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Rising California Power Prices

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Data Sources Used in This Publication
Caiso
EIA
NGI
SoCalGas

Rising Power Prices

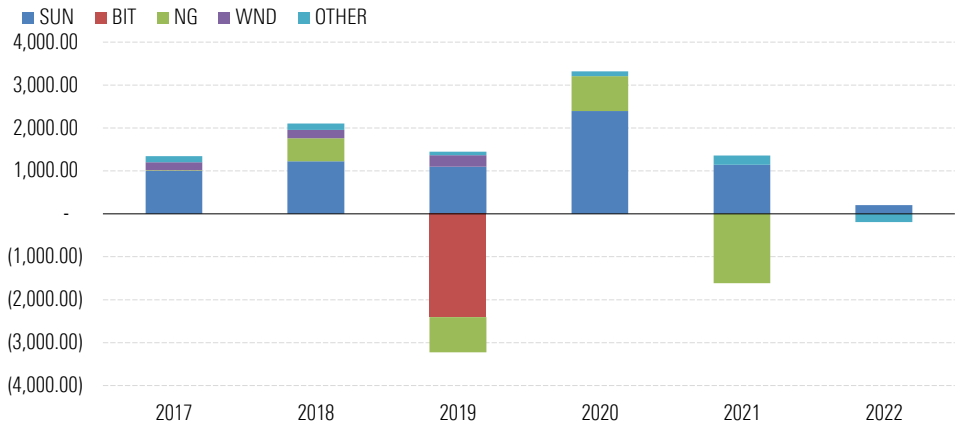
Over the past four years, power prices in Southern California have increased steadily year over year in both the peak and off-peak hours. Average power prices for the first three months of 2019 were up by 110% in the peak hours and 139% in the off-peak hours over the same period in 2016. Price changes between this year and last show an even more significant shift, with peak and off-peak prices up 48% and 64% respectively. This note suggests why prices had a stronger start this year compared to the recent past and provides our outlook for the coming summer season in Southern California.

Greater Renewable Penetration

In 2018, California and the surrounding region added 1,400 MW of solar and wind generation capacity. The trend toward more renewable generation, which is no surprise, is likely to continue over the next few years as California makes progress on aggressive goals to be carbon free by 2045 (Exhibit 1). The state is targeting a 60% renewable portfolio standard by 2030 with the remaining 40% of generation coming from zero-carbon generators by 2045.

Along with increased renewable generation, significant changes are expected for natural gas. In 2019, California and the surrounding area are expected to see a net loss of 800 MW of natural gas generation, with 2020 bringing a net addition of 800 MW. Also in 2019, while not in California, Navajo Generating Station, a bituminous coal plant is slated for retirement. While renewable generation has grown in California and the surrounding region, power prices in Southern California are higher this year, which goes counter to the idea that renewables push down power prices.

Exhibit 1 Net Generation Capacity by Prime Fuel Type (MW)

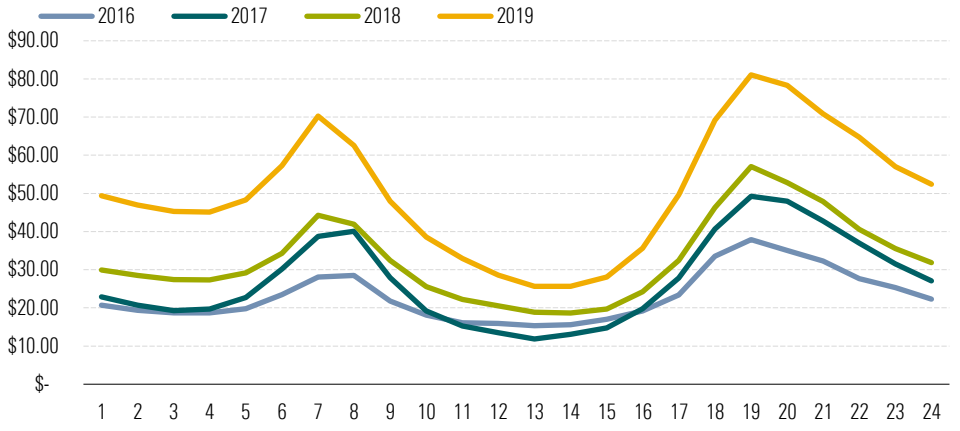


Source: EIA.

A Step Change

Average power prices in Southern California have increased throughout the day over the past four years, but the first three months of 2019 witnessed significantly higher levels (Exhibit 2). During the first quarter of 2019 average peak and off-peak day-ahead prices at SP15 were $49.02/MWh and $48.83/MWh, respectively. This compares with equivalents for first quarter of 2018 of $30.53/MWh and $34.10/MWh. These higher prices came despite increased renewable capacity that should have pushed down prices, especially during peak hours. A deeper look into Caiso generation patterns helps explain this anomaly.

Exhibit 2 Average Day-Ahead Prices by Hour for January-March at SP15 (2016–19)

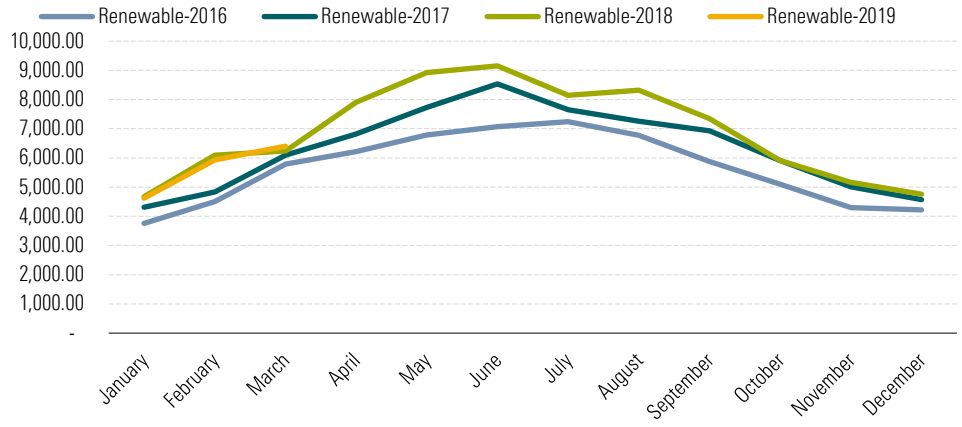


Source: EIA.

Caiso Generation

Looking first at renewable energy, monthly average generation for the first three months of 2019 mirrored 2018 closely (Exhibit 3). Average daily renewable generation for March was 6,400 MW, just 200 MW above March 2018 levels. Clearly the increase in day-ahead prices at SP15 year to date isn't being driven by additions to the renewable stack. In fact, the culprit is natural gas.

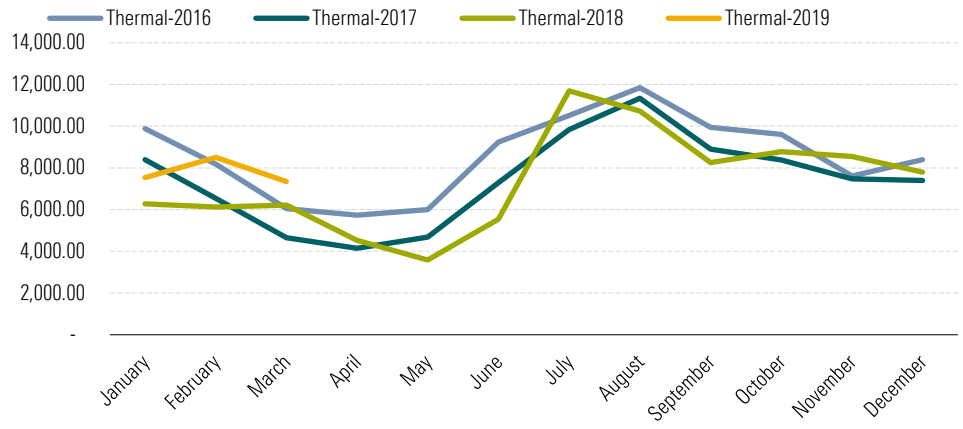
Exhibit 3 Monthly Average Generation—Renewable (MWh)



Source: Caiso.

Average thermal generation reported by Caiso in January, February, and March exceeded 2018 levels by 20%, 39%, and 18% respectively (Exhibit 4). A majority of the reported thermal generation comes from natural gas. Higher heating demand for natural gas in the 2018–19 winter season, lower storage levels, and continued operational pipeline challenges all pushed natural gas basis higher this year, leading to higher power prices. Average natural gas prices at SoCal Citygate in the first three months of this year were $6.68/mmbtu or nearly $3/mmbtu higher than the same period in 2018. At the same time the three-month average heat rate was only slightly higher in 2019 at 7.9 Mwh/mmBtu versus 7.5 Mwh/mmBtu in 2018, which points toward natural gas as the culprit behind the higher price of power at SP15.

Exhibit 4 Monthly Average Generation—Thermal (MW)

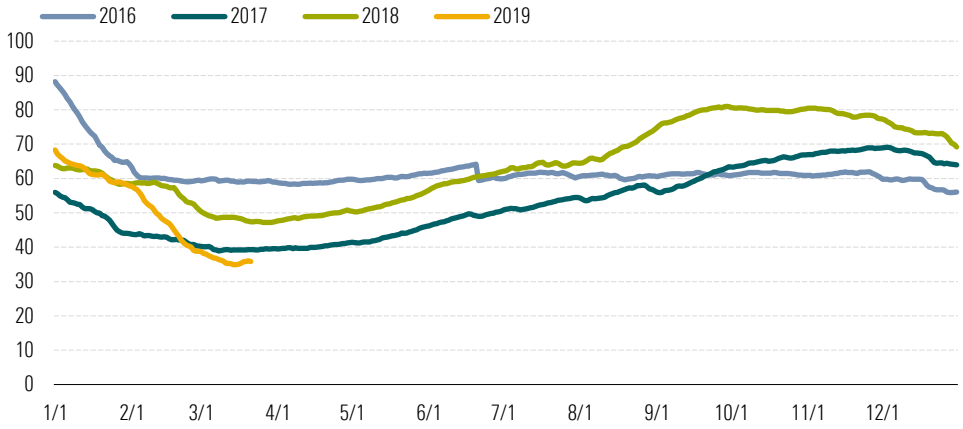


Source: EIA.

California Summer

So, what do we expect for the coming summer season? According to NOAA latest March forecast, California's summer is expected to exceed historical cooling degree day norms this year in June, July, August, and September by eight, 27, 18 and 11 days respectively, which signals stronger than normal demand. Natural gas storage levels, however, are still very low compared with past years (Exhibit 5). Storage inventories according to Southern California Gas are around 36 Bcf, which is three Bcf lower than the lowest point seen in the past three years. If Southern California can inject at the five-year monthly average, inventory levels in June, July, August, and September will reach 56 Bcf, 61 Bcf, 66 Bcf, and 71 Bcf respectively, which would still fall short of month-end inventory levels seen last year. The risk of a gas supply shortage grows if demand trends higher than expected, and operational challenges persist through the summer.

Exhibit 5 Daily Southern California Storage Levels (MW)



Source: SoCalGas

Hydro Rescue

Lower inventories and higher natural gas prices in Southern California may not translate to higher power prices this summer. That's because a large portion of California's generation comes from hydro assets, and late winter precipitation this year has built healthy snowpack levels. Statewide snowpack currently sits at 156% of the historical average, which indicates that hydro generation should be strong this year. Good hydro availability should limit the upside to SP15 day-ahead power prices going into the summer, despite the risk of higher natural gas prices at SoCal City-gate.

Conclusion

Southern California power prices started 2019 with a clear step up, primarily because of increases in thermal generation. Whether that shift will hold through the high demand summer is a more complex question. While lower natural gas inventories and continued challenges on the pipeline system could push Southern California basis prices up, the strong snowpack and expansion in renewables may temper any upside in power prices this summer.

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