rates (rates rose above the 2019 average between June 2019 and September 2019). The seasonal trend continued this year as refineries ran more crude leading into June, but rates remained below 70 percent.

The [May 2020 Petroleum Watch](#) explored refinery profiles at the state level by using radar graphs to show how much they relied on certain processes. [California Refinery Profile](#) shows California, Northern California and Marathon Martinez refinery downstream profile, before and after indefinite idling. This analysis uses [annual downstream capacities](#) from the Energy Information Administration (EIA) and assumes that no other refiner changed refinery operations from 2019. The Marathon Martinez refinery itself resembles the overall shape of the state's profile, relying primarily on vacuum distillation, hydro/catalytic cracking, and the desulfurization processes. Its removal from California's total pool mainly affects California's vacuum distillation and reforming/polymerization capacities by -3 percent and 1 percent, respectively.

The effect is more evident in Northern California since Marathon Martinez was a significant producer for the region. Taking out Martinez from the Northern California refinery

CALIFORNIA REFINERY UTILIZATION



Source: CEC analysis of CEC and EIA data

profile contracts the area, with reductions in vacuum distillation (-6 percent), thermal cracking (-2 percent), and heavy stream desulfurization (-2 percent). Product desulfurization would increase by 4 percent along with reforming/polymerization by 3 percent.

California's refineries rely less on sorting units and more on product cleaning and rearranging. The change in capacities and refining process reliance could potentially affect the movements of crude oil and finished products. It also impacts foreign crude oil imports into California (and possibly domestic) since refineries purchase the type of crude oil most suited for their setup. Marathon Martinez's configuration is most efficient when processing heavy and high sulfur crude oils, sourcing primarily from Ecuador, Saudi Arabia, and California.

IMPACTS ON CRUDE OIL IMPORTS AND INPUTS

California can expect a change in the pattern of imported crude oil with the closure of Marathon Martinez refinery. CEC staff analysis made assumptions based on past data to give a starting point on offering possible results that Marathon's idle plants will have. CEC staff analyzed the 2019 statewide data from the EIA, removing Marathon Martinez to see its effects on imported crude oil. This analysis assumes that most refiners already have an optimized crude oil slate, and that they will maintain their import preferences from 2019.

While Marathon Martinez is only one refinery in the California petroleum market, its shutdown is significant enough to make a noticeable shift in California's overall crude oil profile. [API Gravity and Sulfur Content of U.S. Crudes](#) displays the weighted average of all crude oil inputs into California refineries in 2019, as well as crude oil inputs from the Petroleum Administration for Defense Districts (PADD) for comparison. Removing Marathon Martinez crude inputs results in a shift to a slightly lighter API gravity, 26.1 degrees to 26.2 degrees, and higher sulfur content going from 1.7 percent to 1.8 percent.

These changes in overall crude oil properties are tied to the foreign sourced crude oils that most California refineries import. California acquires most of its foreign crude oil from Saudi Arabia, Ecuador, and Iraq. [Share of Foreign Imports to California](#) shows the most noticeable change is the drop in crude oil from Ecuador. Ecuador's share of total imports drops from 18 percent to 14 percent. Saudi Arabia and Iraq increase their share of imports from 2 percent and 3 percent respectively. These are mostly sour crude oils, containing roughly 0.5 percent sulfur or greater.

Sulfur Content of California Crude Imports

[Imports](#) shows how California's imported crude profile changes in 2019 when Marathon Martinez refinery is removed. There is a large drop of crude oils with sulfur levels at 1.6 percent from 7 percent down to 4 percent when Marathon Martinez is removed. This matches with the country data as Ecuador's main grade of crude oil, Oriente, is marketed as being in the 1.4 to 1.6 percent sulfur content range. Without Marathon Martinez, the share of crude oil with sulfur levels above 2 percent increases from 48 percent to 54 percent.

The changes in [API Gravity of California Crude Imports](#) shows the density of crude oil becoming slightly more diverse. Crude oils with an API gravity of 24 degrees had 19 percent of the share. This drops to 15 percent share of imported crude oils without Marathon Martinez. No other single API category noticeably increases its market share. Instead, it appears to be more evenly distributed across all API gravity levels with crude oils below 20 API gravity increasing its share by 2 percent and crude oils with an API gravity greater than 30 degrees increasing by 3 percent.

IMPACTS ON STATEWIDE PRODUCTION

Production analysis was done through calculation of Marathon Martinez's 2019 production share by product and subtracting that from California 2019 production by product. Because the refinery does not produce jet fuel, this analysis only looks at gasoline and diesel and assumes gasoline and diesel production at other refineries are similar to 2019 rates. Gasoline and diesel inventory levels are not projected. It assumes that Marathon Martinez's closure will not significantly impact California's finished product inventories.

[California Gasoline Production](#) shows California Air Resources Board (CARB) gasoline production from 2019 to present before and after the removal of Marathon Martinez production. The 2019 average illustrates what levels looked like before the production cuts resulting from COVID-19. Removing the refinery from the 2019 California average resulted in an average of roughly 560 thousand barrels less per week of CARB gasoline production, or 8.7 percent of total California production in 2019. [California Diesel Production](#) shows CARB and Environmental Protection Agency (EPA) diesel production from 2019 to present also show the impact of the Marathon Martinez refinery. Removing Martinez's diesel production meant an average of 355 thousand barrels less per week or 14 percent of California production in 2019.

In both figures, there is a downward shift of the high-low five-year ranges after removing Martinez's production share. This high-low range shows maximum and minimum values for that week over the past five years. The five-year ranges have been extended to December 2020 to estimate what production could look like assuming production returns to levels seen in 2019. In [California Gasoline Production](#), the average range from January 2019 to December 2020 is a low of 6,230 thousand barrels per week and a high of 7,220 thousand barrels per week. Removing Marathon Martinez shifts the average range to a low of 5,700 thousand barrels per week and a high of 6,600 thousand barrels per week. [California Diesel Production](#) average range from January 2019 to December 2020 is a low of 2,280 thousand barrels per week and a high of 2,810 thousand barrels per week. The removal of Marathon Martinez shifts the average range to a low of 1,950 thousand barrels per week and a high of 2,410 thousand barrels per week. The idling of Marathon Martinez will have a greater impact on the production of diesel compared to gasoline because Martinez makes up 14 percent of California's diesel production as opposed to 8.7 percent of California's gasoline production.

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