



Oil and Diesel Update:

What to expect in 2024

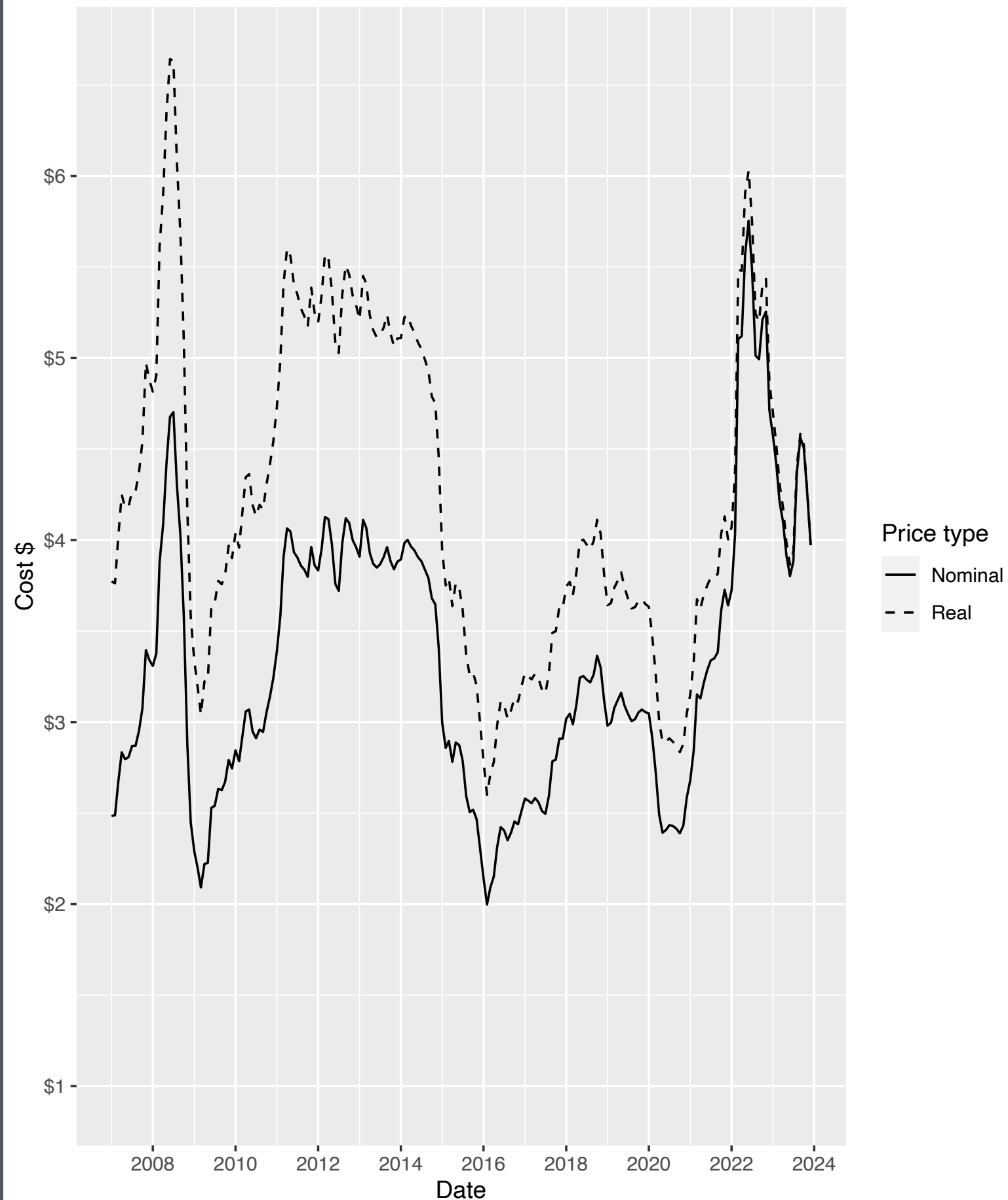
Gregg Ibendahl - K-State

2024-02-21

A close-up photograph of a green diesel fuel nozzle inserted into a vehicle's fuel tank. The nozzle is bright green and has a black handle. It is connected to a black hose. The background is a metallic surface, likely the fuel tank door. The text "Diesel Fuel" is overlaid in white, centered on the nozzle.

Diesel Fuel

Highway Diesel Price

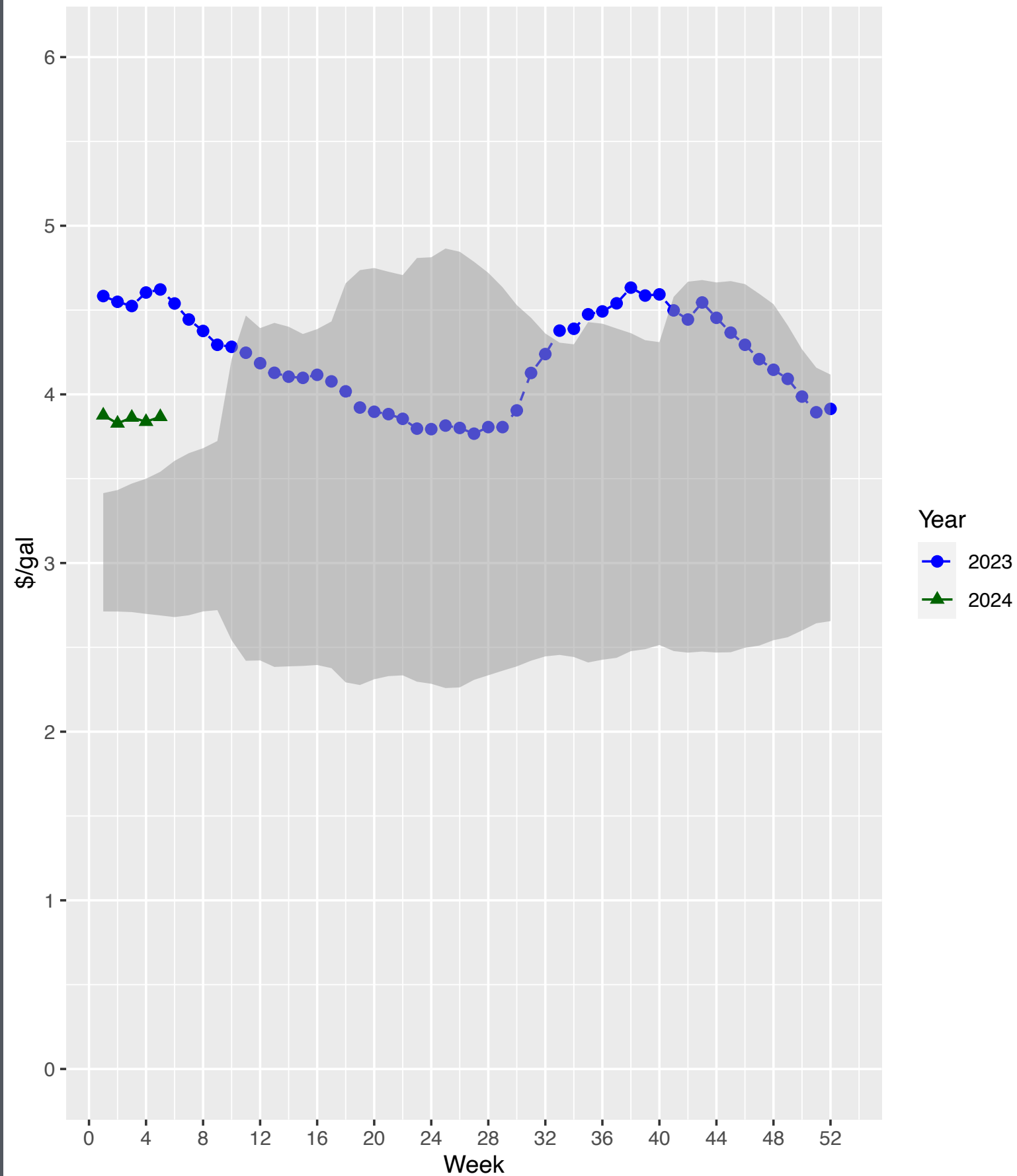


Diesel prices are lower than than last year

- Prices were volatile during 2023
 - Declining by \$0.75, and then rising and falling by the same amount
 - Will 2024 exhibit the same pattern?
- The diesel-gas premium was also volatile
- World supply is a concern
- Domestic refinery capacity is still constrained
- Prices are still well below their 2/22 peak

U.S. Highway Diesel Prices by Week for 2023 and 2024

Plus/minus one Std Dev of previous 5 years in gray

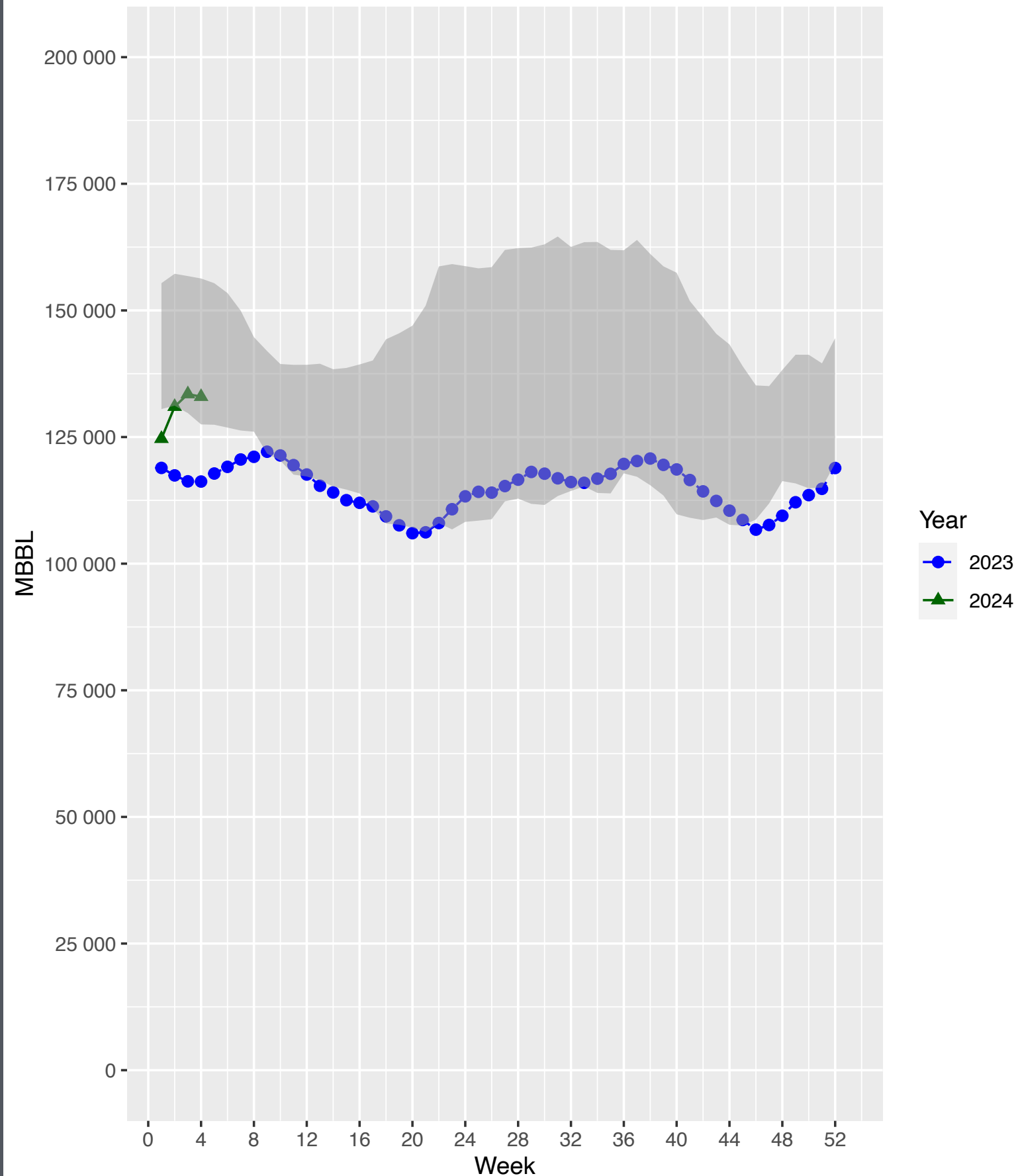


Diesel price comparison to the last 5 years

- 2023 prices were at the top end of the 5-year price range
- Prices enter 2024 \$0.50 below last year

U.S. Diesel Stocks by Week for 2023 and 2024

Plus/minus one Std Dev of previous 5 years in gray

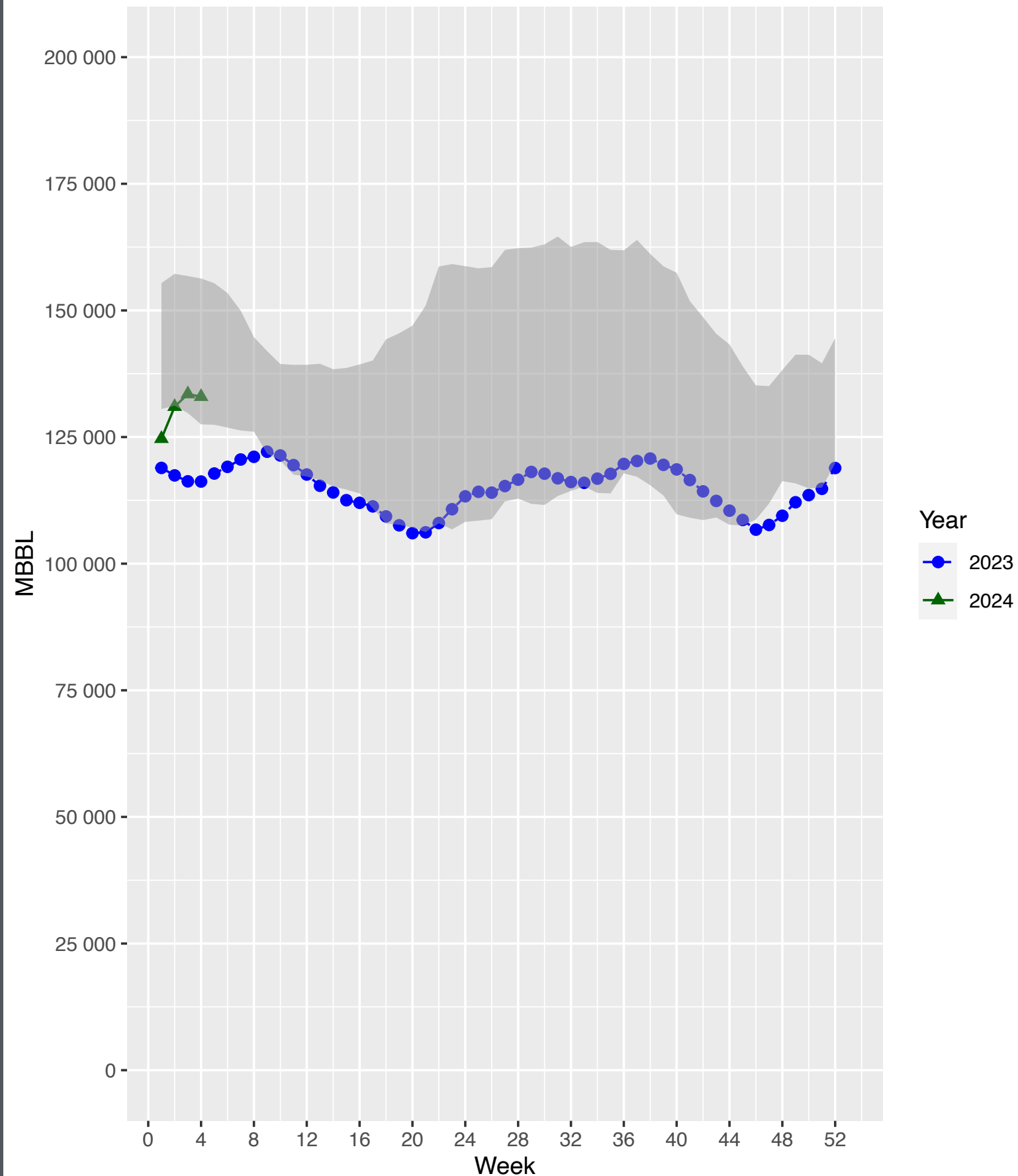


Diesel stocks compared to the last 5 years

- Diesel stocks are very low
- Due to refinery constraints, this situation is likely to persist
- Stocks are a little better heading into 2024

U.S. Gasoline Stocks by Week for 2023 and 2024

Plus/minus one Std Dev of previous 5 years in gray



Gasoline stocks compared to the last 5 years

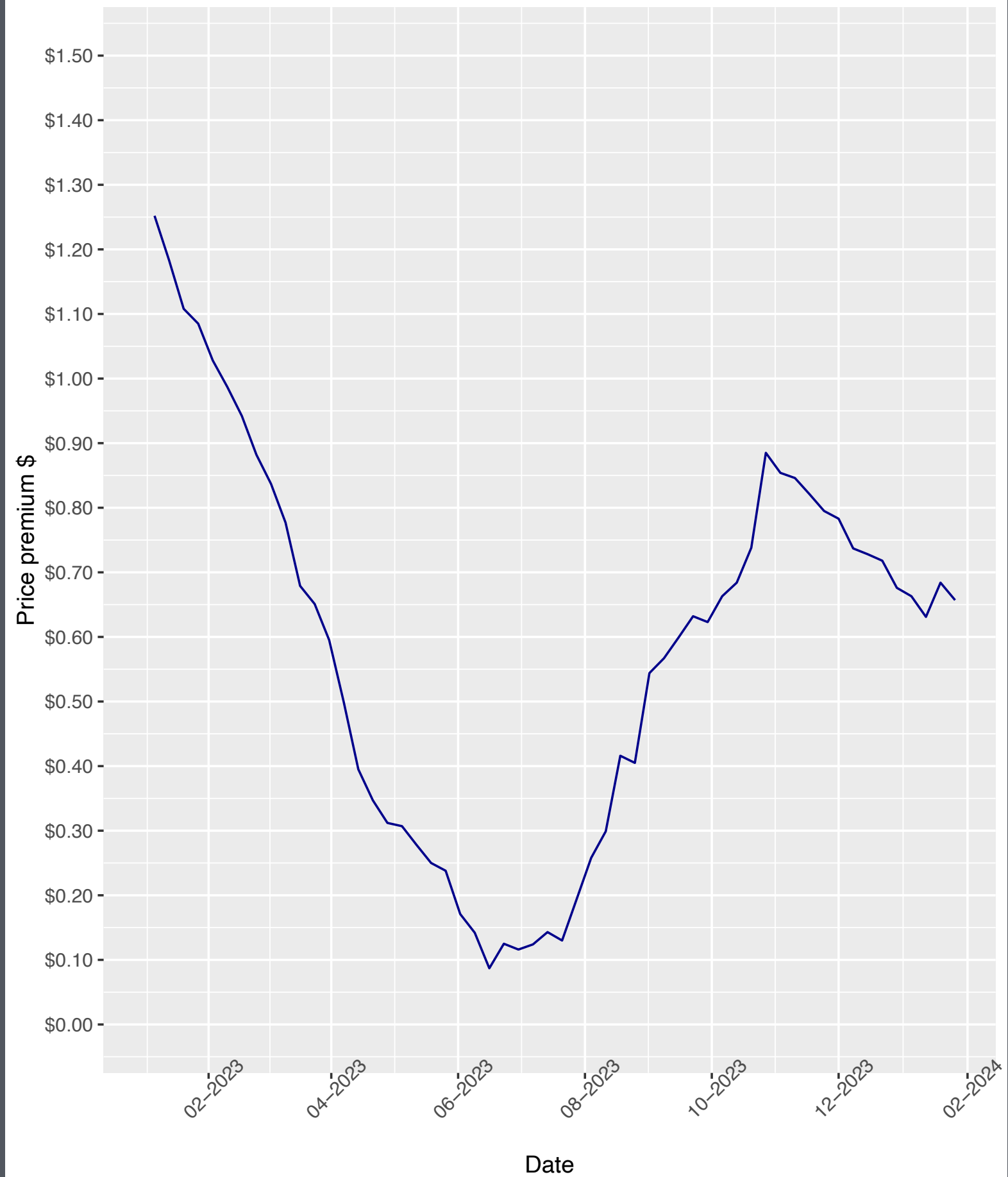
- Gasoline stocks are also very low
- Low gasoline stocks may be a contributing factor to the diesel-gas premium
 - Pressure from consumers to keep gas low
 - (i.e., millions of consumers vs thousands of construction-truckers)



Gasoline and diesel prices for the last year

- The price differential changed dramatically during the year
- Will this happen again in 2024?

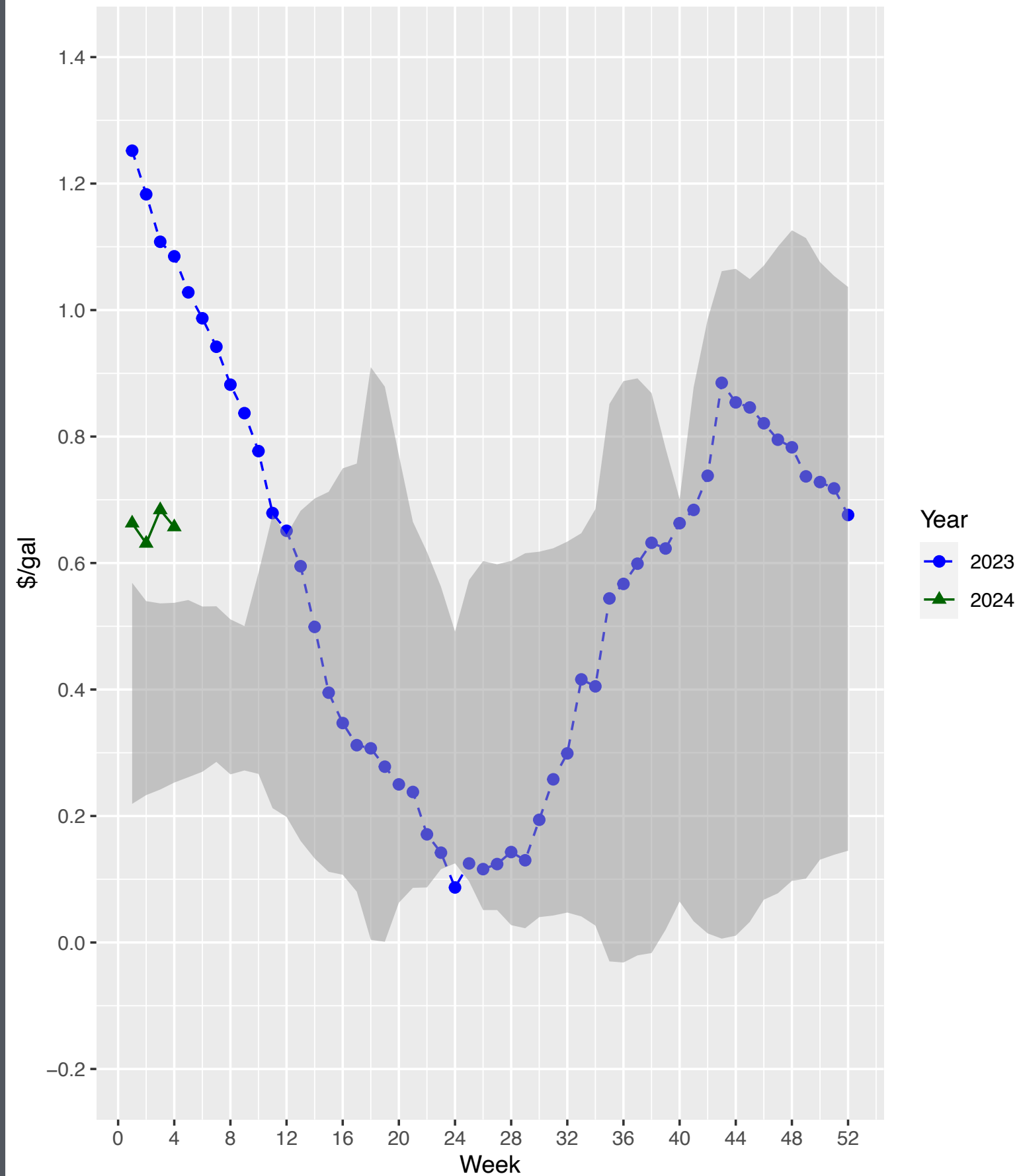
Diesel to Gas Premium



Diesel to gas price
premium

U.S. Diesel Price Premium by Week for 2023 and 2024

Plus/minus one Std Dev of previous 5 years in gray



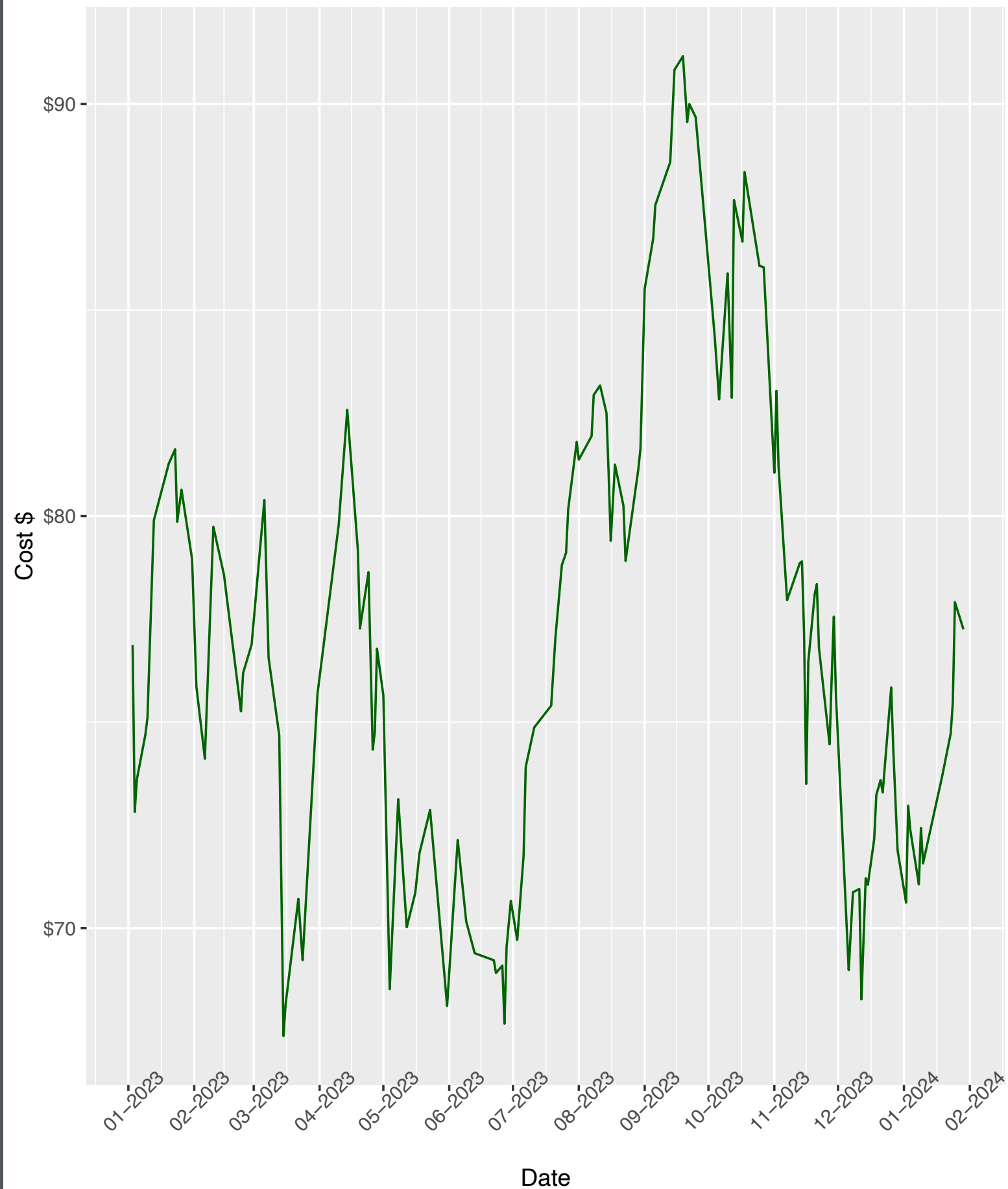
Diesel to gas premium compared to the last 5 years

- Entering 2024 above the 5 year range

A photograph of an oil pumpjack (jackal) in a desert environment. The pumpjack is painted green and white, with a long walking beam and a counterweight. It is mounted on a concrete foundation. In the foreground, there are some pipes and valves. The background shows a flat, arid landscape with other pumpjacks visible in the distance under a dramatic, cloudy sky. The word "Oil" is overlaid in white text on the right side of the image.

Oil

OK WTI Daily Spot Prices

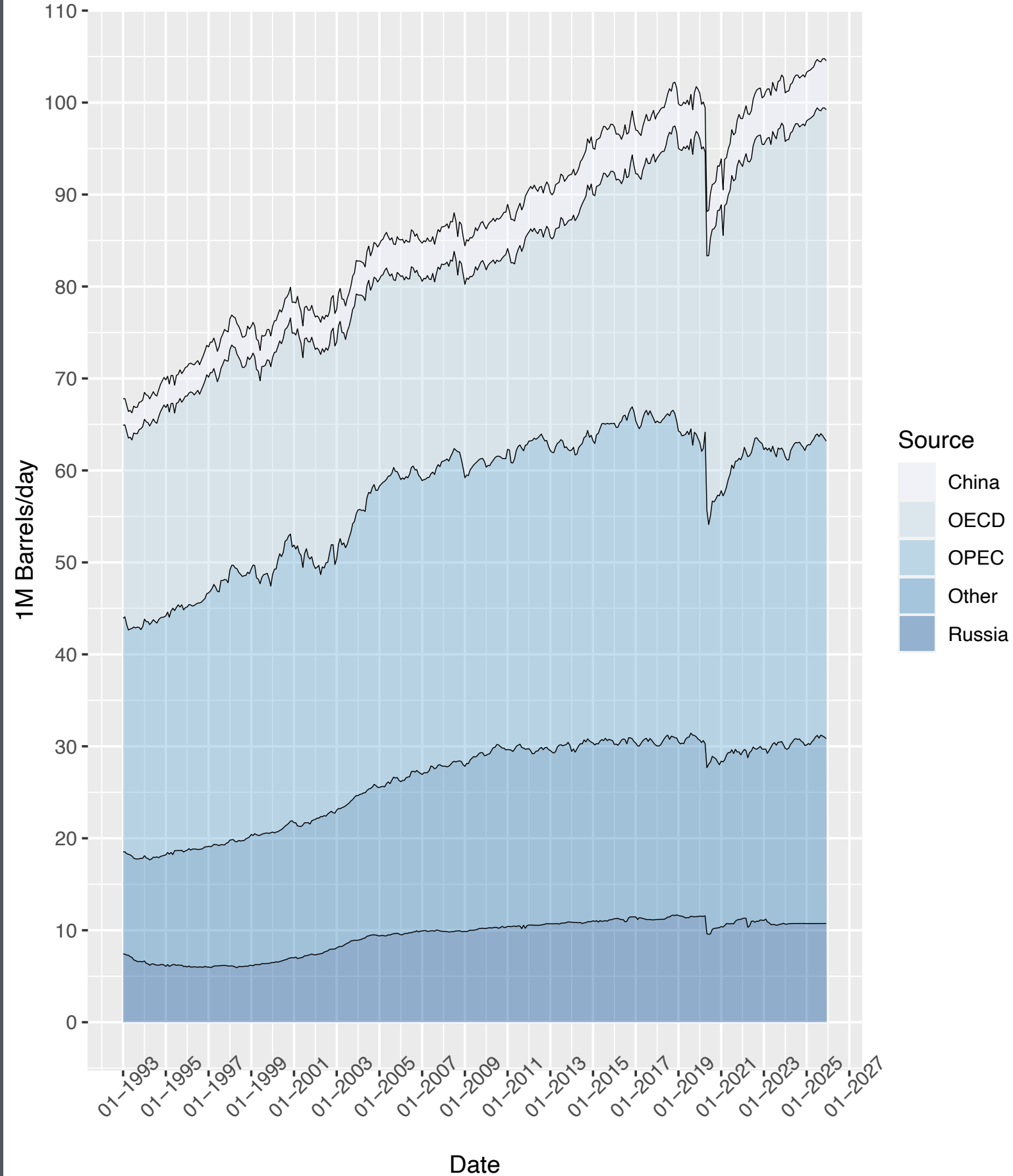


Oil prices for the past year

- Oil reached the \$130 level just after the start of the Russia/Ukraine war
- Prices have come down and have mostly been in the \$70 to \$80 range
- Is this price too low?
 - Price isn't all that different than before the war
 - Have traders appropriately priced the war risk?

Crude Oil and Liquid Fuels Supply by Area

includes 2 year EIA forecast

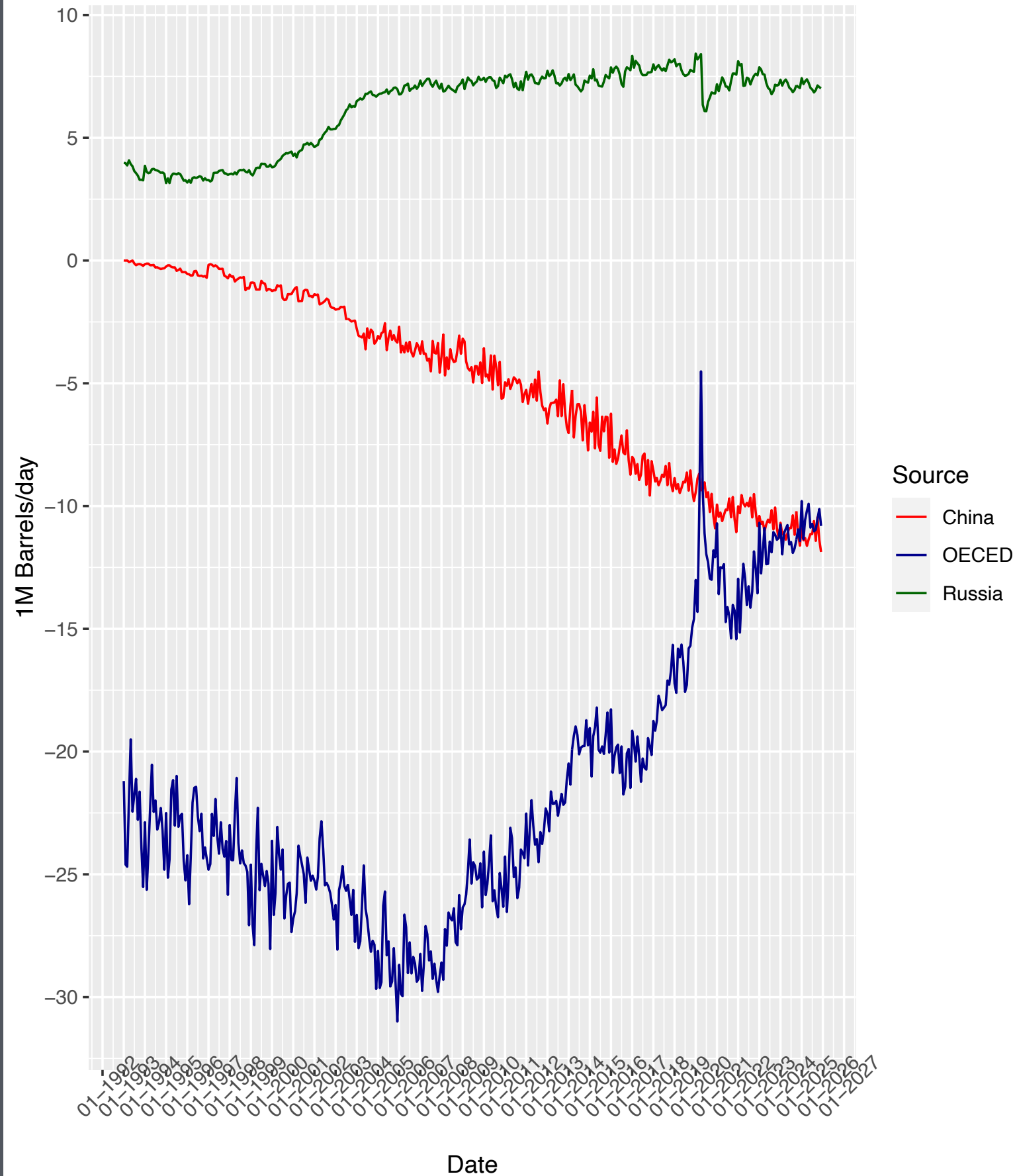


Total oil and other liquid fuel supplies by area

- The OECD countries (Organization for Economic Cooperation and Development -including the US) produce a lot of oil but also consume a lot
- OPEC and Russia are the biggest exporters
- China is relatively oil poor but consumes a lot

Crude Oil and Liquid Fuel Net Gain

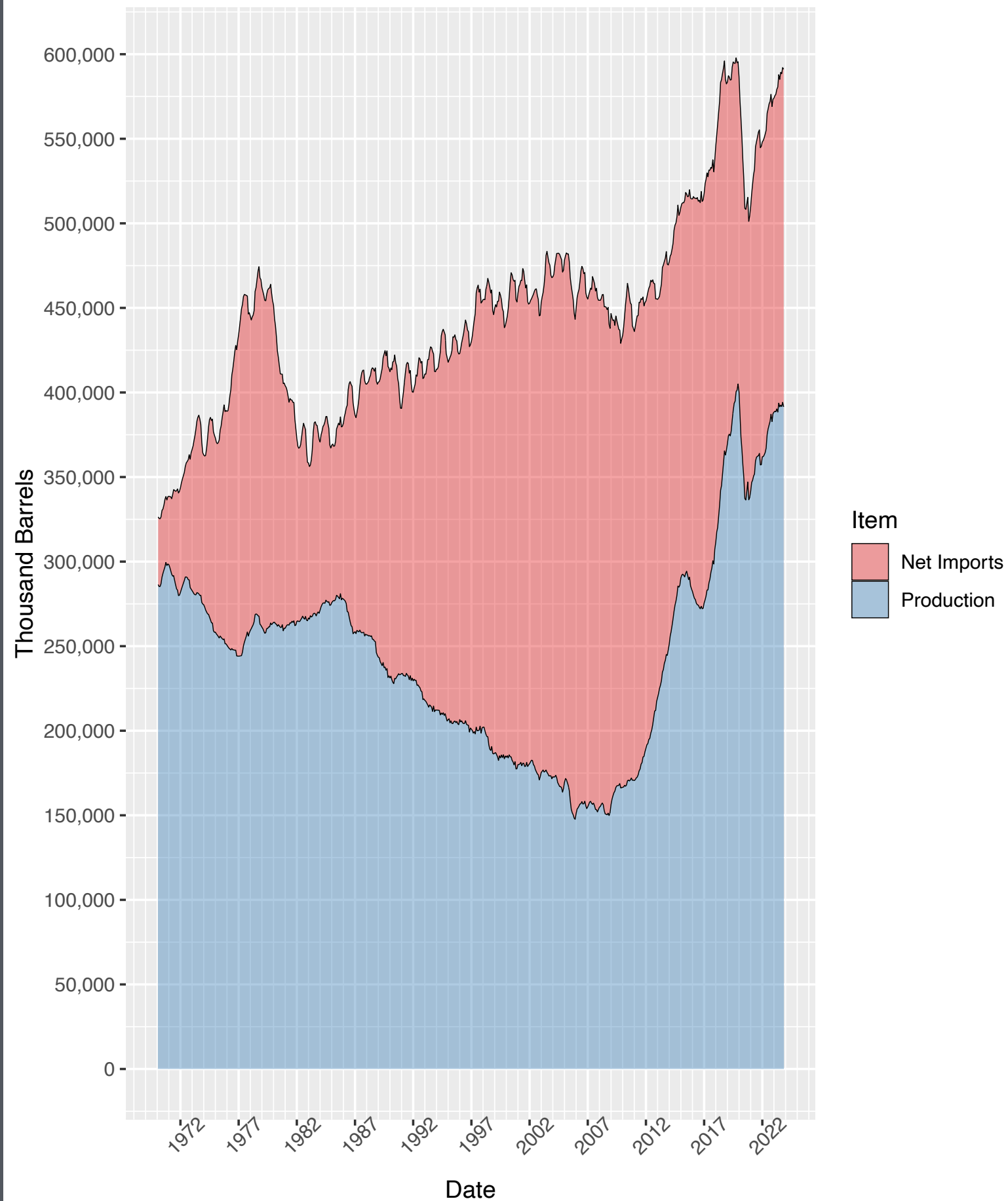
includes 2 year EIA forecast



Net liquid fuel gain

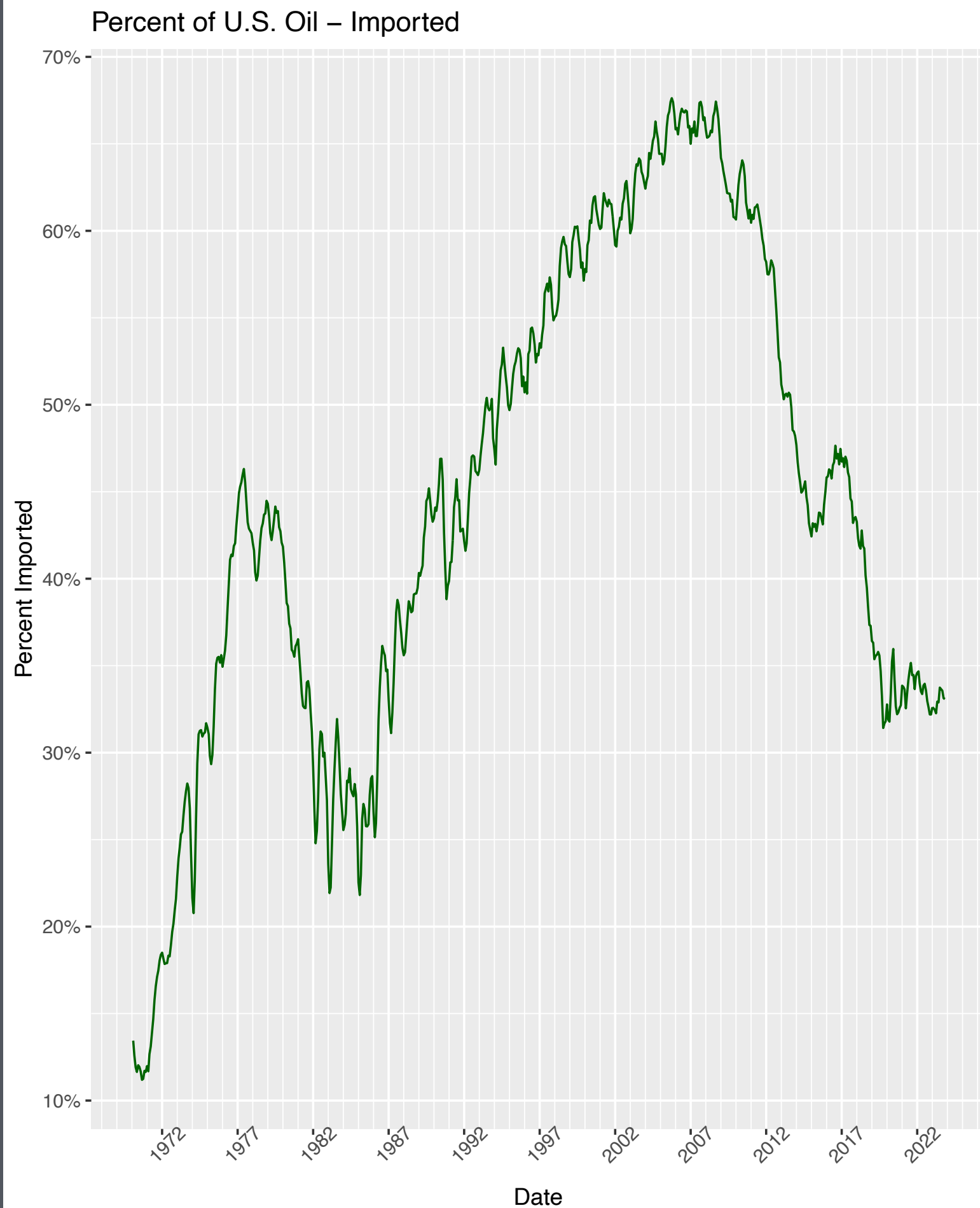
- The OECD countries require a lot of oil
 - The US is liquid fuel neutral despite being a net importer of oil
- China and Russia
 - China requires 10M barrels a day
 - Russia has a 7.5M barrel a day surplus
 - They share a 2,600 mile border - 6th longest international border

U.S. Oil Use by Production and Net Imports



U.S. oil production, use, and net imports

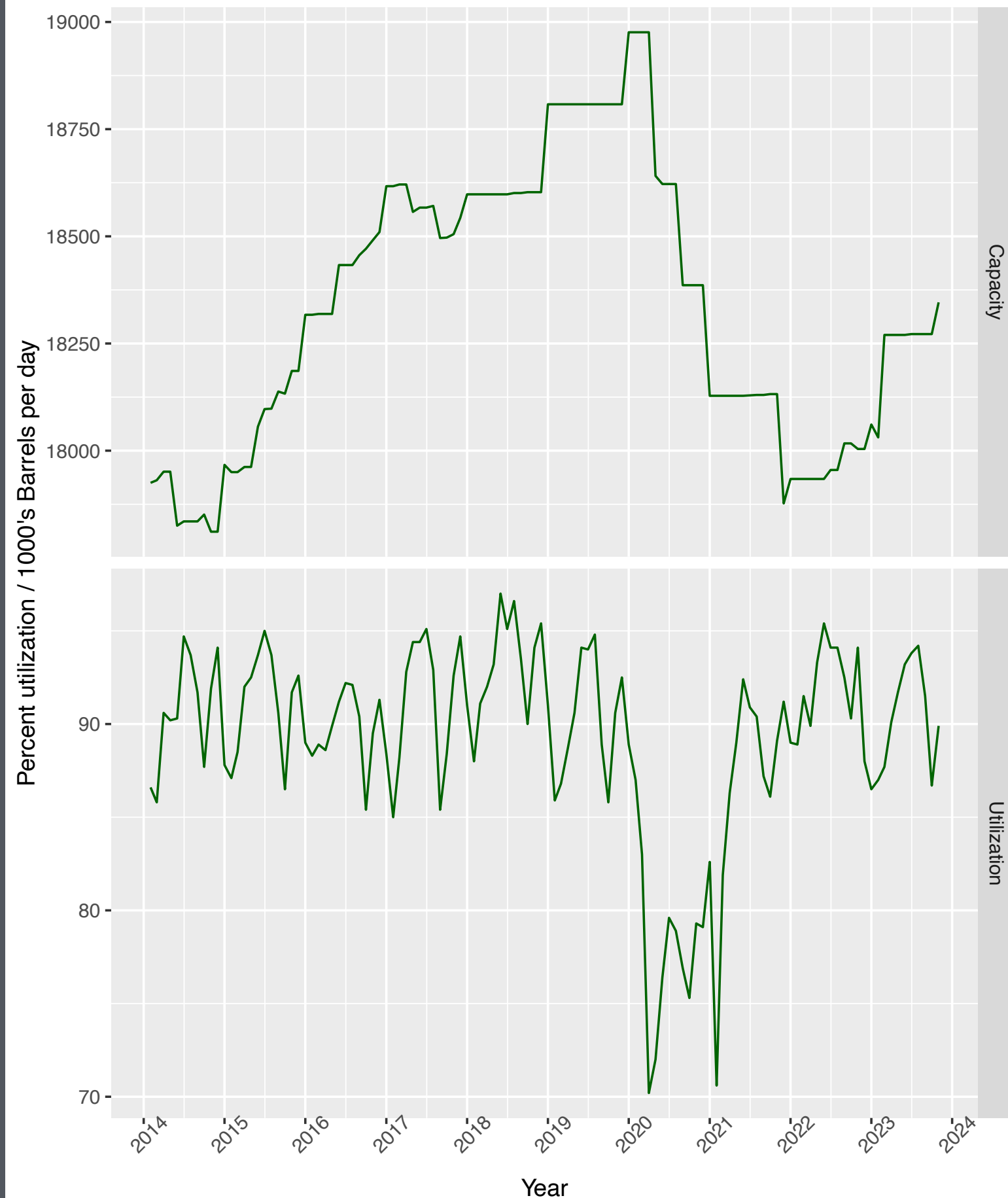
- The very top of the graph is the U.S. oil use
- U.S. both imports and exports oil
 - We import heavier weight oils
 - We export lighter weight oils



Percent of oil imported

- Fracking has helped get this percentage lower
- Refining capacity in the US is likely to prevent this from going much lower
- A move to more EVs could improve this percentage

Refinery Capacity and Utilization



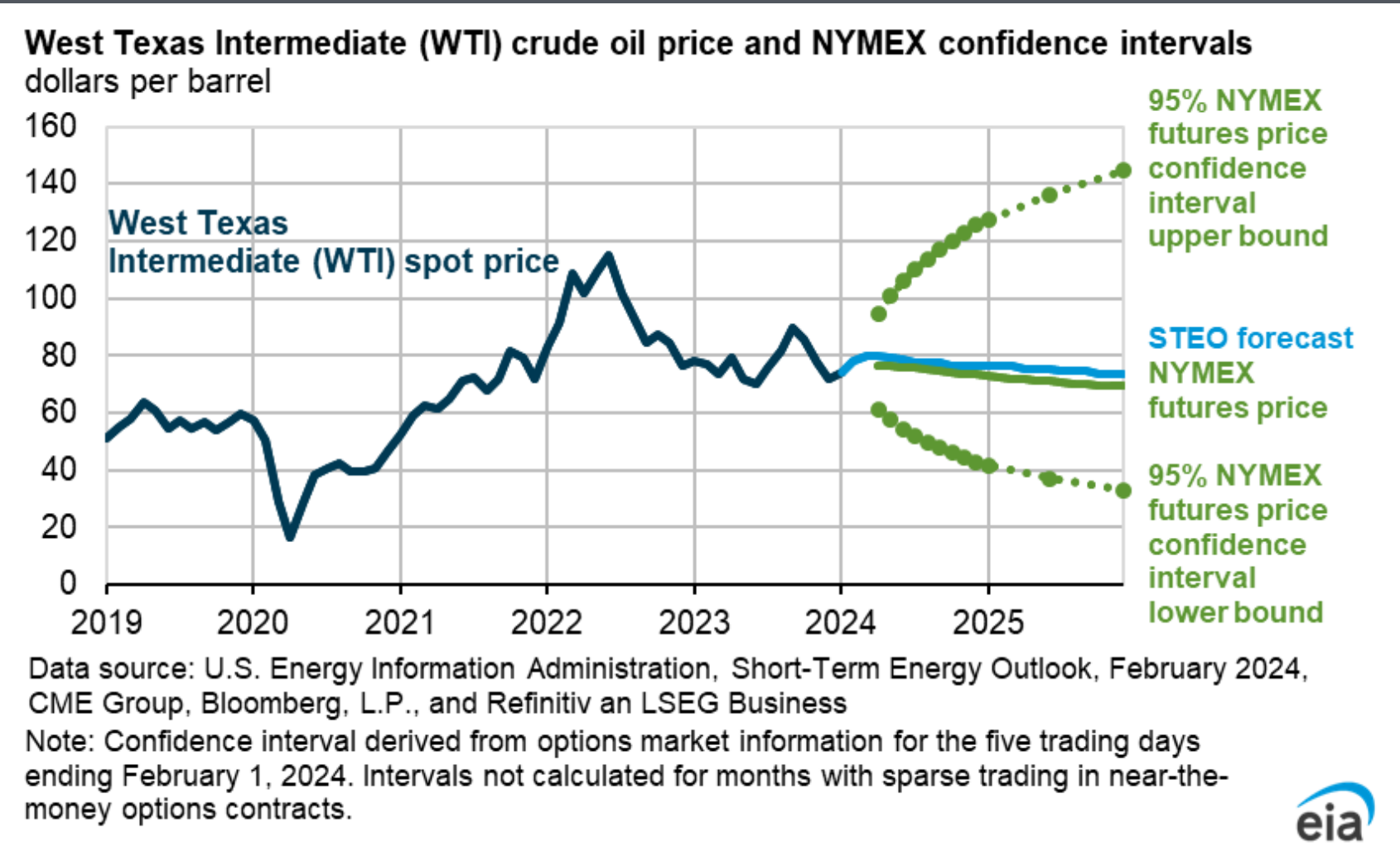
Refinery capacity and utilization

- Capacity is below pre-Covid
- Nearly impossible to build a new refinery in the U.S.
- Utilization remains very high despite the age of our refineries

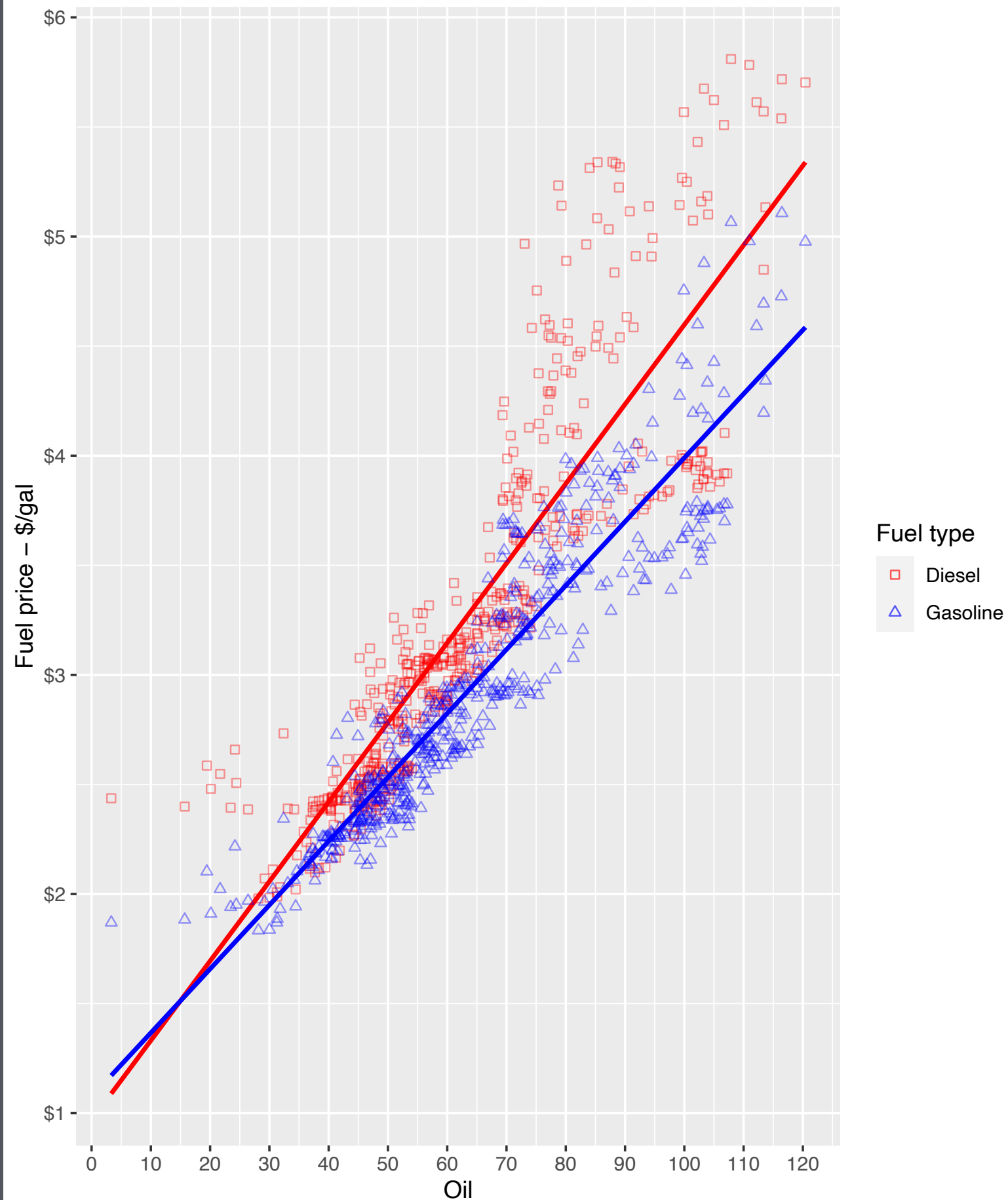
Predictions

EIA predictions of oil prices

- EIA is predicting prices in the \$70 range
 - Futures market says the same thing
- There is a wide confidence interval on their estimate though
- Is the Russia/Ukraine war adequately priced into this estimate?



Regression of Fuel vs Oil

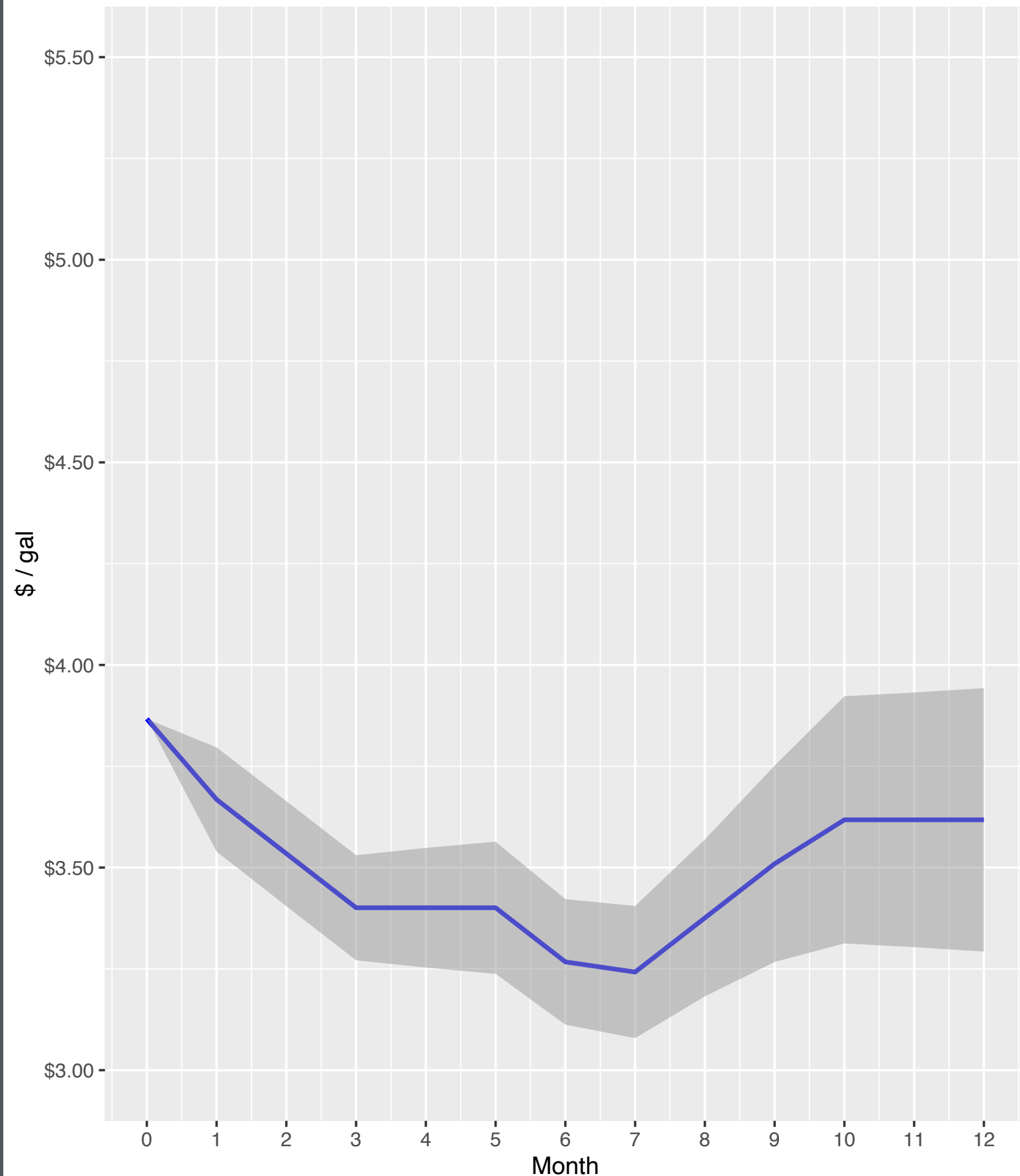


Where fuel prices should be

- \$80 dollar oil
 - \$3.40 gas
 - \$3.85 diesel
- Are the regression curves now different?
 - without more refinery capacity - Yes
 - the diesel line has shifted more vertical
 - notice the red points above the red line

Predicted U.S. Highway Diesel Price for Next 12 Months

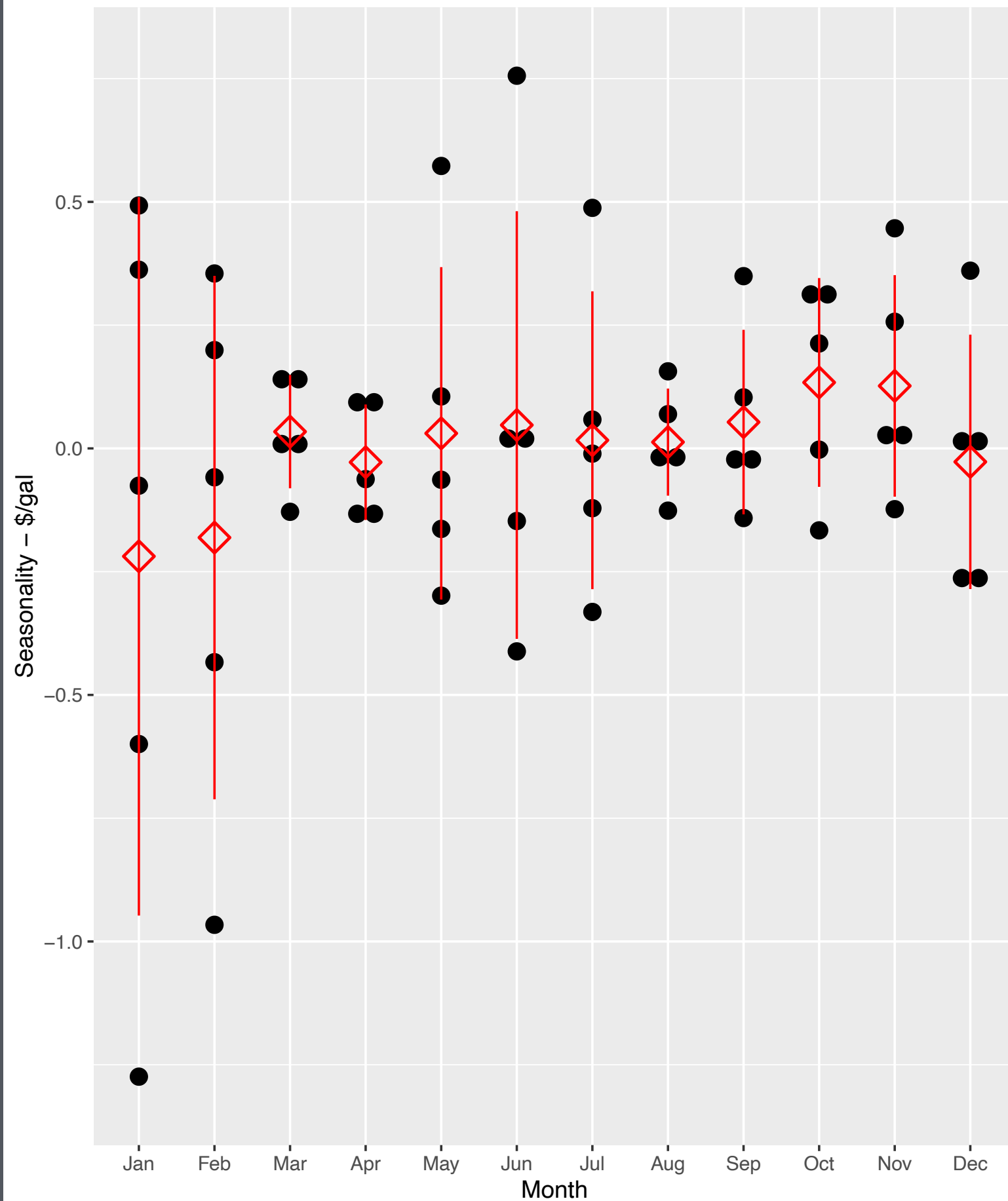
confidence interval in gray



My prediction for diesel prices for the next 12 months

- I'm using what happened last year with the diesel premium
 - This means prices should decline for the next 6 months and then rise
- As long as oil stays in the \$70 range, diesel prices should remain steady as well

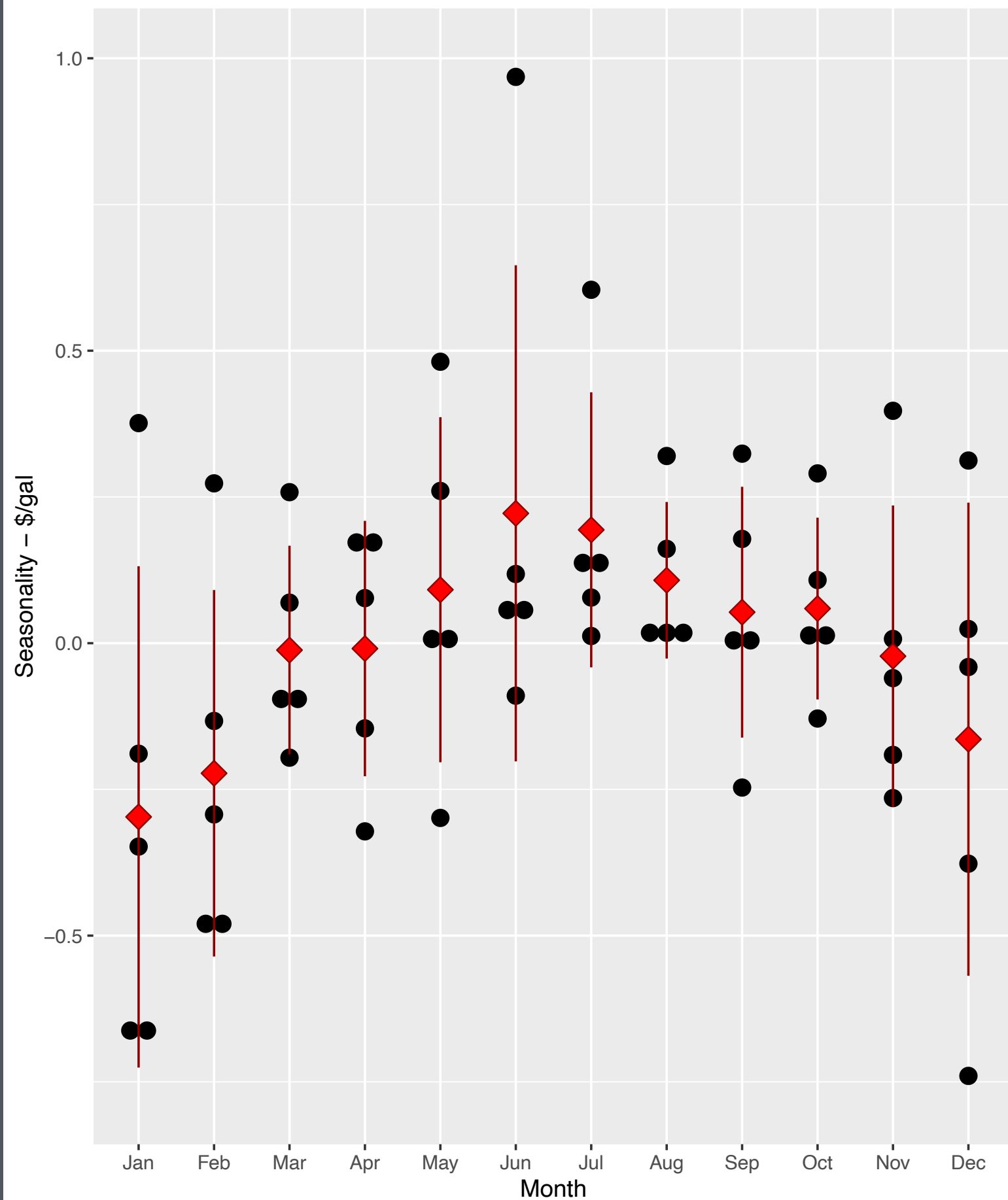
Diesel Seasonality



Diesel seasonality

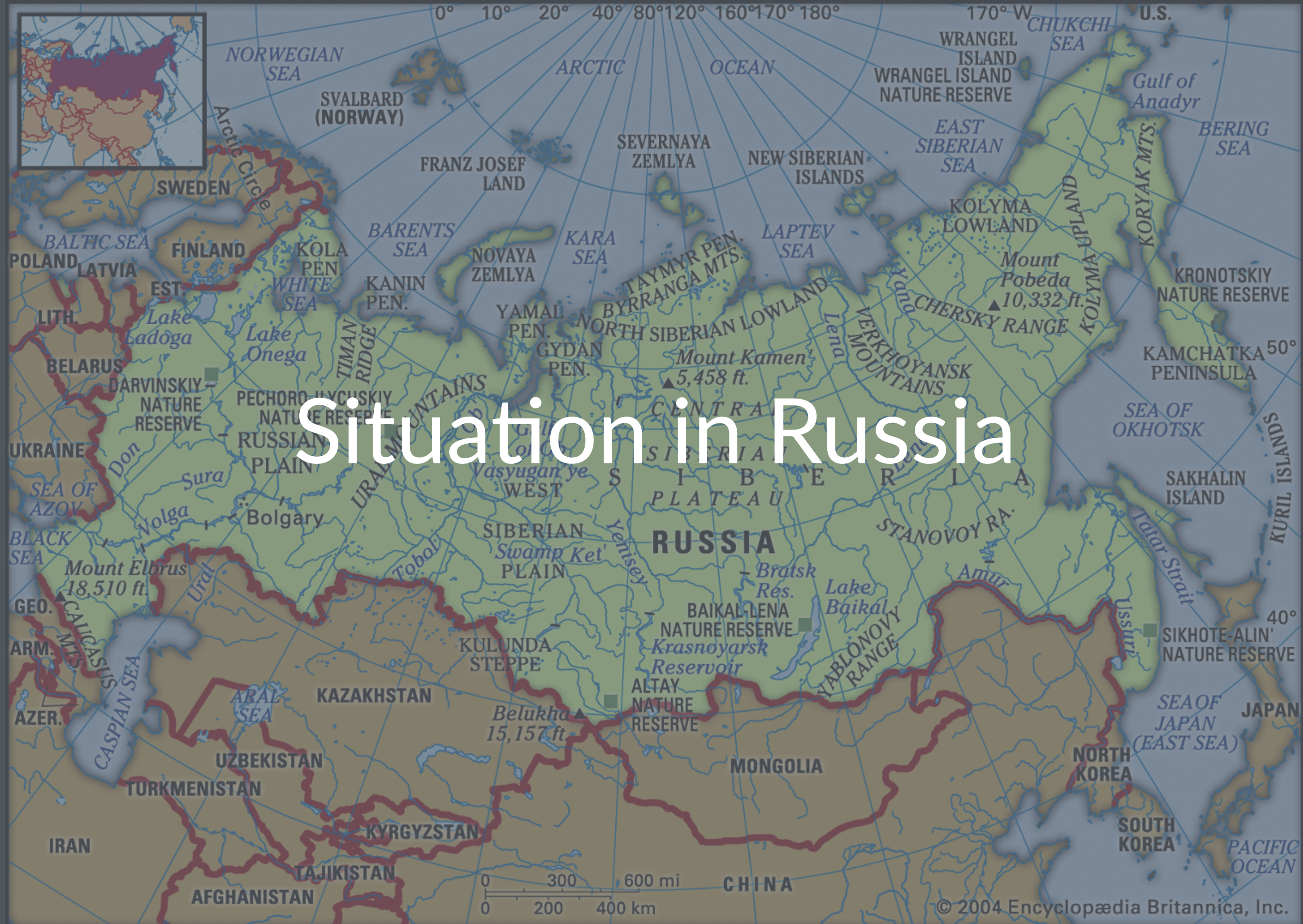
- Diesel exhibits some seasonality
 - Higher peaks in the spring and fall
- Diesel seasonality is not as strong as for gasoline

Gasoline Seasonality



Gasoline seasonality

- Gas prices rise during the summer driving seasonality
- This result has been true for many years

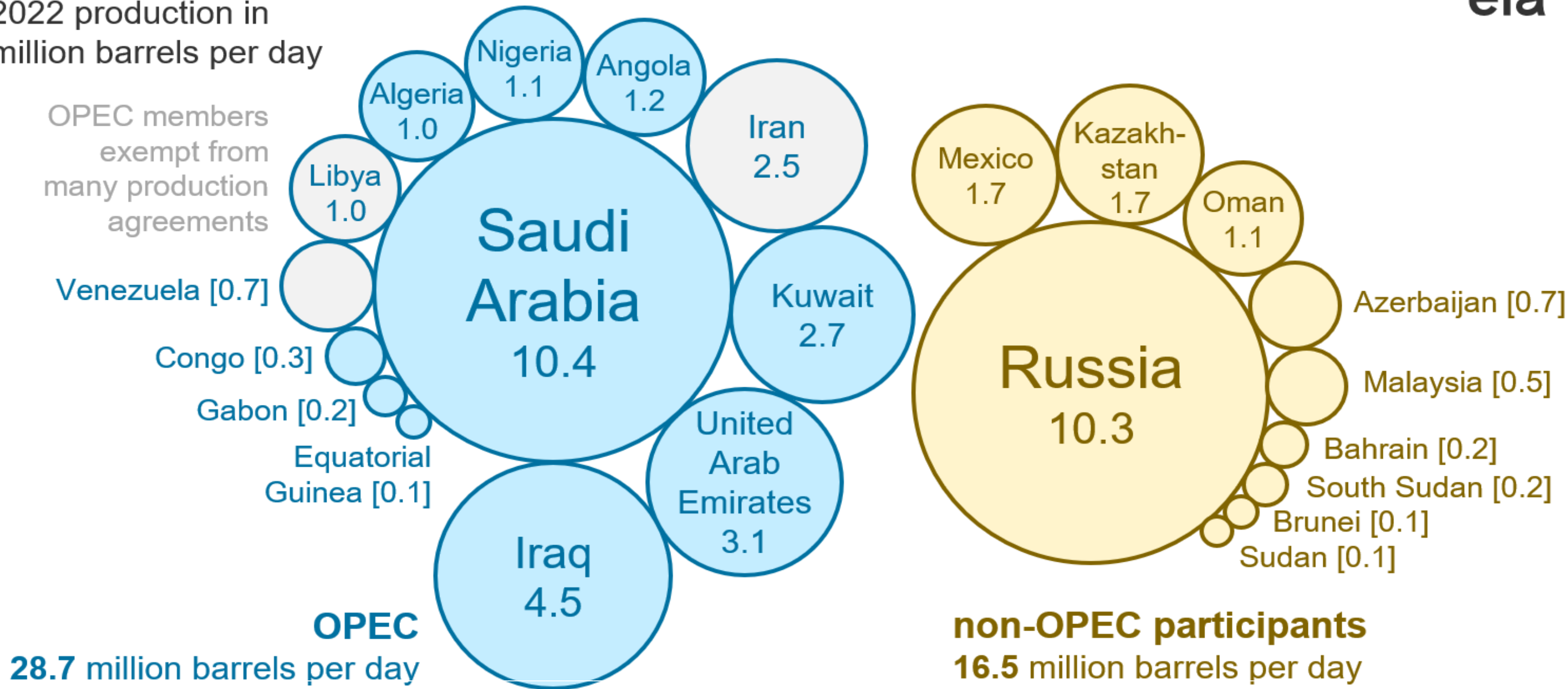


Situation in Russia

Total oil production from OPEC+ (OPEC and non-OPEC participants)

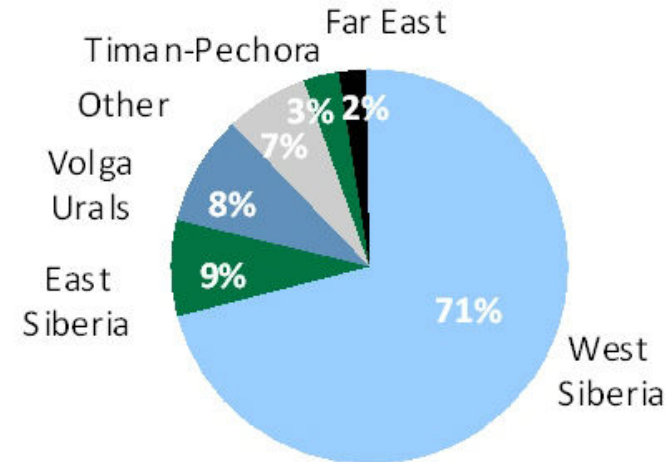


2022 production in
million barrels per day

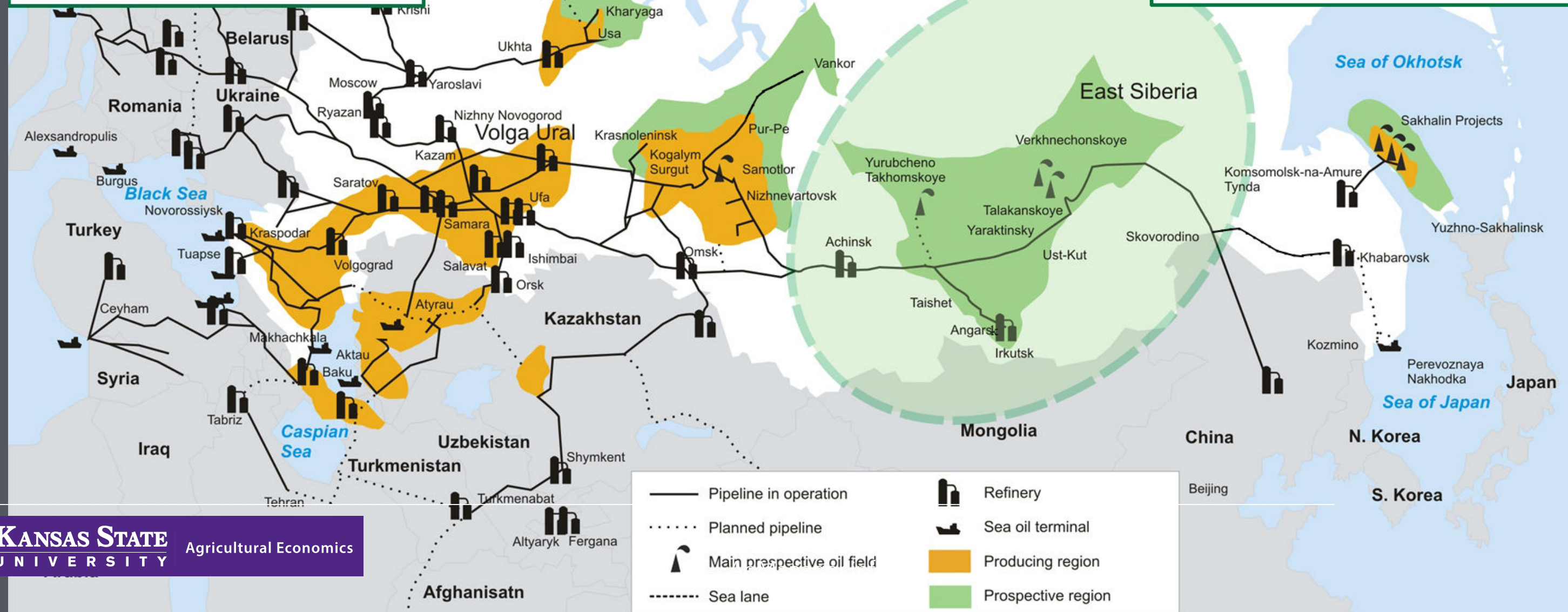
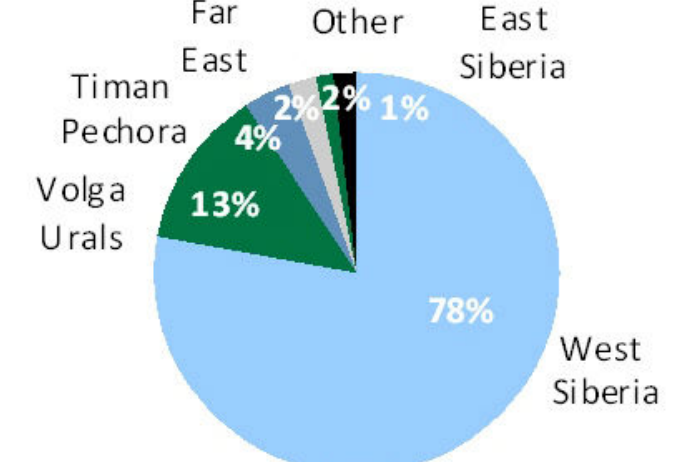


Map of Russian Oil & Gas Provinces

Proved Reserves by Province



2009 Production by Province



Little change in production

- Oil is a fungible commodity
 - Difficult to make tariffs work
- Selling more to India, China and other countries
- Tariffs are unlikely to make much difference
 - Russia faces world market price
 - Perhaps some discounts to sell to China
 - The mainstream press doesn't get this as evidenced by the CNN article



The Kremlin has never been richer – thanks to a US strategic partner

Nick Paton Walsh and Florence Davey-Attlee, CNN

Mon, February 19, 2024 at 6:31 PM CST · 7 min read



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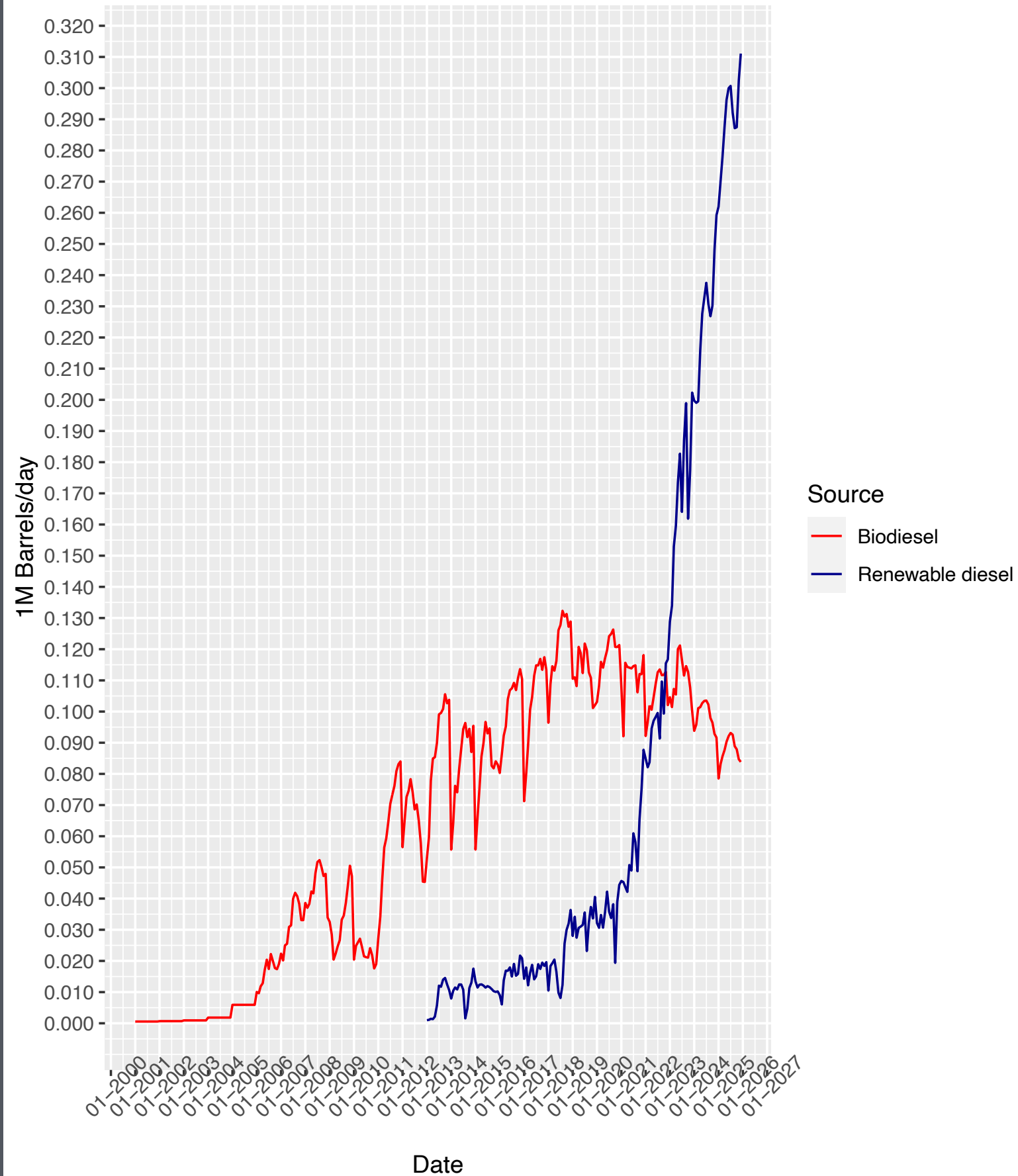
Bio and Renewable Diesel



HIGH PERFORMANCE RENEWABLE

Biodiesel and Renewable diesel Production

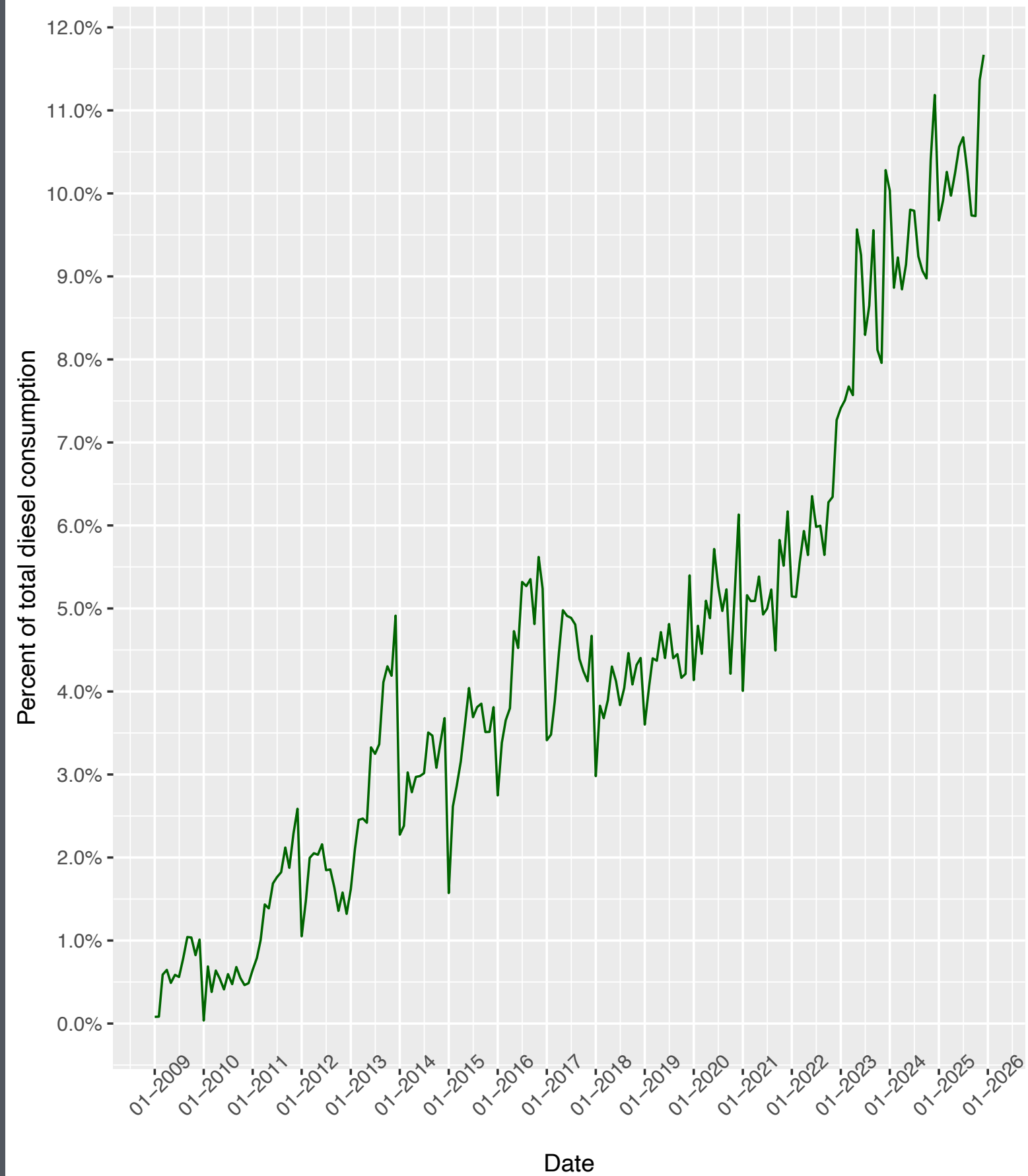
includes 2 year EIA forecast



Biodiesel and Renewable Diesel

- Strong potential for a fossil fuel replacement for diesel
- Biodiesel may be peaking
- Renewable diesel looks to have a bright future

Combined Biodiesel and Renewable diesel Consumption
includes 2 year EIA forecast



Percent of total diesel

- Small but growing!

Questions?

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