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California Energy Commission

Transportation Fuel Price Forecasts For the 2019 IEPR

Inputs and Assumptions for Transportation Energy Demand Forecasts

Rosenfeld Hearing Room

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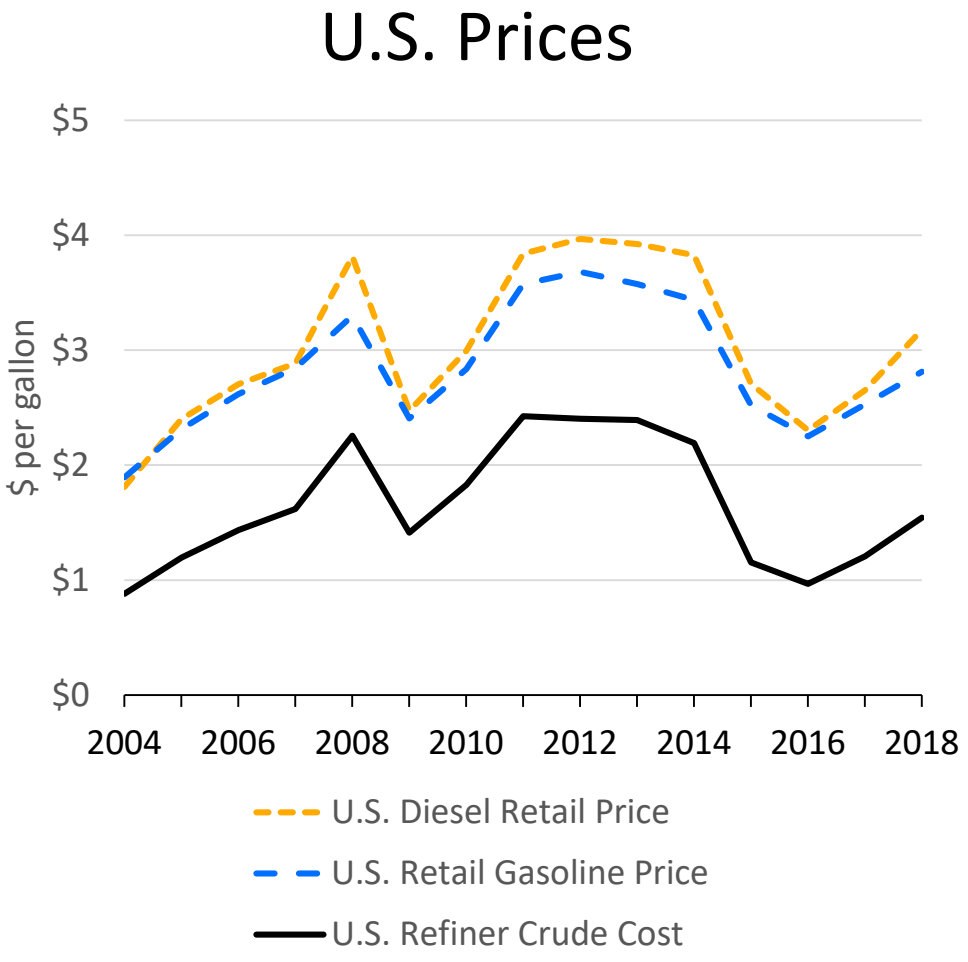
Fuel Price Forecast Process

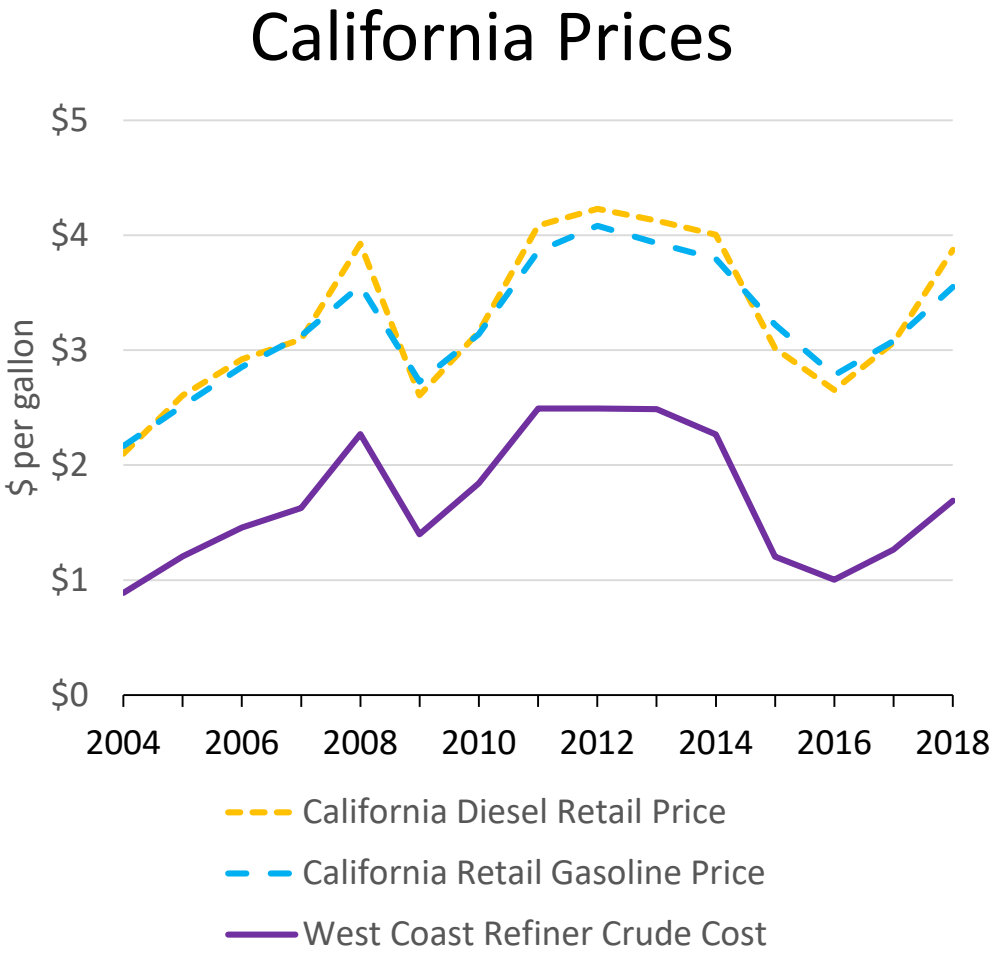
- Basic process makes “California Adjustments” to the EIA nationwide fuel price forecasts; there is no “California Forecast”
- Staff proposes to use three EIA Annual Energy Outlook (AEO) 2019 projections—reference, high oil price, low oil price—supplemented by EIA’s Short Term Energy Outlook (STEO)
- Consult with Commission experts on prices for natural gas and electricity, and with NREL experts for hydrogen prices
- EIA’s Nationwide Jet Fuel price forecast is used for the California forecast since the historical prices have been almost identical
- E-85 price forecast is assumed to equal the gasoline price forecast on an energy equivalent basis
- Solicit expert advice from workshop participants

What is the California Adjustment?

- California fuel prices are generally higher than in the rest of the country; the adjustment is composed of various factors that cause California prices to be higher
- Each individual adjustment explains how California fuel prices differ from nationwide averages: differences in taxes, the cost of crude oil, and so forth
- Many of these factors can be quantitatively predicted based on historical values
- Today will discuss gasoline, diesel, and briefly, propane

Crude and Fuel Prices Move Similarly





Source: U.S. Energy Information Administration

Method for Forecasting California Fuel Prices

- Use past prices and relationships to predict future prices; assumes these relationships will continue in future
- Specifically, the California price forecast is produced with an Ordinary Least Squares regression using annual historical data
- For gasoline and diesel: only 15 years of this data; results confirmed by carrying out same analysis on a monthly basis (180 months); obtained essentially the same results
- Propane has much less data available

Variables in Forecasting California Fuel Prices

US [gasoline/diesel] price

California adjustments

- California [gasoline/diesel] sales tax
- California [gasoline/diesel] excise tax
- Underground Storage Tank Fee
- Low Carbon Fuel Standard credit price
- carbon allowance price
- difference of refiners cost of crude
- Torrance refinery outage variable (gasoline only)

California Fuel Sales and Excise Taxes

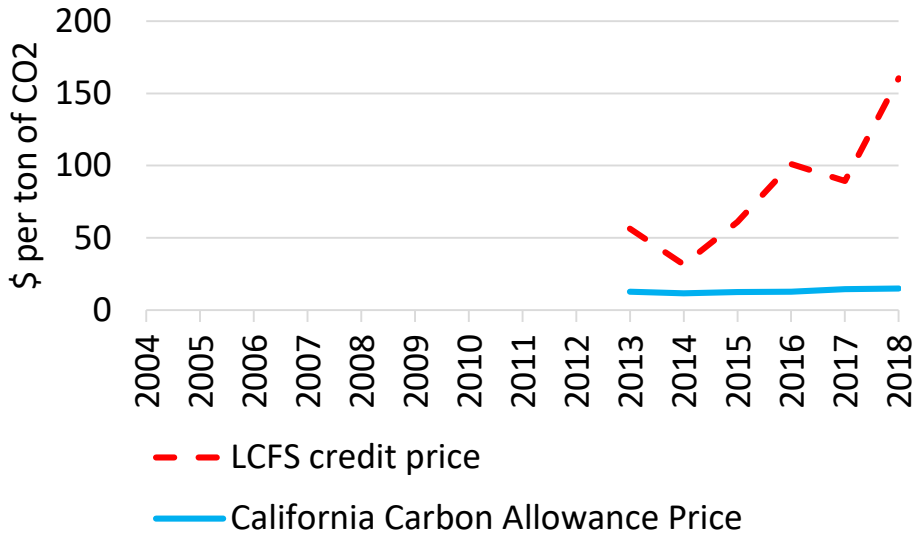
- Forecast uses current and future fuel taxes from California Department of Tax and Fee Administration
- Beginning on 1 July 2020, excise taxes will be adjusted for inflation annually
- Assume sales taxes and UST fee do not change

2019	State Sales Tax	State Excise Tax (¢/gallon)	Underground Storage Tank Fee (¢/gallon)	Total tax at $3 per gallon (¢/gallon)
Gasoline	2.25%	41.7	2	50.45
Diesel	13%	36	2	77

Carbon Allowance and LCFS Credits

- Carbon allowance price has a price ceiling and a reserve price
- Forecast by SAO staff
- LCFS credit price has a soft cap, which is the high scenario price
- The allowance and credits work in different ways, so price is not an indicator of relative compliance cost
- Price is zero until 2013, which makes it hard to determine their impact on fuel prices

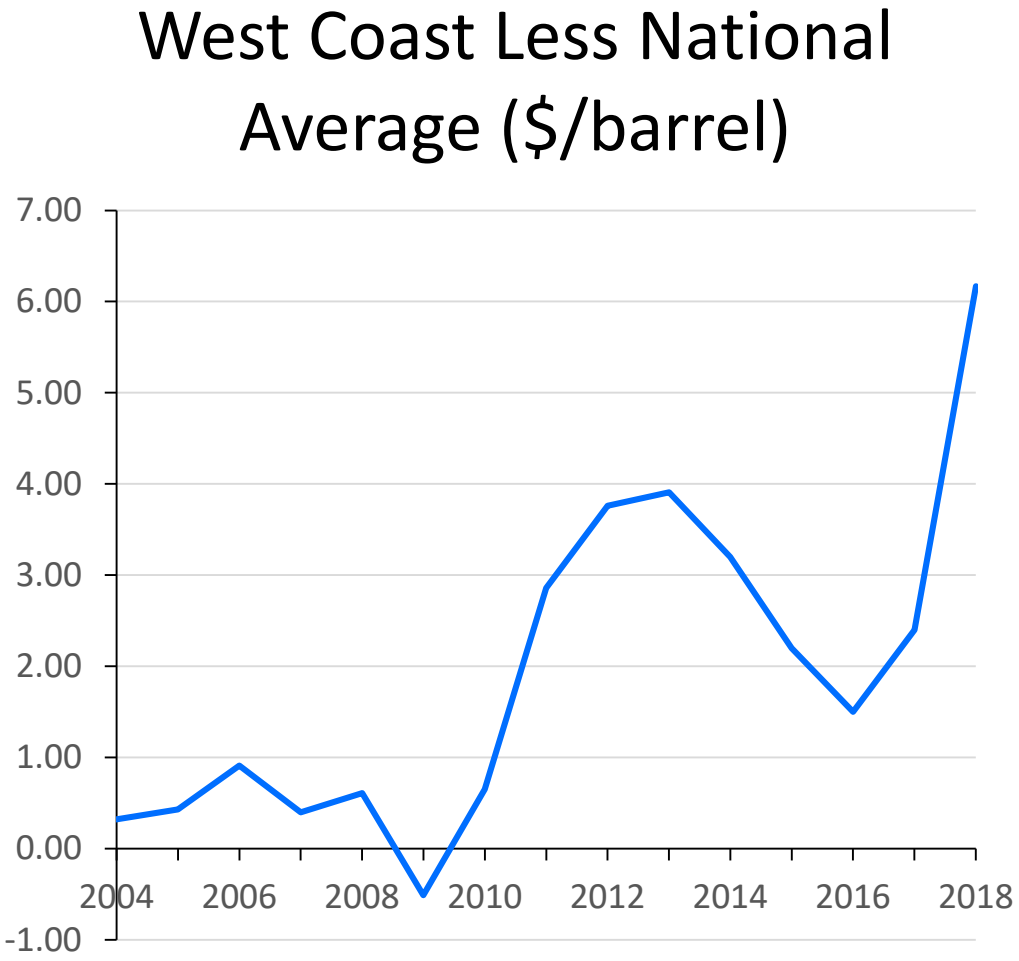
Price of Carbon and LCFS Credits



Source: U.S. Energy Information Administration

California Refiners Pay More for Crude Oil

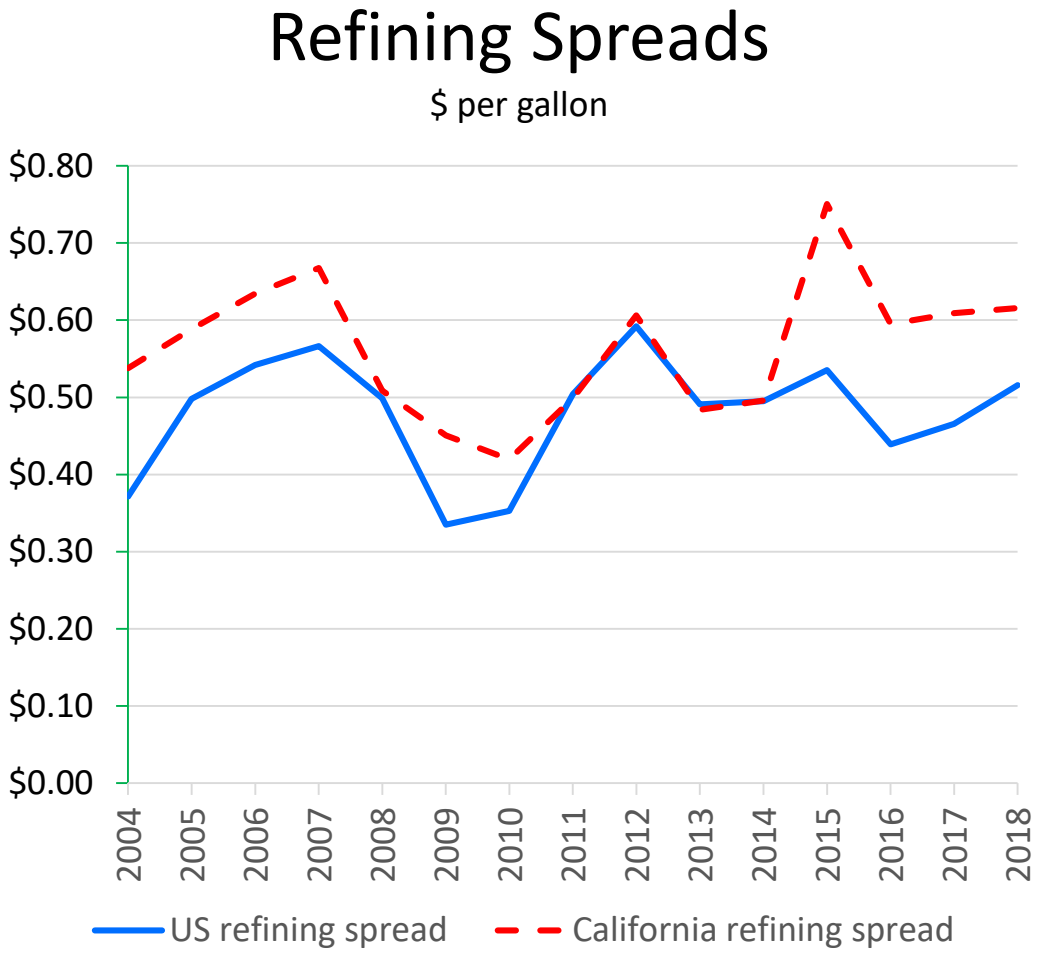
- West coast refiners pay more than the national average for crude oil
- This is at least in part due to the fact that shale oil is available to refineries located east of the Rockies



Source: U.S. Energy Information Administration

California Refining Costs Are High

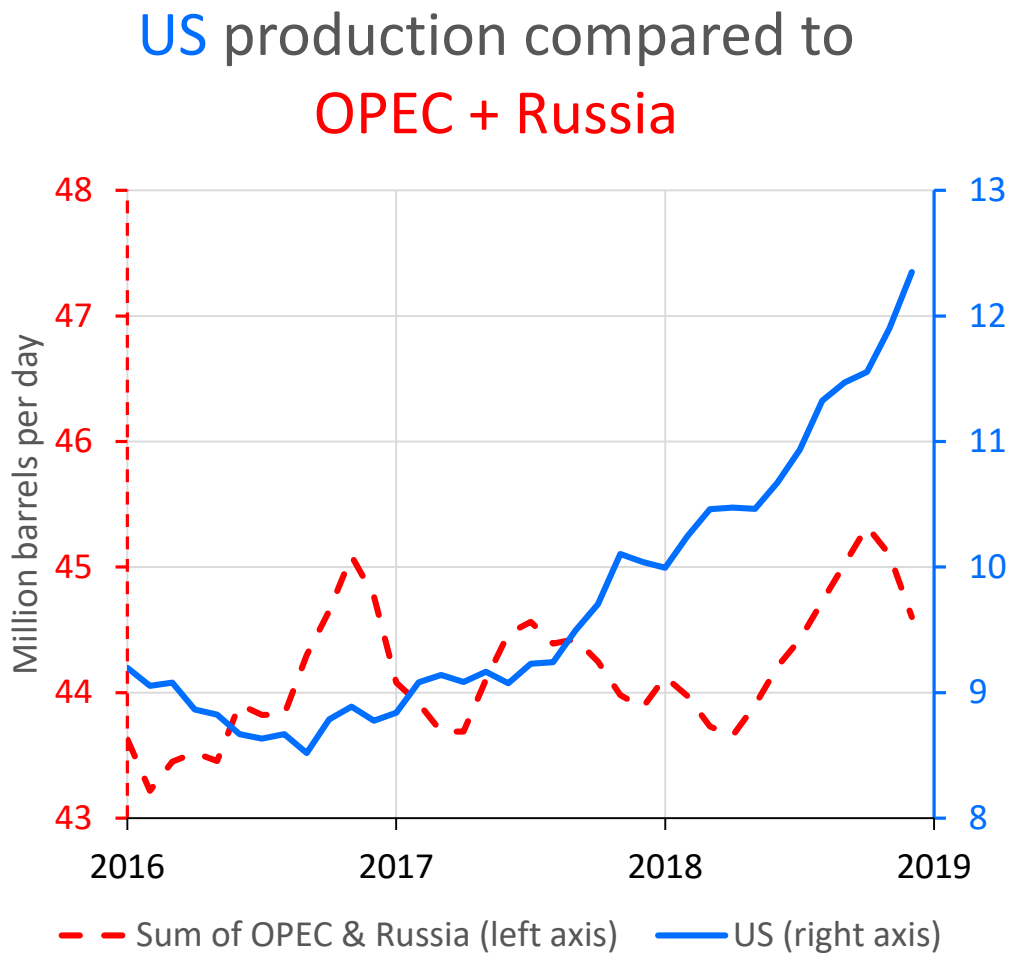
- The cost of producing gasoline that meets California specifications is high
- The graph assumes a typical California mix of refined products
- The spike in 2015 coincides with the outage at Exxon-Mobil's Torrance refinery



Source: U.S. Energy Information Administration

Crude Oil Production Trends

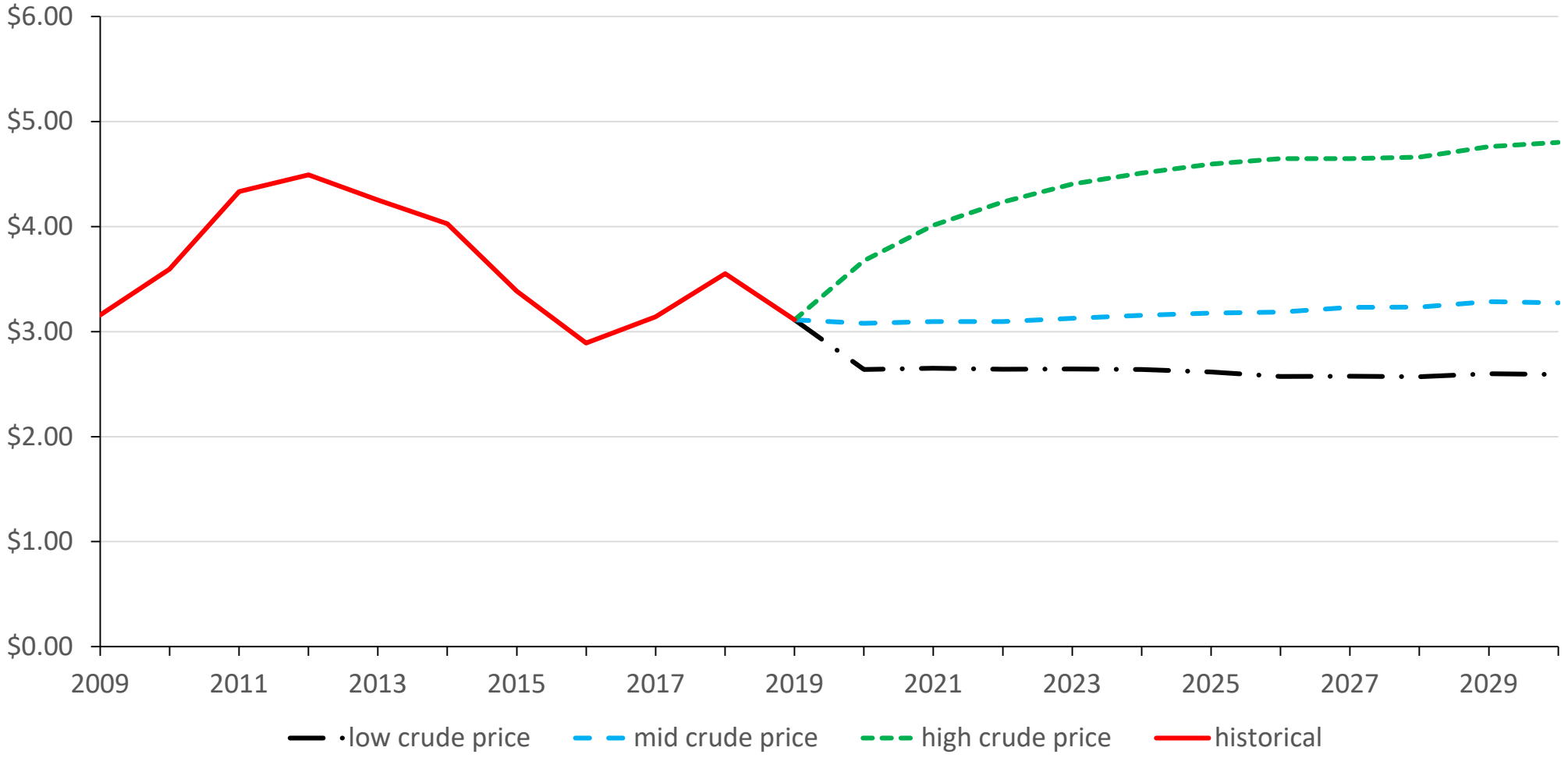
- US production has been growing faster than OPEC and Russia combined—during 2018, 2.3 million barrels per day compared to 0.7
- OPEC and non-OPEC countries agreed to cut production by 1.2 million barrels per day starting in January 2019.
- Alberta has also announced cuts of 325 thousand barrels per day; already announced reduction in cuts to 250 thousand.
- Iran and Venezuela will likely experience production declines



Source: U.S. Energy Information Administration

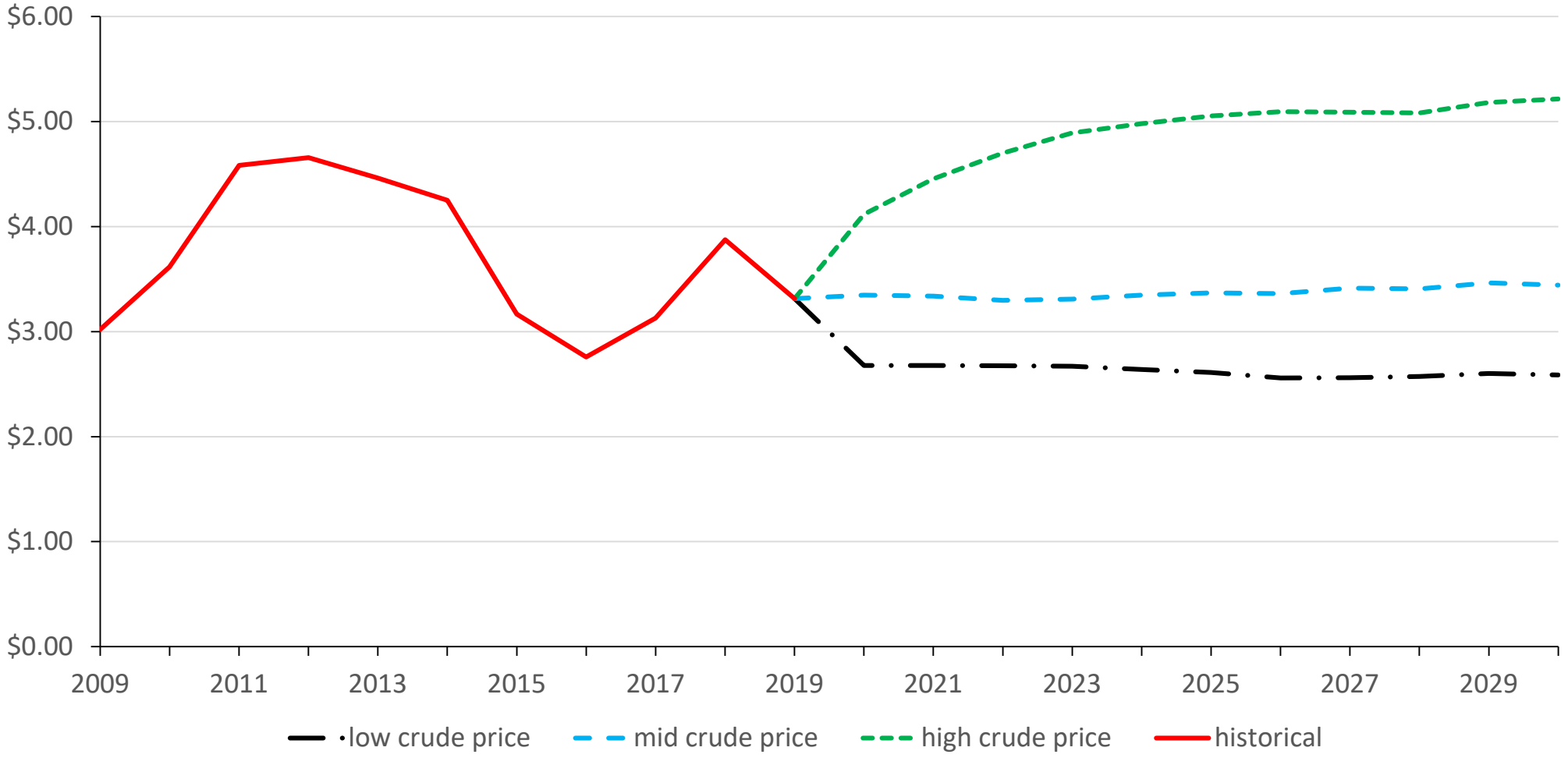
California Gasoline Preliminary Price Forecast

$2018



California Diesel Preliminary Price Forecast

$2018



California Propane Preliminary Price Forecast

$2018, gasoline gallon equivalents