

North Dakota Energy Situation and Outlook

David Ripplinger

State of the Economy

November 18, 2020

Key Points

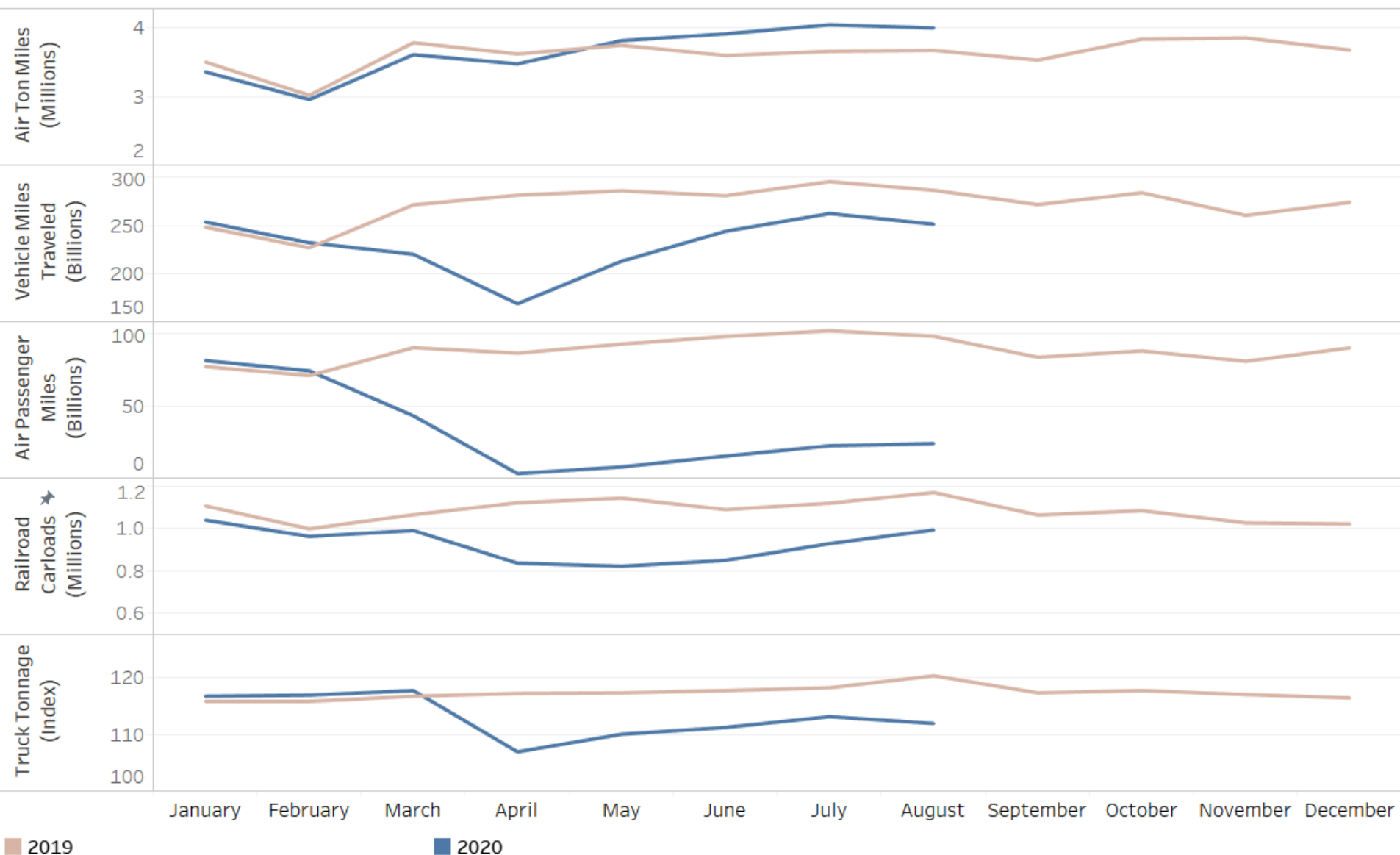
- North Dakota as energy supplier
- Covid as

Disruptor – causing unexpected short and long-term impacts

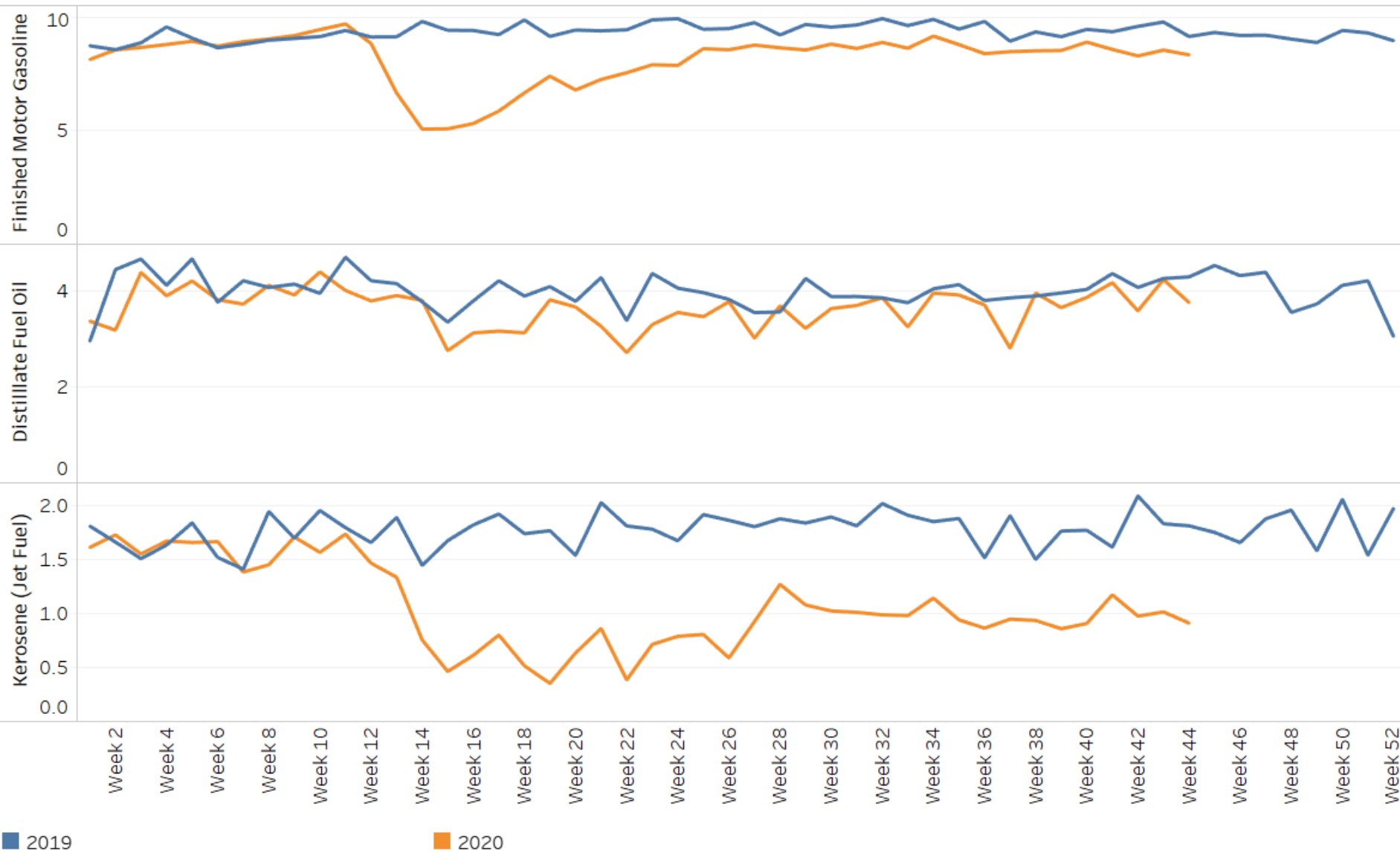
Accelerator – speeding changes that were expected

- Economic and social uncertainty
- Energy Transition – Technology, Resources, and Policy

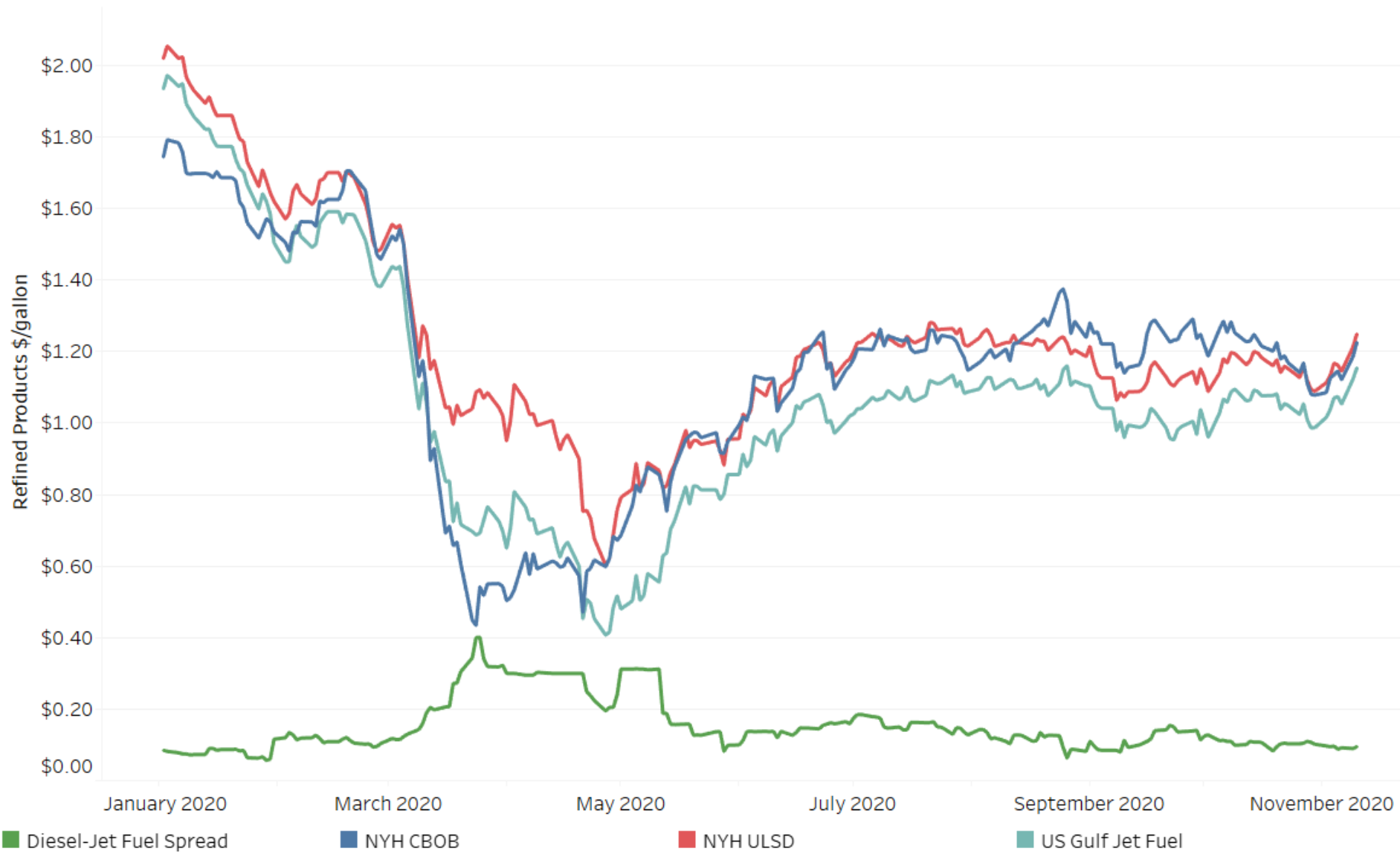
US Transportation Statistics, 2019-2020



US Refined Products Supplied (mmbbbls/d)



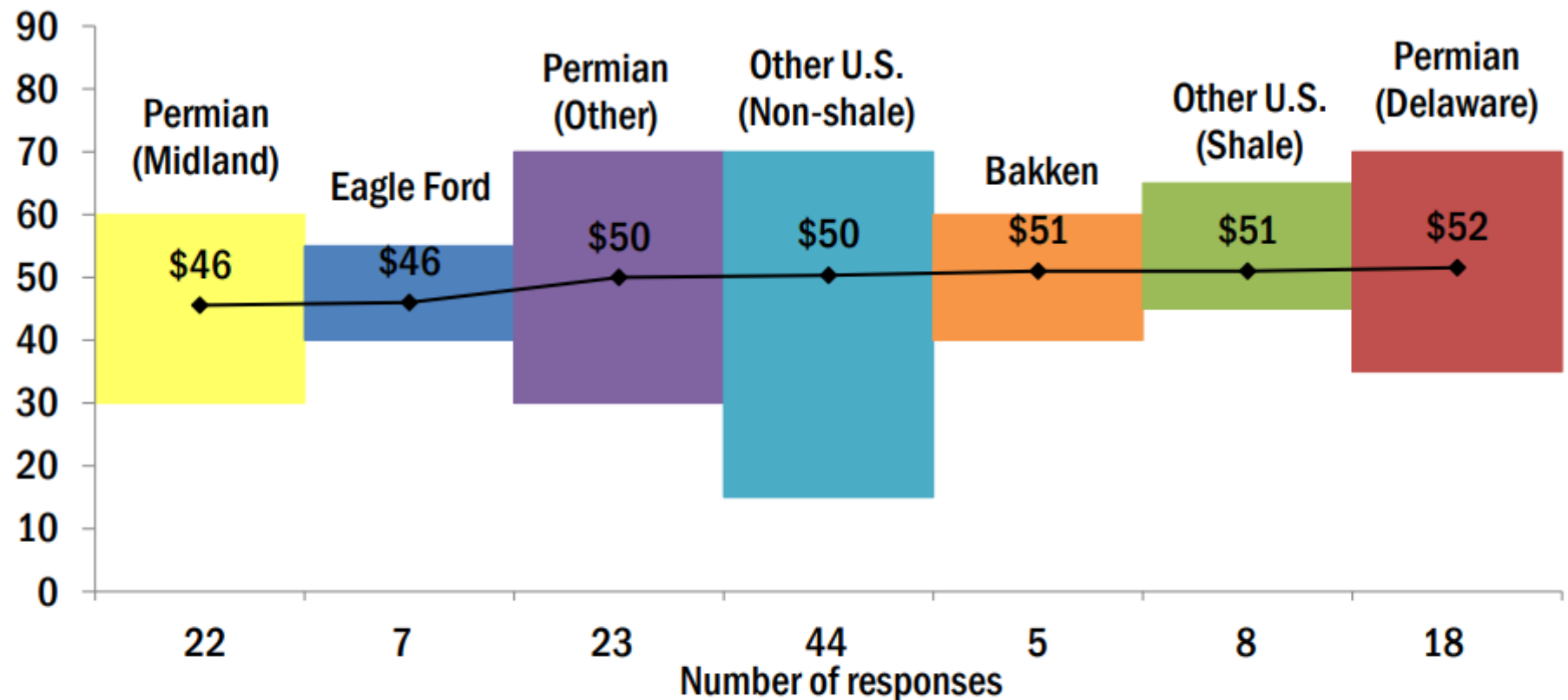
US Refined Products Prices, Diesel-Jet Fuel Spread



Breakeven Prices for New Wells

Dallas Fed Energy Survey—In the top two areas in which your firm is active: What WTI oil price does your firm need to profitably drill a new well?

Dollars per barrel



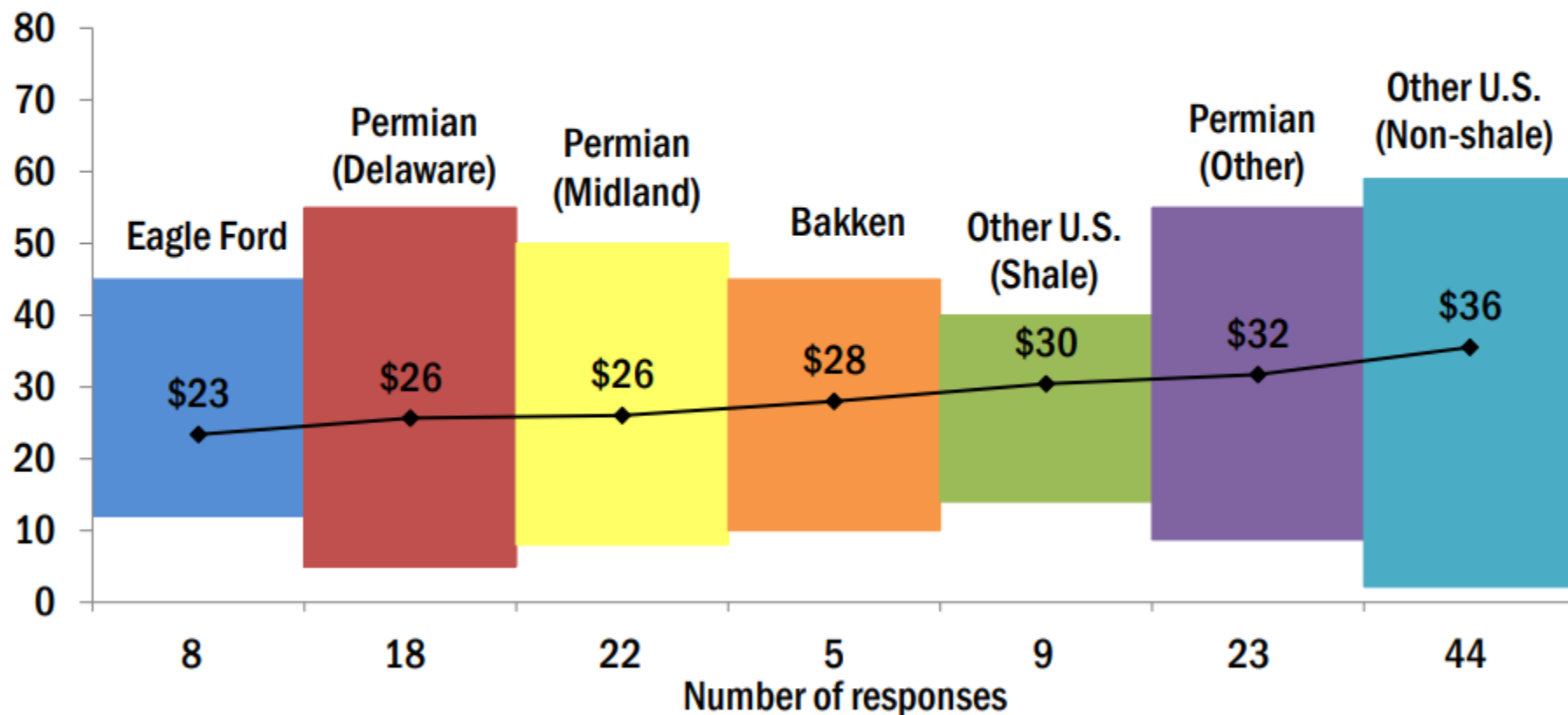
Federal Reserve Bank of Dallas

NOTES: Line shows the mean, and bars show the range of responses.
92 E&P firms answered this question from March 11-19, 2020.
SOURCE: Federal Reserve Bank of Dallas.

Shut-in Prices for Existing Wells

Dallas Fed Energy Survey—In the top two areas in which your firm is active: What WTI oil price does your firm need to cover operating expenses for existing wells?

Dollars per barrel



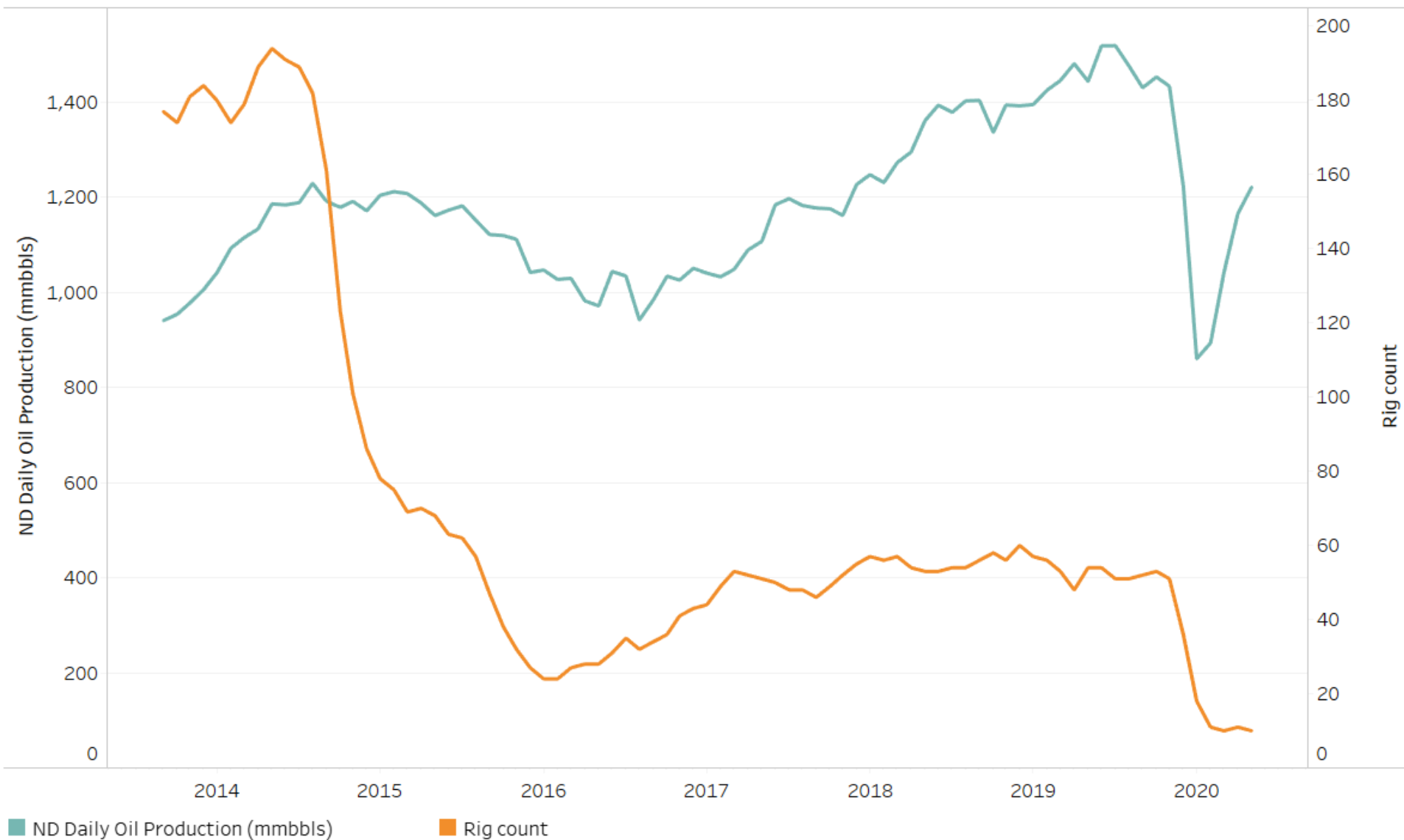
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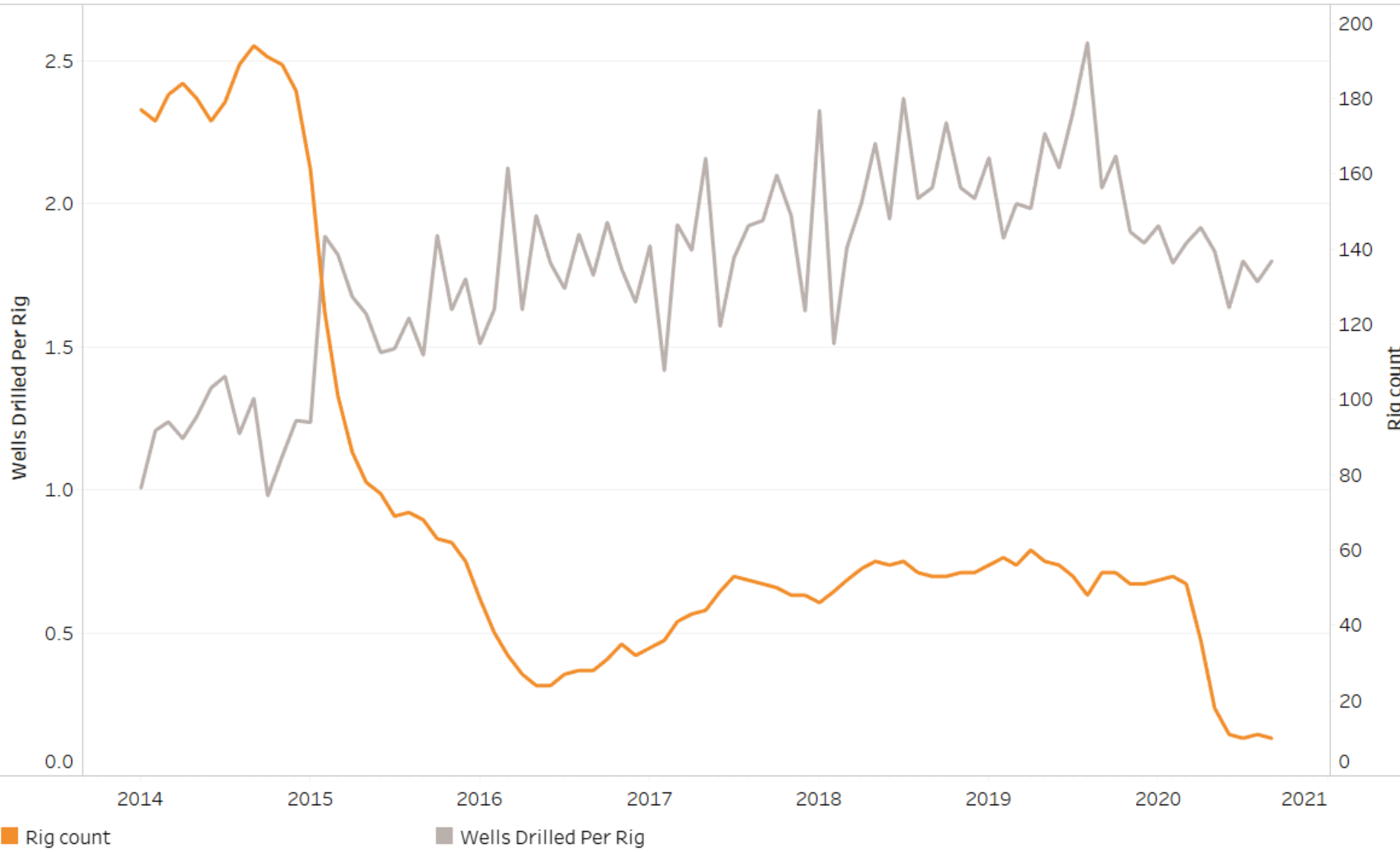
WTI Spot Prices, 2014-2020



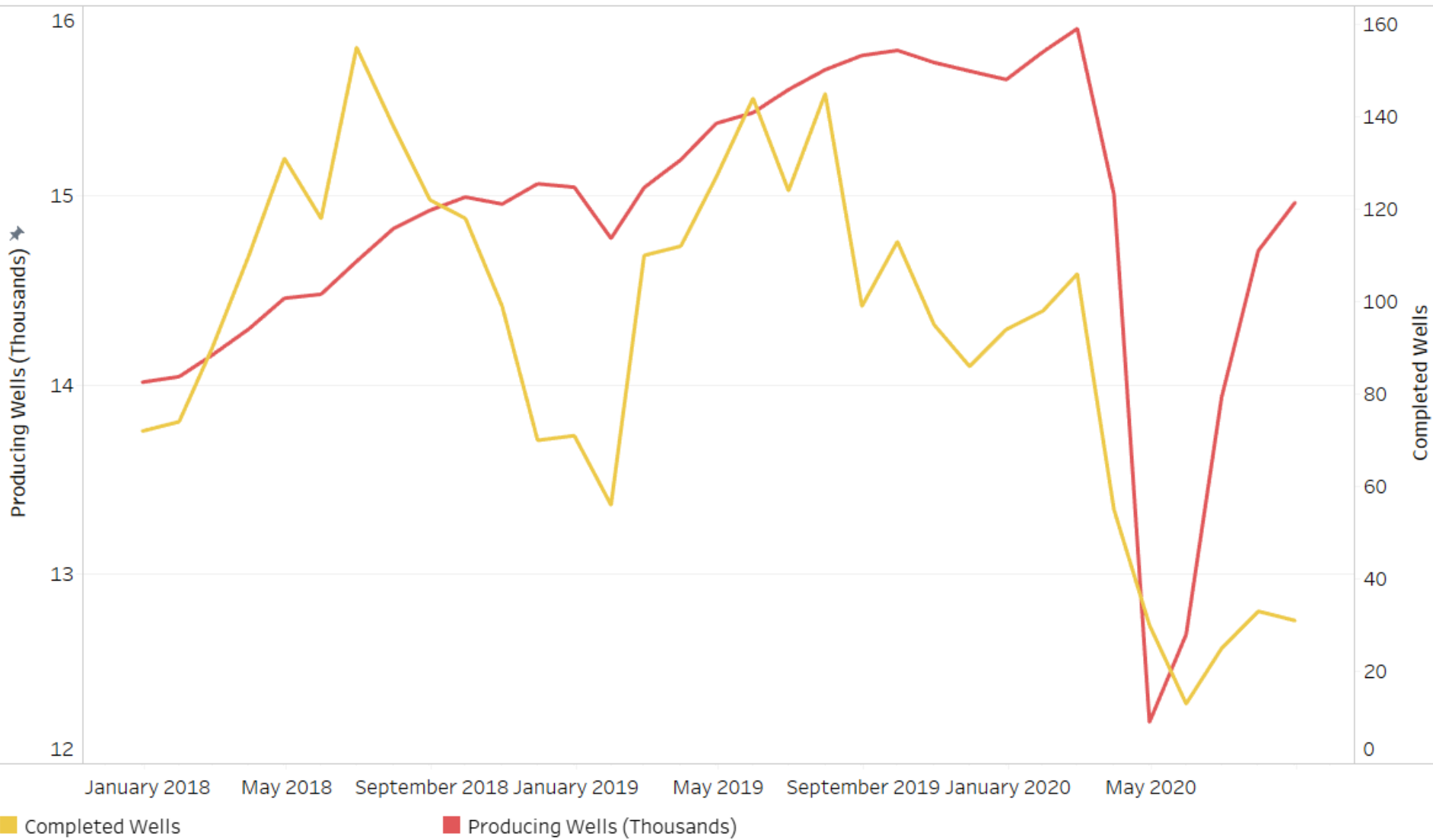
ND Rig Count and Oil Production



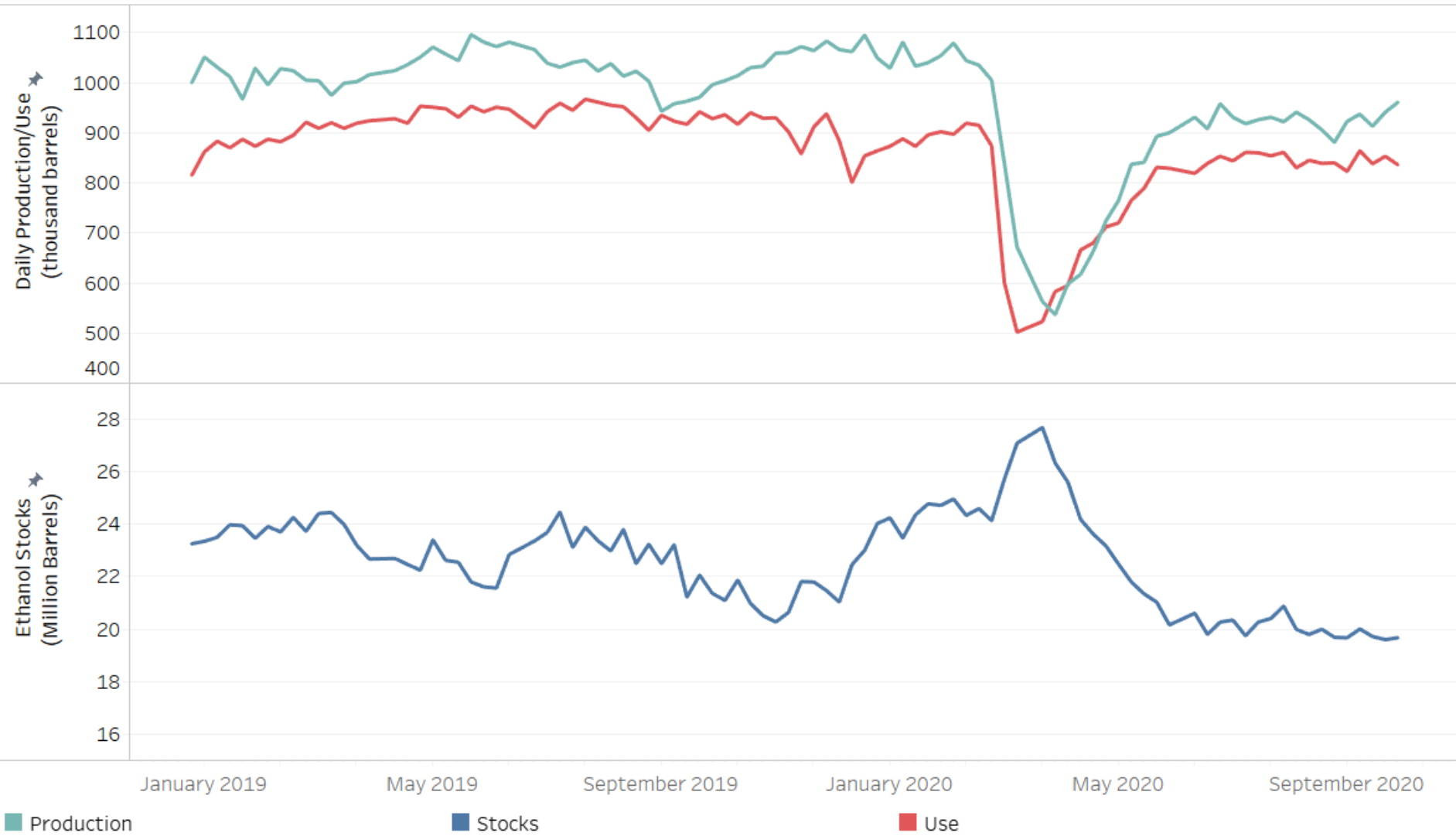
Rig Count, Wells Drilled Per Rig, ND 2014-Present



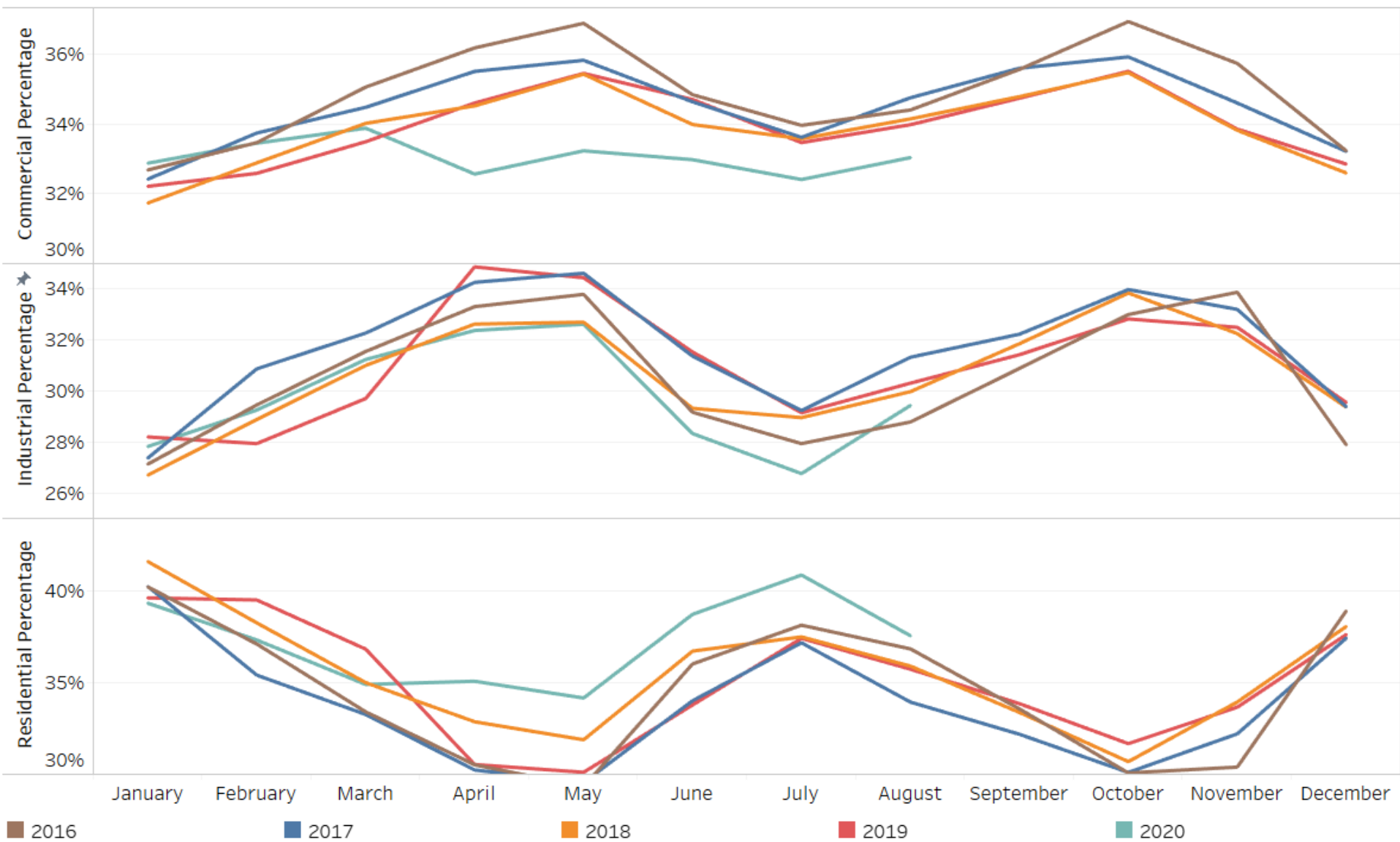
ND Completed and Producing Wells.



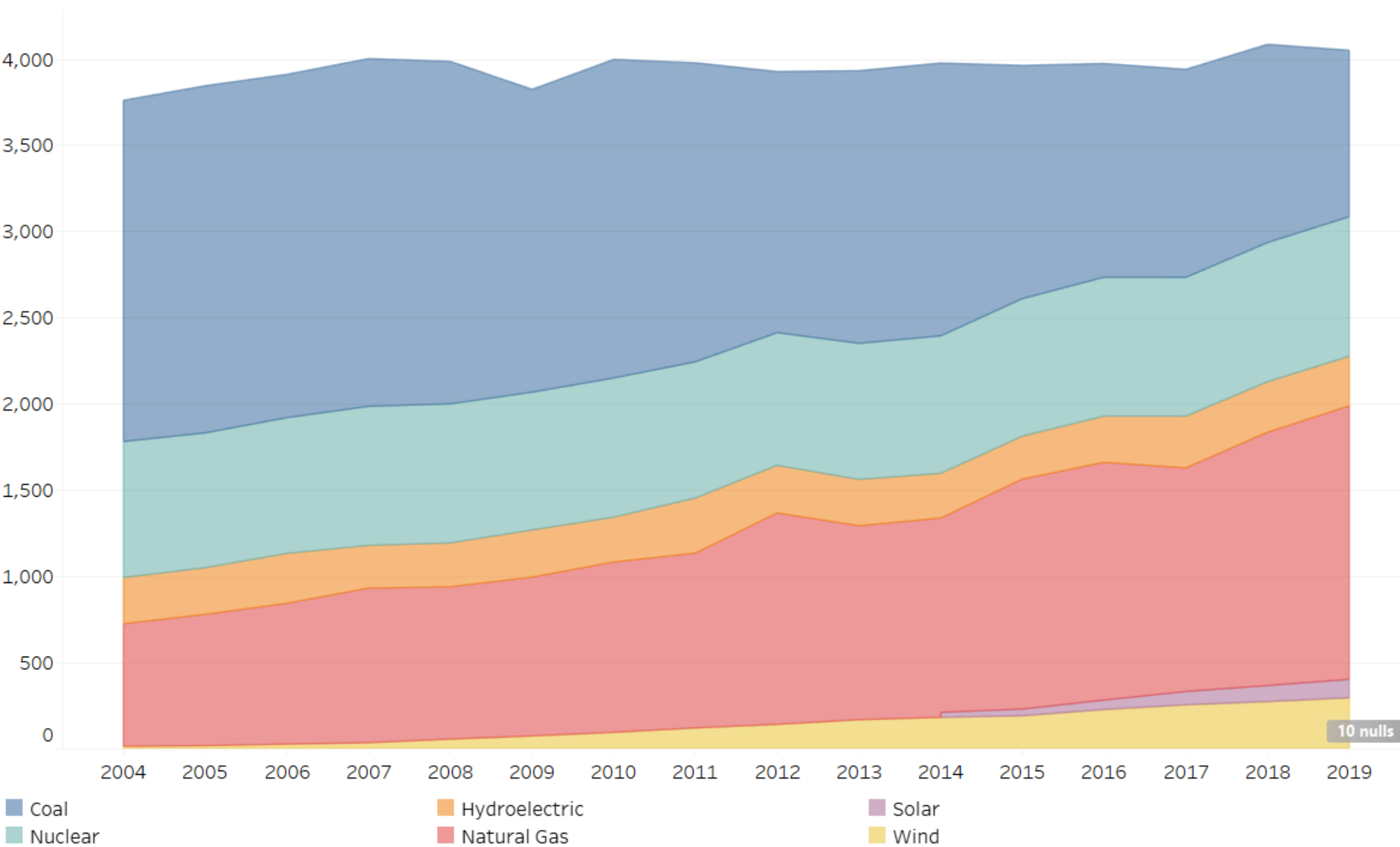
US Ethanol Production, Use, and Stocks, 2019-2020



Relative Electricity Use by Sector, US 2016-2020



US Net Generation, 2014-2020



Coal Power Plant Retirements

Announced in 2020

Coal Creek (Great River Energy)

Dakota Spirit, Spiritwood (GRE) to be converted to fully natural gas

Previously Announced

Stanton Station (GRE)

Lewis & Clark Station (Sydney, MT)

R.M. Heskett to be replaced with natural gas units

Outlook

A note on horizons

Short-term (next 12 to 18 months)

Long-term Next Decade, Next Thirty Years

Oil Outlook

Short-term: Covid-19

Economic Recovery (by end of 2021)

OPEC

Iran

Policy

Long-term: Consumer Behavior

Technology

Resource availability

Policy

2021 Oil Prices

West Texas Intermediate (WTI) crude oil price and NYMEX confidence intervals
dollars per barrel

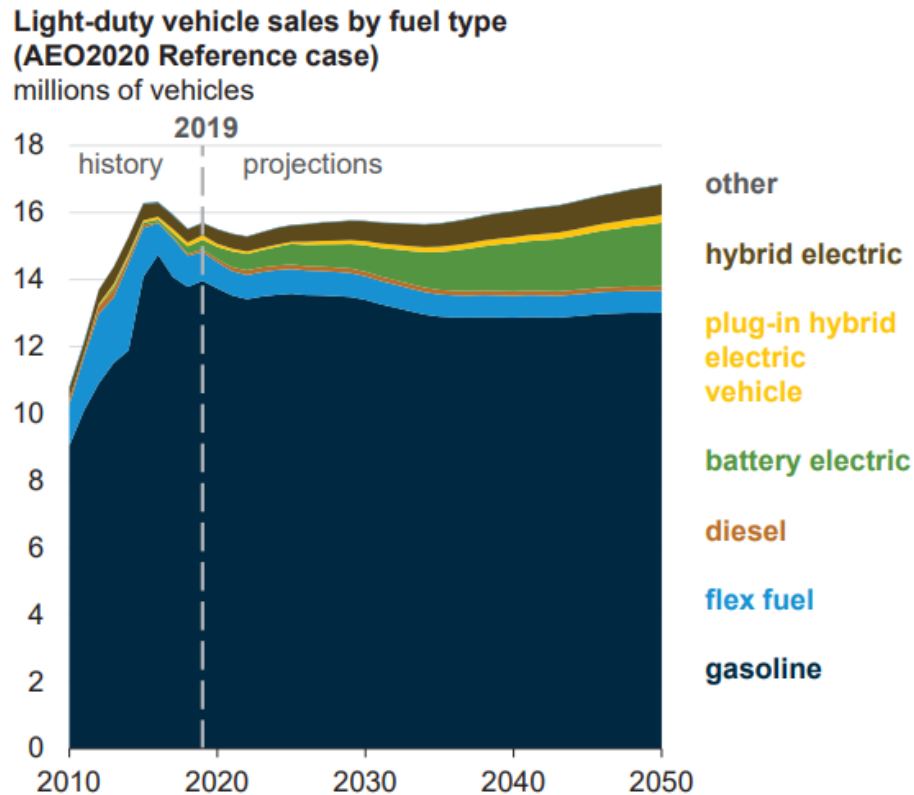


Note: Confidence interval derived from options market information for the five trading days ending Nov 5, 2020. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Sources: U.S. Energy Information Administration, Short-Term Energy Outlook, November 2020, CME Group, and Bloomberg, L.P.



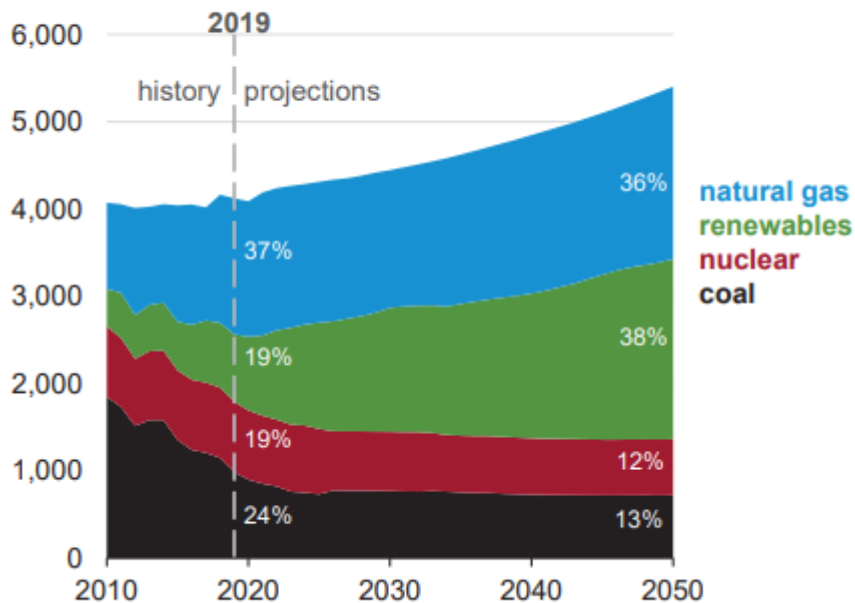
Electrification of Transportation



Electricity

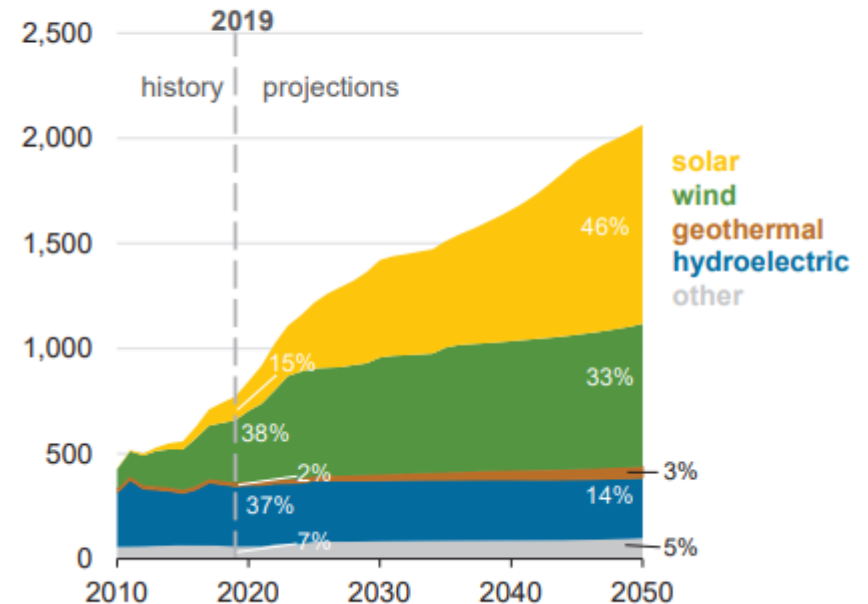
**Electricity generation from selected fuels
(AEO2020 Reference case)**

billion kilowatthours



**Renewable electricity generation, including end use
(AEO2020 Reference case)**

billion kilowatthours



California Low Carbon Fuel Standard



California has assumed international leadership

Nation's largest transportation fuel market (~10% of the total)

Goal: Reduce the Greenhouse gas emissions associated with transportation

Uses a Cap and Trade system

Works, legally tested, “built” and is serving as a model for other states and nations

CCUS

Given the high price of carbon, there are projects across the globe looking at ways to capture use/sequester carbon.

Among the highest profile is Project Tundra that is looking to manage carbon emissions from MinnKota Power's Milton Young Station

Blue Flint Ethanol (near Underwood) is looking to do the same as is Red Trail Ethanol.



New carbon capture project could help corn growers



carbon capture project could help corn growers (KFYR-TV)

By [Morgan Benth](#)

Published: Oct. 18, 2020 at 3:59 PM CDT | Updated: 14 hours ago



BISMARCK, N.D. (KFYR) - A new carbon capture project across from the Blue Flint et

Renewable Diesel

The recent price of renewable diesel in California is _____.

Renewable diesel is biofuel produced using various bio-based feedstocks (vegetable oil, grease, fat) and traditional crude oil refining processes.

Meets diesel spec. Has an extremely low carbon footprint.

Proposal would convert Dickinson oil refinery to renewable diesel

AMY DALRYMPLE Bismarck Tribune Aug 1, 2018

SALE! Subscribe for \$1/mo.



The Andeavor Dickinson Refinery is located 4 miles west of Dickinson.

FORUM NEWS SERVICE, 2014 FILE PHOTO

Hydrogen/Ammonia

Renewed interest in hydrogen fuel cell technology

-Use of hydrogen as fuel/converted to electricity

Three colors

Grey Hydrogen – fossil fuels

Blue Hydrogen – fossil fuels, low-carbon
(sequestration)

Green Hydrogen – renewables

Policy - What to Watch for

Georgia Runoff Elections

Regulation

DAPL

Net Zero

Clean Power Plan

Courts

States, Net Zero

15 Years Ago



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