



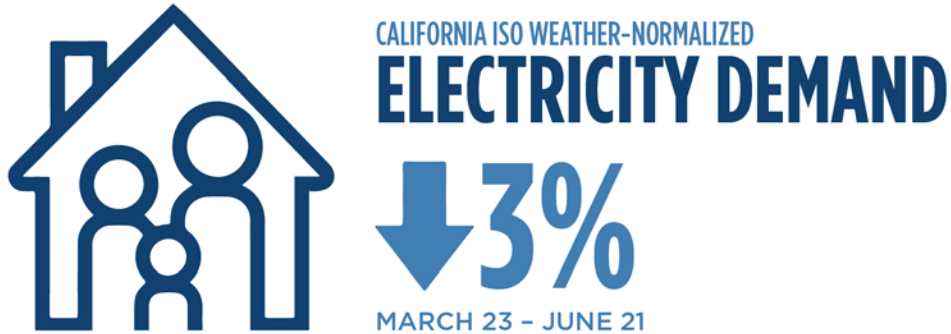
The California Energy Commission's (CEC) Energy Insights analysis provides a snapshot of trends in the energy sector, including impacts to energy supply and demand to the following sectors since Governor Gavin Newsom announced California's stay-at-home order on March 19, 2020.

- [Electricity Sector](#)
- [Natural Gas Sector](#)
- [Transportation Fuels Sector](#)

## Key Highlights

### Electricity Sector

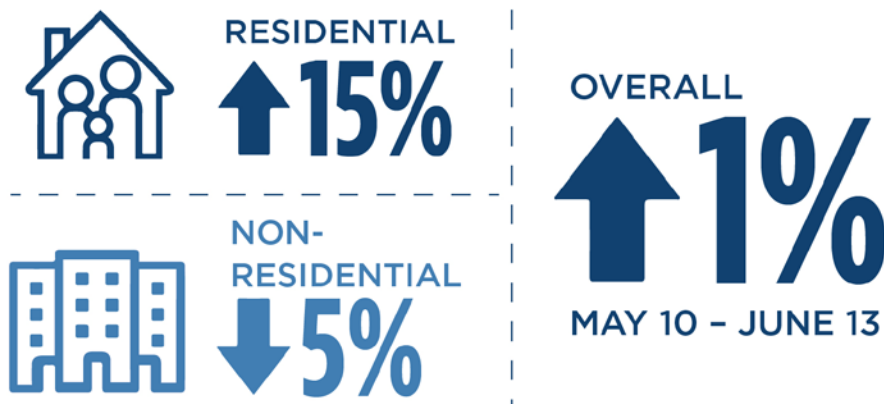
Demand in the California Independent System Operator territory has fallen relative to 2019 particularly during weekday morning and midday hours.



Hot spring weather increased late-afternoon and early-evening peak demand back to levels expected without the stay-at-home order.



Electricity consumption has shifted from nonresidential to residential during the stay-at-home order.



## Natural Gas Sector

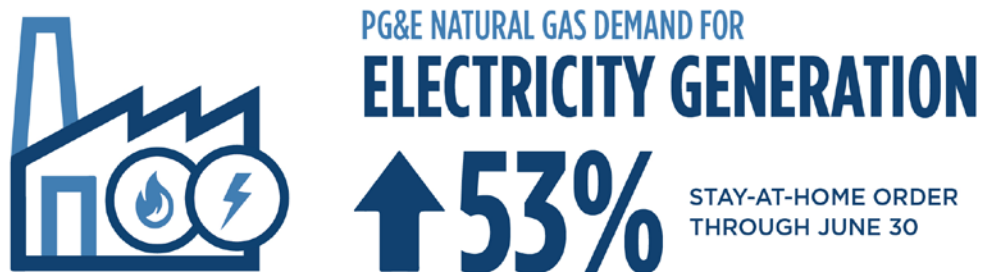
Natural gas demand returned to 2019 levels in recent weeks of the stay-at-home order.



Residential & small commercial, and industrial & large commercial demand declined, according to sector-level data from PG&E.

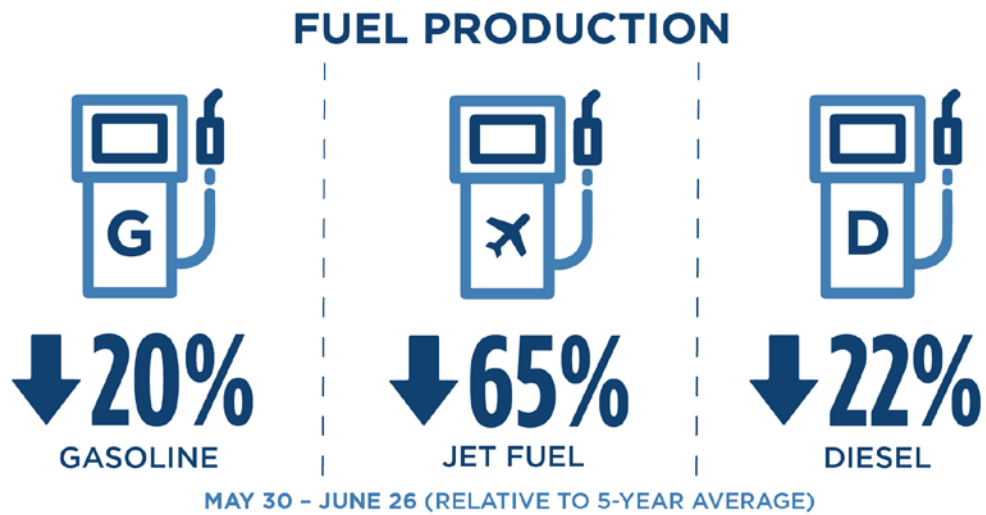


Because of hotter weather and lower hydroelectric resources this year, natural gas demand for electric generation increased relative to last year, according to sector-level data from PG&E.



## Transportation Fuels Sector

The decrease in demand for road and air travel since the stay-at-home order drastically slowed California jet fuel and gasoline output. Diesel was relatively unaffected until well into the stay-at-home order.



Reduced demand for travel since the stay-at-home order contributed to depressed gasoline and diesel prices, but both are beginning to increase in Stage 2 of the order.



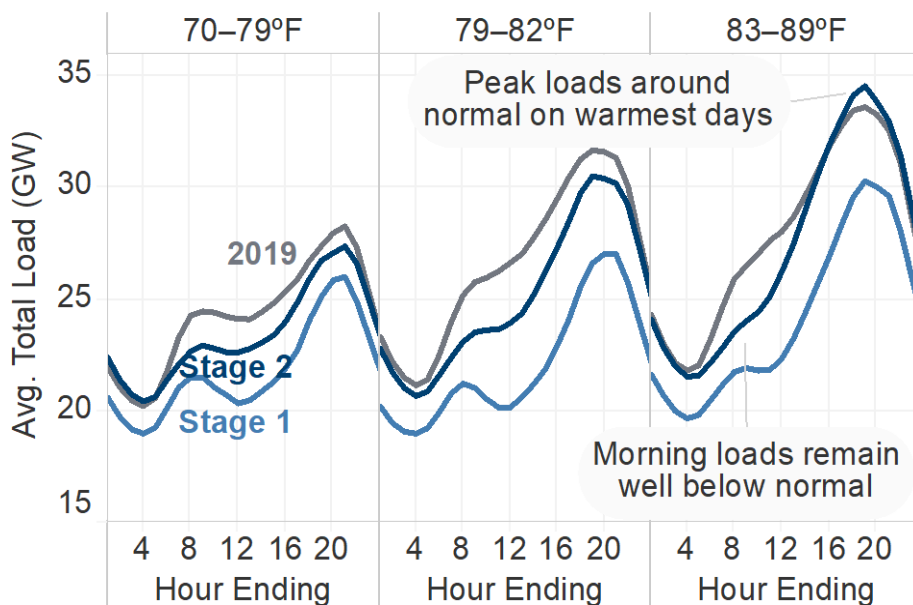
## Additional Analysis and Trends

### Electricity Sector

**Overall electricity consumption declined since the stay-at-home order, but peak demand bounced back in late April and May.** The California Independent System Operator (ISO) estimated a 3 percent decrease in weekday electricity demand from March 23 to June 21 after adjusting for weather. The decrease was greatest during the morning peak (6.1 percent) and evening peak hours (4.1 percent).

Electricity demand has started to rebound since entering Stage 2 of the stay-at-home order on May 9 but remains below 2019 levels. Figure 1 shows hourly electricity generation of days with similar temperatures in Stages 1 and 2 of the stay-at-home order, as well as during the same period in 2019. Overall, electricity consumption remains down. However, during the hottest afternoons, electricity consumption returned to levels expected without the stay-at-home order.

**Figure 1: California ISO Average Hourly Weekday Demand by Daily High Temperature, 2020 and 2019**

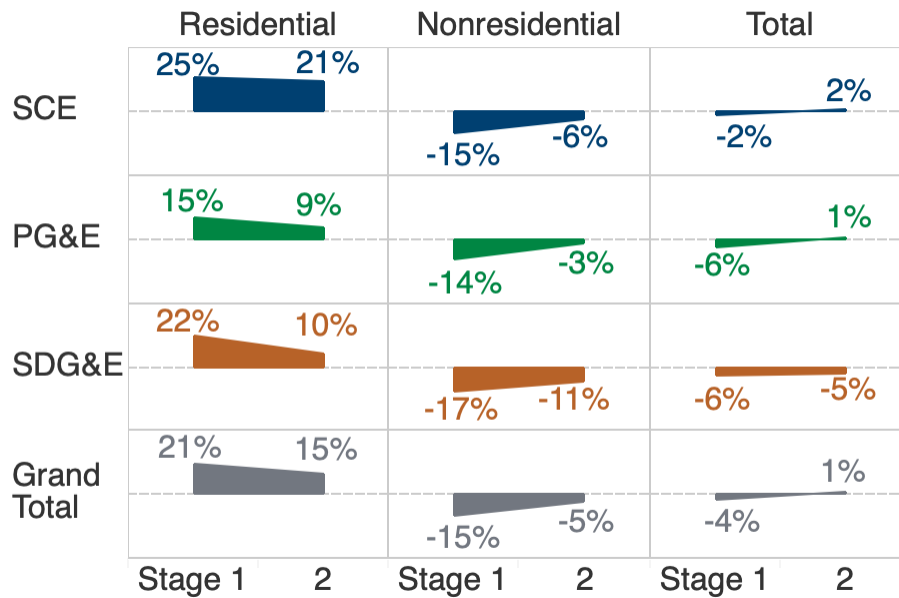


Source: California ISO Renewables Watch. *Daily high temperature is a weighted average of maximum daily temperatures across California. Values under 70 and over 89 are not shown because of the small number of observations.*

**Declines in nonresidential loads offset the increase in residential consumption.** During Stage 1 of the stay-at-home order, overall demand decreased 4 percent compared to 2019, which was driven by a 15 percent decrease in nonresidential demand across the three major investor-owned utilities (IOUs). However, increased time at home shifted energy consumption to the residential sector, which increased 21 percent.

This pattern of increased residential and decreased nonresidential consumption persists during Stage 2, but to a lesser extent. In Stage 2, the increase in residential loads now outweighs the decrease in nonresidential loads, leading to a year-over-year increase of 1 percent during this period.

**Figure 2: 2019–2020 Year-Over-Year Change in Electricity Consumption for Southern California Edison (SCE), Pacific Gas & Electric (PG&E), and San Diego Gas & Electric (SDG&E) by Sector, March 22 Through June 13**



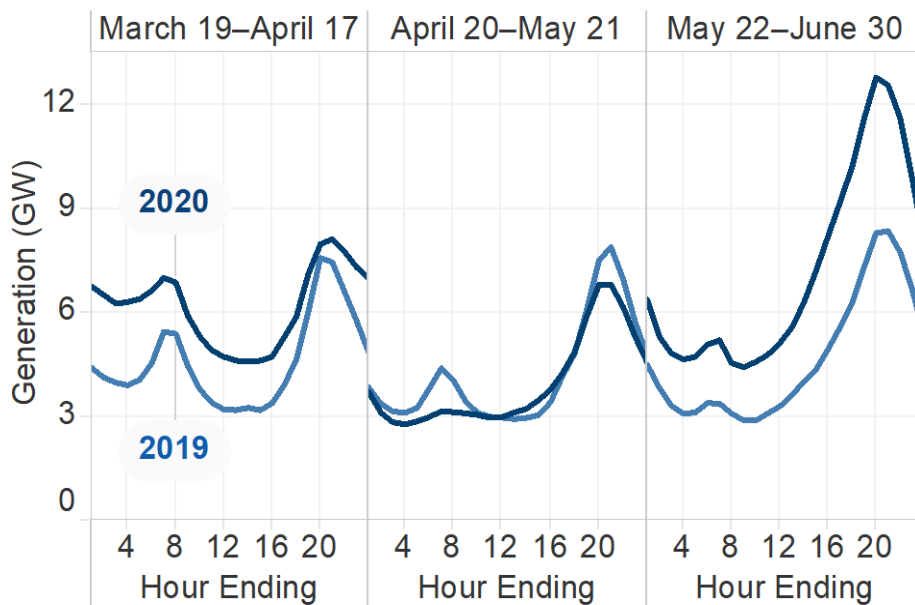
Source: California Public Utilities Commission (CPUC). PG&E Customer Usage impacts are preliminary, based on raw AMI data and subject to changes as updated data become available. PG&E data are not billing-quality, and only customers with interval meters are observed. SCE’s load impact by customer class is estimated based on representative samples and does not reflect actual billed usage.

**Natural gas generation has increased after the stay-at-home order despite the decline in electricity consumption.** Afternoon and peak loads driven by high temperatures from late May through June were met with natural gas-fired generation, as shown in Figure 2. Natural gas-fired generation increased 54 percent relative to 2019 during this period.

Despite the decrease in electricity demand during the four weeks immediately following the stay-at-home order, in-state natural gas generation increased during this period. This increase was driven largely by low in-state hydroelectric resources, which were down 57 percent (1.6 gigawatts [GW]) relative to the 2011–2019 average for March.

For about a month from late April through late May, natural gas generation dipped 6.7 percent below 2019 levels because of a 16 percent increase in imports during this period, even as California experienced two significant heat waves. Abundant out-of-state hydro generation from the Northwest contributed to increased imports during this time; estimates of flow on the Columbia River for April to September 2020 have been increased from 95 percent of normal to 103 percent.

**Figure 3: California ISO Average Hourly Weekday Natural Gas Generation March 19–June 30, 2020, and Corresponding Periods in 2019**



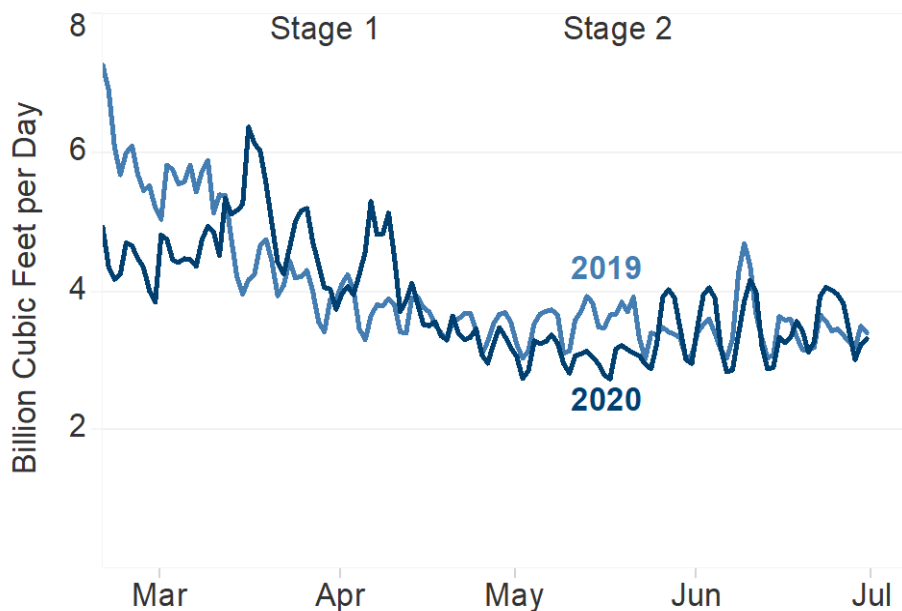
Source: California ISO Renewables Watch. California ISO’s “Thermal” generation type is shown here as natural gas, which constitutes virtually all California’s in-state thermal generation.

## Natural Gas Sector

**Natural gas use across PG&E and SoCalGas territories returned to 2019 levels in the most recent weeks of the stay-at-home order.** From May 26 through June 30, natural gas consumption was up just 1.6 percent compared to the same period last year, as shown in Figure 5. During this time, PG&E consumption was up 4.3 percent (2.3 billion cubic feet [Bcf]) and Southern California Gas (SoCalGas) was down 0.5 percent (0.3 Bcf).

From the stay-at-home order through April 20, PG&E consumption increased 13 percent (7.2 Bcf) and SoCalGas was up 11 percent compared to the same period in 2019. From April 21 through May 25, PG&E demand decreased 10 percent (5 Bcf) and SoCalGas decreased 12 percent (8.7 Bcf) relative to 2019.

**Figure 4: PG&E, SoCalGas, and Combined Natural Gas Demand, February 20–June 30 and Corresponding Period for 2019**



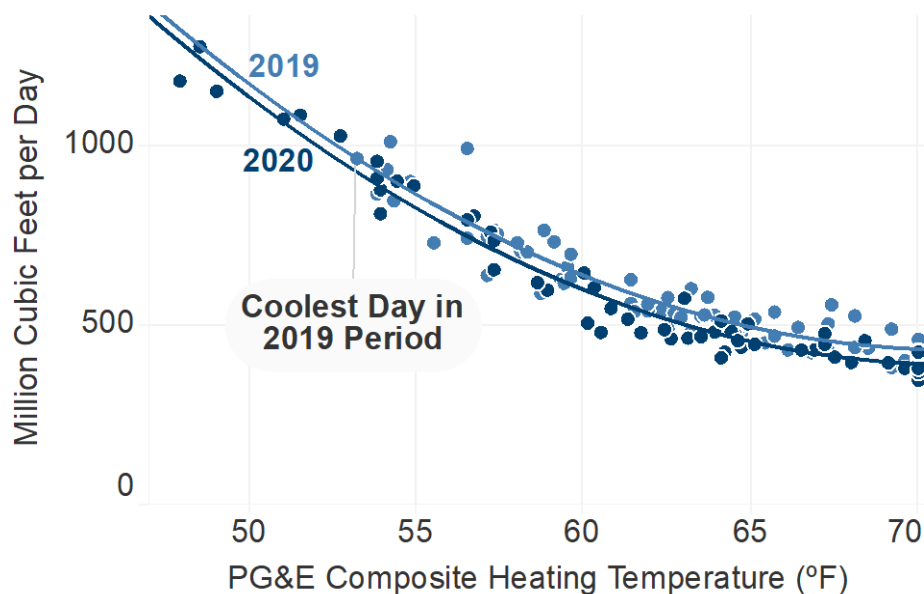
Source: PG&E Pipe Ranger, SoCalGas Envoy. Dates in 2020 have been matched to the corresponding weekday in 2019 to account for weekly patterns in demand.



**Residential and small commercial natural gas demand is down since the stay-at-home order after adjusting for weather where data are available.** Since the beginning of the stay-at-home order through June, PG&E weekday residential and small commercial demand declined 4.7 percent (27 million cubic feet, or MMcf, per day) compared to the same period in 2019 after adjusting for temperature, as shown in Figure 5. The residential and small commercial sectors are the primary users of natural gas for space and water heating, which are most sensitive to temperature. The cooler temperatures in late March and early April 2020 compared to the same period in 2019 contributed to increased the demand for heating.

While sector-level data are not available for other gas utilities, similar patterns are likely occurring throughout California. On weekdays with average temperatures of 70°F or less, overall natural gas demand for SoCalGas, which includes residential, commercial, industrial and electric generation demand, decreased 8.2 percent (192 MMcf/day) through June after adjusting for temperature.

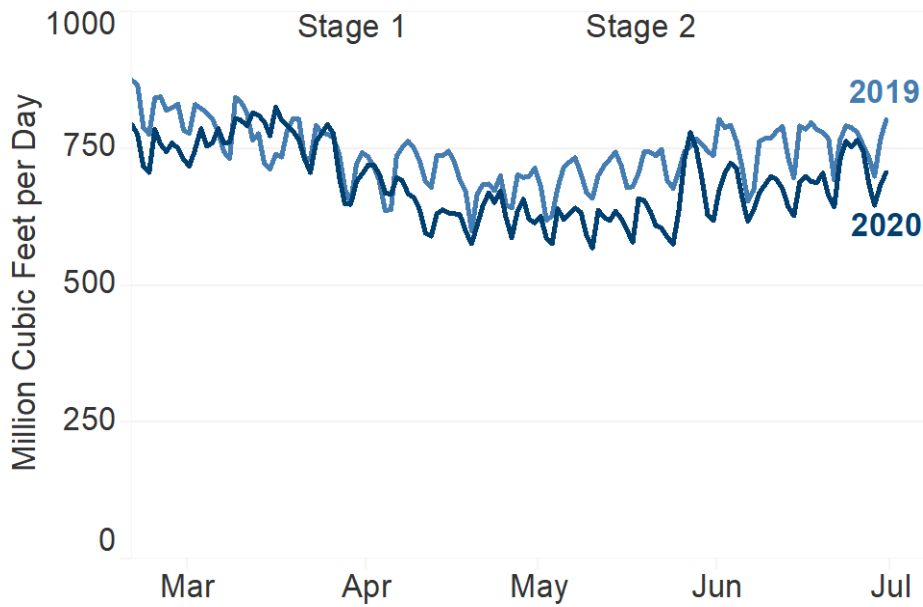
**Figure 5: PG&E Residential and Small Commercial Weekday Demand by Temperature, March 19–June 30, 2020, and Corresponding Period for 2019**



Source: PG&E Pipe Ranger. *Temperatures above 70°F are shown at 70°F, above which heating demand is not observable in the data. Dates in 2020 have been matched with the corresponding week and weekday in 2019 to account for weekly patterns in demand.*

**Industrial and large commercial natural gas demand remains below 2019 levels where data is available.** PG&E industrial and large commercial demand remained consistent with 2019 levels for the first few weeks of the stay-at-home order as customers gradually decreased operations. Daily demand has remained below 2019 levels since April 6 (except May 27), as shown in Figure 6.

**Figure 6: PG&E Industrial and Large Commercial Natural Gas Demand, February 20–June 30, 2020, and Corresponding Period for 2019**



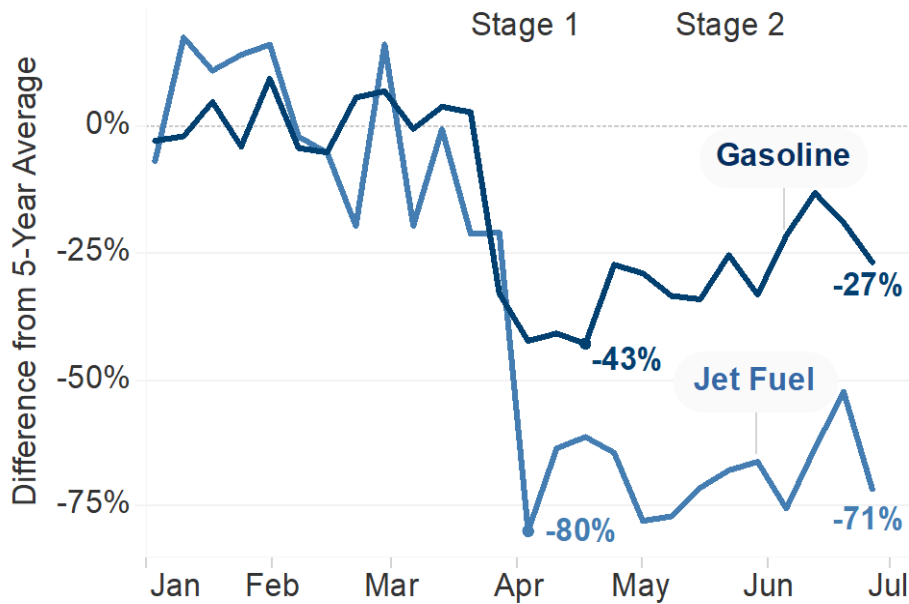
Source: PG&E Pipe Ranger. Dates in 2020 have been matched with the corresponding week and weekday in 2019 to account for weekly patterns in demand.

## Transportation Fuels Sector

**The decrease in demand for road and air travel since the stay-at-home order drastically slowed California jet fuel and gasoline output.** Weekly jet fuel net production (production minus changes in inventory) plummeted to 80 percent below the weekly five-year historical average shortly after the stay-at-home order was put in place. Net production has since hovered between 60 and 80 percent below. Gasoline net production also dropped sharply to a minimum of 43 percent below average in mid-April but hovered around 25 percent below in May and June.

In response to the decrease in demand since the stay-at-home order, one California refinery has been temporarily shut down since April 28, while others are operating at varying degrees of reduced operating levels.

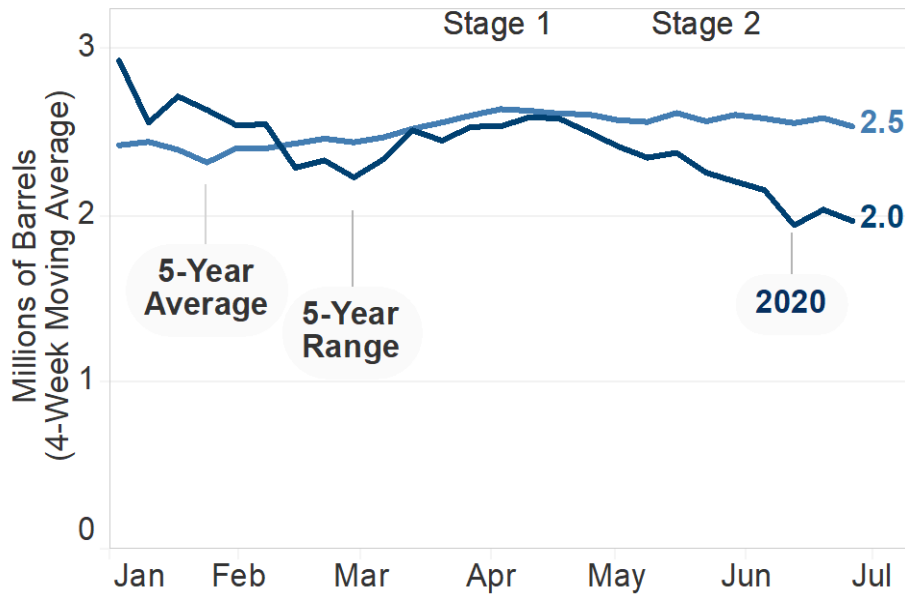
**Figure 7: California Refinery Gasoline and Jet Fuel Production, Percentage Difference from Five-Year Historical Average**



Source: CEC Fuels Watch. “Net production” is the weekly fuel production minus the change in inventory from the previous week to account for deliveries of fuel not produced in that week. Weekly production for 2020 is compared to the 2015–2019 average net production for the same week to account for seasonal and random variation in weekly production and changes in inventory.

**Diesel output shows demand was relatively unaffected until well into the stay-at-home order.** Demand for diesel fuel has been affected less by the stay-at-home order than other fuels as delivery and other commercial vehicles remained in service. However, the recent data shows diesel production slowly declining in response to tapering demand, as shown in Figure 8. From May 30 through June 26, net production was down 22 percent relative to the five-year average. The decline is likely driven in part by a decrease in shipping through California’s ports, where goods movement via trucking and rail is predominantly fueled by diesel.

**Figure 8: California Refinery Diesel Production Relative to Five-Year Historical Average (Four-Week Moving Averages)**

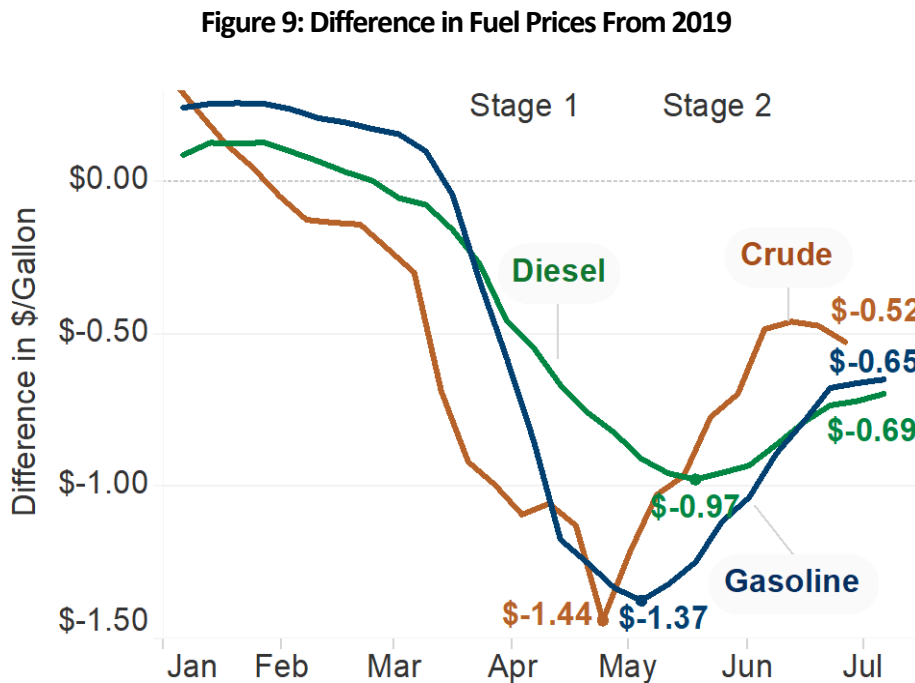


Source: CEC Fuels Watch. *The four-week moving average provides insight into gradual trends. Weekly production and inventory data are volatile, so the moving average smooths this random variation, allowing visualization of diesel production to slowly decline to below the five-year historical average.*

**Reduced demand for travel since the stay-at-home order contributed to depressed gasoline and diesel prices, but both are beginning to increase in Stage 2 of the order.**

The decline in demand and ensuing price war between major oil-producing countries (which predated California’s stay-at-home order) led to decreases in prices of crude oil and refined fuels, as shown in Figure 9. Crude oil dropped earliest, reaching a maximum year-over-year decrease of \$1.44 per gallon in April before bouncing back to around \$0.50 below in recent weeks.

Refined fuel prices respond both to crude oil prices and to changes in demand for the specific fuel. Following the price of crude, diesel prices dropped to nearly a dollar per gallon below 2019 prices. Gasoline prices fell further, to a minimum of \$1.37 below around the beginning of May because of decrease in demand for personal vehicle travel. On April 3, California’s average retail price for regular grade gasoline dropped below \$3 per gallon for the first time since August 2017. However, the price of gasoline has rebounded more than the price of diesel relative to last year as demand for personal vehicle travel picked up in Stage 2 of the stay-at-home order.



Source: Energy Information Administration, California Weekly Retail Gasoline and Diesel Prices and Weekly Crude Oil Prices. Prices are shown as differences from prices during the same week of 2019 to account for seasonal variations in fuel prices. Crude oil price is shown as the average of Brent and West Texas Intermediate Crude.

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