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<th><strong>Docket Number:</strong></th>
<th>19-IEPR-03</th>
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<tr>
<td><strong>Project Title:</strong></td>
<td>Electricity and Natural Gas Demand Forecast</td>
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<tr>
<td><strong>TN #:</strong></td>
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<tr>
<td><strong>Document Title:</strong></td>
<td>Transportation Fuel Price Forecasts For the 2019 IEPR</td>
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<tr>
<td><strong>Description:</strong></td>
<td>Presentation by Ysbrand van der Werf of CEC</td>
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<td><strong>Filer:</strong></td>
<td>Raquel Kravitz</td>
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<td><strong>Organization:</strong></td>
<td>California Energy Commission</td>
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<td>Commission Staff</td>
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Transportation Fuel Price Forecasts For the 2019 IEPR

Inputs and Assumptions for Transportation Energy Demand Forecasts

Rosenfeld Hearing Room

March 4, 2015

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Energy Assessments Division
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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

U.S. Prices

California Prices

Source: U.S. Energy Information Administration
• 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

<table>
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<tr>
<th></th>
<th>2019</th>
<th>State Sales Tax</th>
<th>State Excise Tax (¢/gallon)</th>
<th>Underground Storage Tank Fee (¢/gallon)</th>
<th>Total tax at $3 per gallon (¢/gallon)</th>
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<tbody>
<tr>
<td>Gasoline</td>
<td></td>
<td>2.25%</td>
<td>41.7</td>
<td>2</td>
<td>50.45</td>
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<tr>
<td>Diesel</td>
<td></td>
<td>13%</td>
<td>36</td>
<td>2</td>
<td>77</td>
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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 Propane Preliminary Price Forecast

$2018, gasoline gallon equivalents

- Low crude price
- Mid crude price
- High crude price