Chart of the Week #2023-23
Calculating The Renewable Diesel Margin

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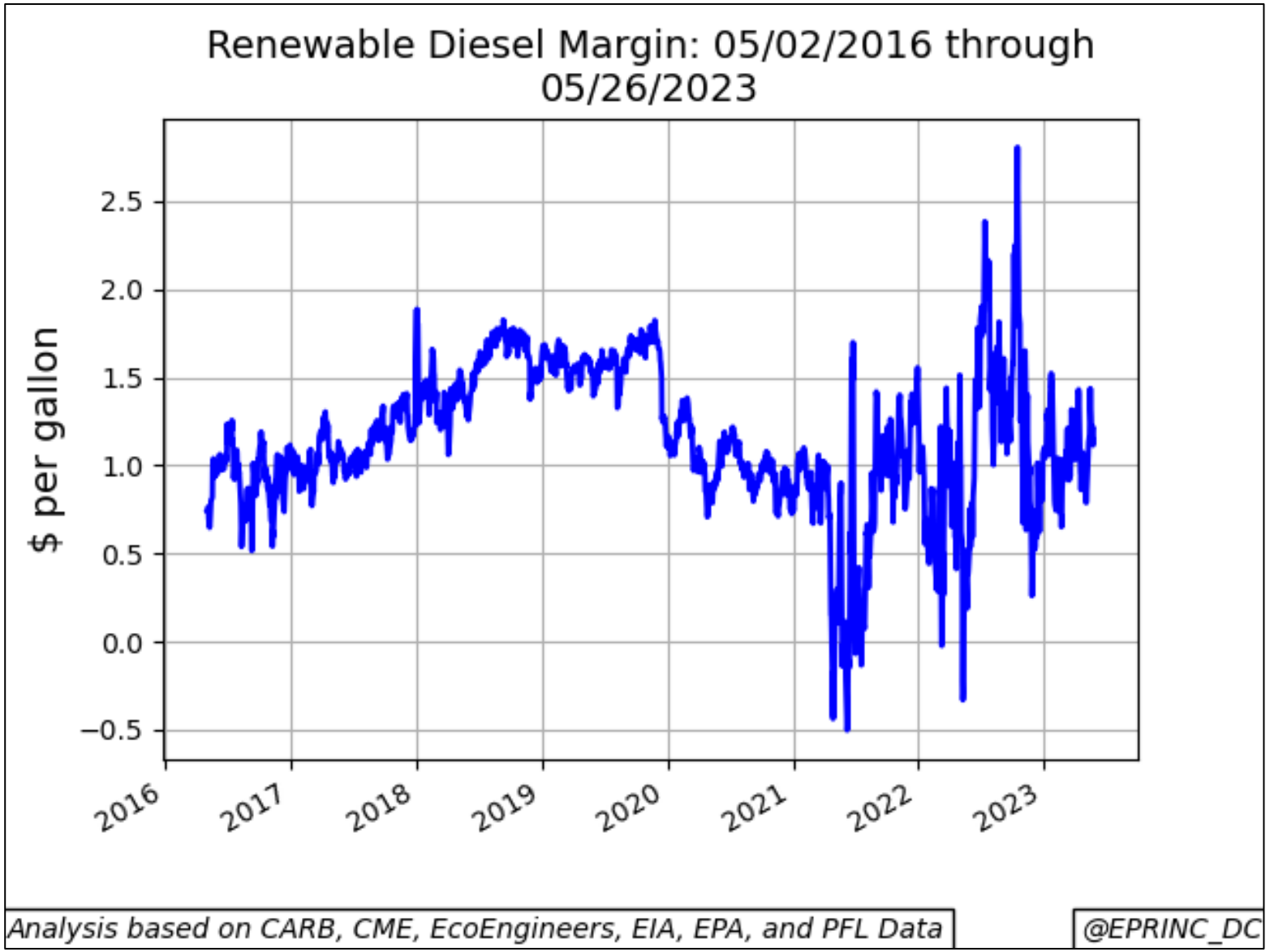
Calculating The Renewable Diesel Margin

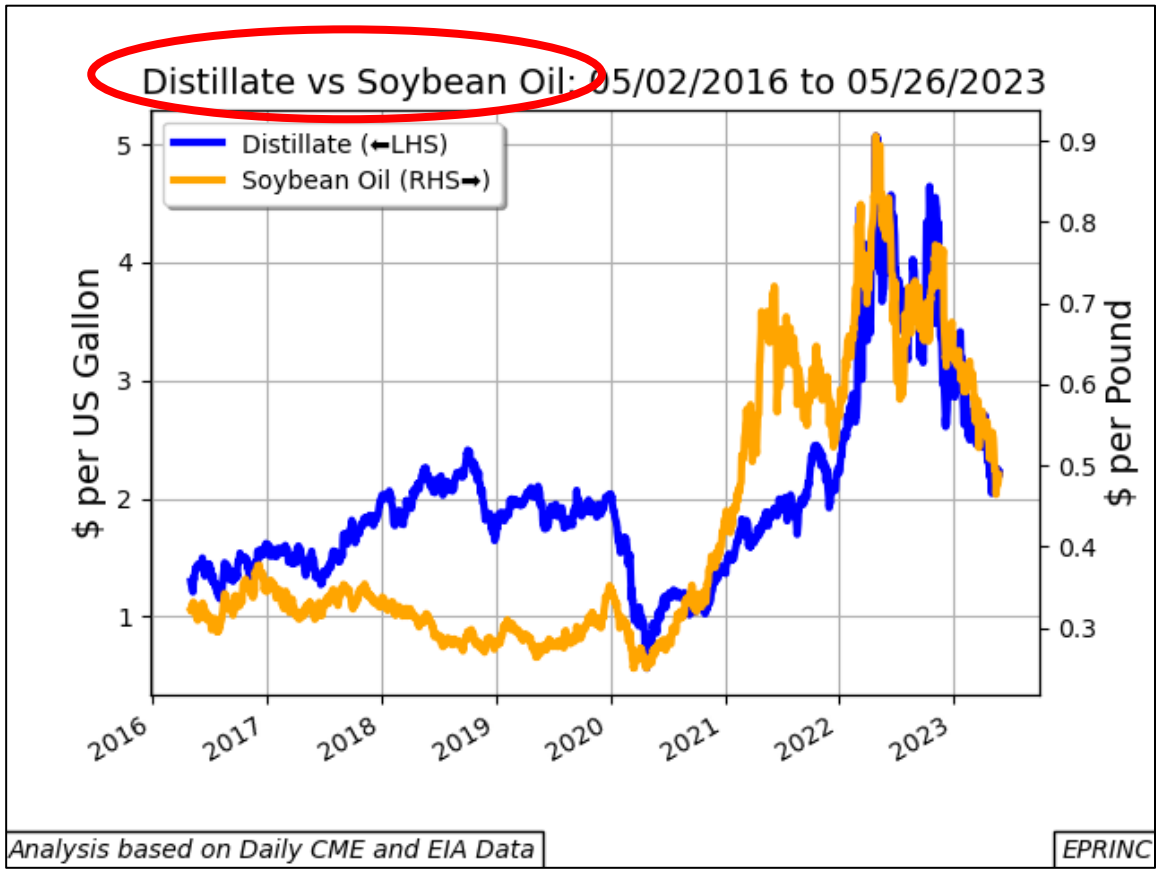


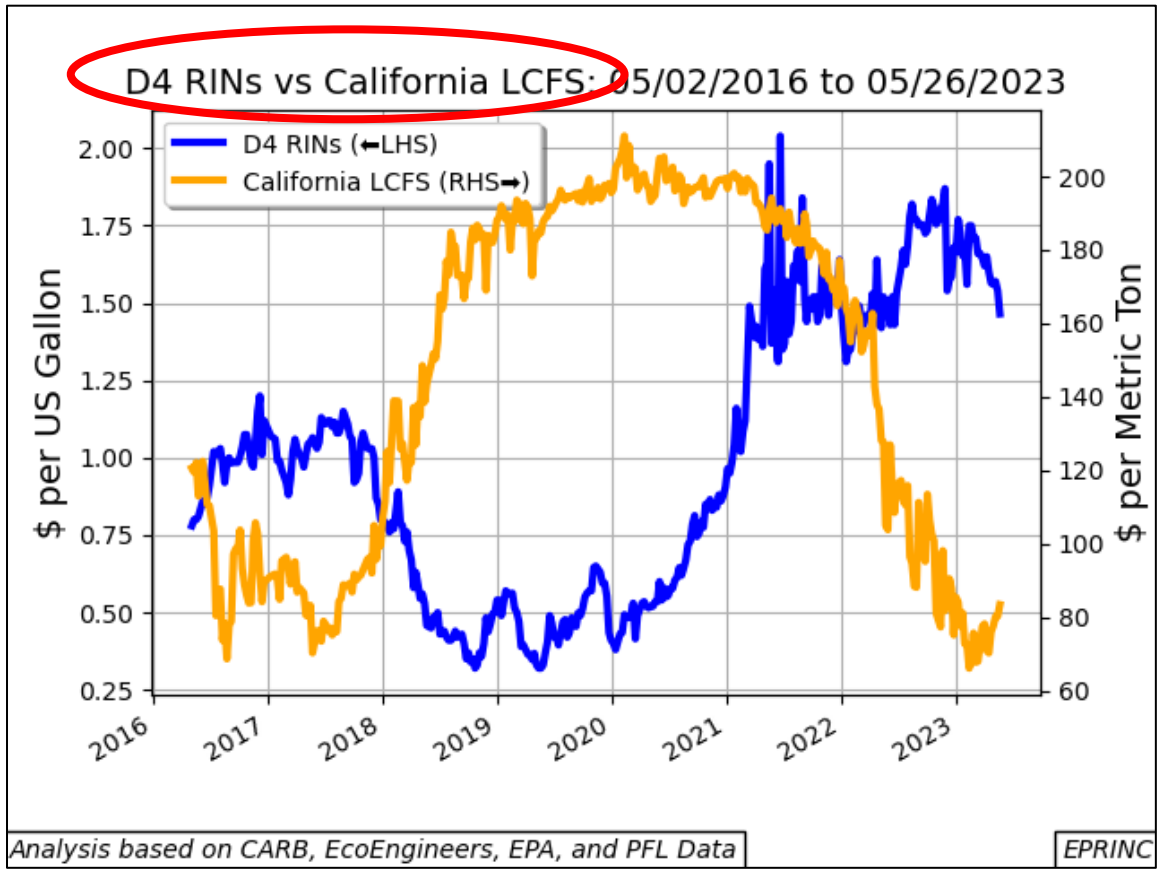
From 2016 through 2020, the renewable diesel margin exhibited little volatility; feedstock and distillate prices were steady and the LCFS prices rose to almost $200 per metric ton, offsetting declines in D4 Biodiesel RINs.

Beginning in 2021, the renewable diesel margin, while mostly positive became considerably volatile: distillate and feedstock prices rose considerably while LCFS prices dropped while D4 RINs rose to historically high levels.

Calculating The Renewable Diesel Margin Inputs: Commodity and Credit Prices

Energy Policy Research Foundation





Calculating The Renewable Diesel Margin

- Renewable diesel is a fuel made from feedstocks such as soybean and corn oils as well as waste such as animal fats and cooking grease. It is produced in a petroleum refinery, is chemically equivalent to its petroleum counterpart, and has almost the same amount of energy as its petroleum counterpart. Consequently, it is known as a "drop-in" fuel since it requires no changes in handling or distribution infrastructure. In addition, it can be used in conventional diesel engines at blend rates up to 100%.
- Biodiesel, renewable diesel's counterpart, is produced from similar feedstocks, but through a process known as esterification. Biodiesel blending with petroleum diesel can only be done up to a rate of 20%.
- Demand for renewable diesel is driven by renewable fuel mandates. At the state level, California, through its LCFS (Low Carbon Fuel Standard) program requiring decreasing CI (carbon intensity) of transportation fuels is one key driver. At the national level and with the objective of lowering petroleum-based fuels, the RFS (Renewable Fuel Standard) mandates the increased use of biofuels annually.
- Given aggressive and increasing biofuel blending mandates under the RFS, obligated parties look for strategies to mitigate their RIN (RFS renewable identification numbers) and LCFS credit exposure. Renewable diesel production is one such way.
- In the same way that crack and fractionation spreads are used to estimate the implied margins of motor fuel (gasoline and distillate) and gas liquids (ethane, propane, butane, and plant condensate) production, respectively, so too, the renewable diesel margin is used to gauge the implied returns of renewable diesel production.
- The formula for the renewable diesel margin is:
- NYMEX ULSD + (1.7 * Biodiesel RIN) + (0.00707 * LCFS Credit) – (8.5 * CBOT Soybean Oil) where:
- • New York Ultra Low Sulfur Diesel (ULSD) price, $ per gallon
- • D4 Biodiesel RINs $ per RIN (D4 RINs are converted at a rate of 1.7 for D6 ethanol RINs)
- • Low Carbon Fuel Standard (LCFS) credit, $ per metric ton (with a carbon intensity of 54, renewable diesel earns 0.00707 of an LCFS credit per gallon)

Calculating The Renewable Diesel Margin

- **The formula for the renewable diesel margin is:**

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  - **New York Ultra Low Sulfur Diesel (ULSD) price, $ per gallon**
  - **D4 Biodiesel RINs $ per RIN (D4 RINs are converted at a rate of 1.7 for D6 ethanol RINs)**
  - **Low Carbon Fuel Standard (LCFS) credit, $ per metric ton (with a carbon intensity of 54, renewable diesel earns 0.00707 of an LCFS credit per gallon)**
  - **Chicago soybean oil price, $ per pound (8.5 pounds of soybean oil are required to produce one gallon of renewable diesel)**

- **From 2016 through 2020, the renewable diesel margin exhibited little volatility; feedstock and distillate prices were steady and the LCFS prices rose to almost $200 per metric ton, offsetting declines in D4 Biodiesel RINs.**
- **Beginning in 2021, the renewable diesel margin, while mostly positive became considerably volatile: distillate and feedstock prices rose considerably while LCFS prices dropped while D4 RINs rose to historically high levels.**
- **This slide deck is available at: https://eprinc.org/chart-of-the-week/**
- **For more information on this chart, please contact Max Pyziur (maxp@eprinc.org).**