

API Industry Outlook

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Key points

Economy

- **Recently lowered economic expectations still reflect above-average rates**
 - Russia's war in Ukraine advanced the economic consensus' expectations for higher price inflation and slower global GDP growth
 - Bloomberg consensus and IMF downgraded 2022 global growth by 0.8% y/y to 3.1% y/y
 - Uncertainties: geopolitics, price inflation, U.S. dollar exchange value, global debt

Oil

- **As solid global oil demand is expected to reach record highs in 2023 per EIA, supply challenges have persisted for oil and natural gas production**
 - Global demand of 98.8 million barrels per day (mb/d) in Q2 2022, projected to grow to a record high 102.7 mb/d in Dec. 2023 per EIA
 - Headwinds: lower U.S. rig productivity and fewer drilled but uncompleted wells in Q2 2022 per EIA; cost escalation per BLS
 - Protracted work force, supply chain, financial, and adverse energy policies
 - Uncertainties: Effective Russian production losses; potential OPEC and U.S. growth
- **U.S. petroleum net exports reached a record high 1.4 mb/d in April 2022**
- **U.S. refining activity has risen to meet demand**
 - Weekly capacity utilization rates in June as high as 94.3%, 7.3% above its 5-year average

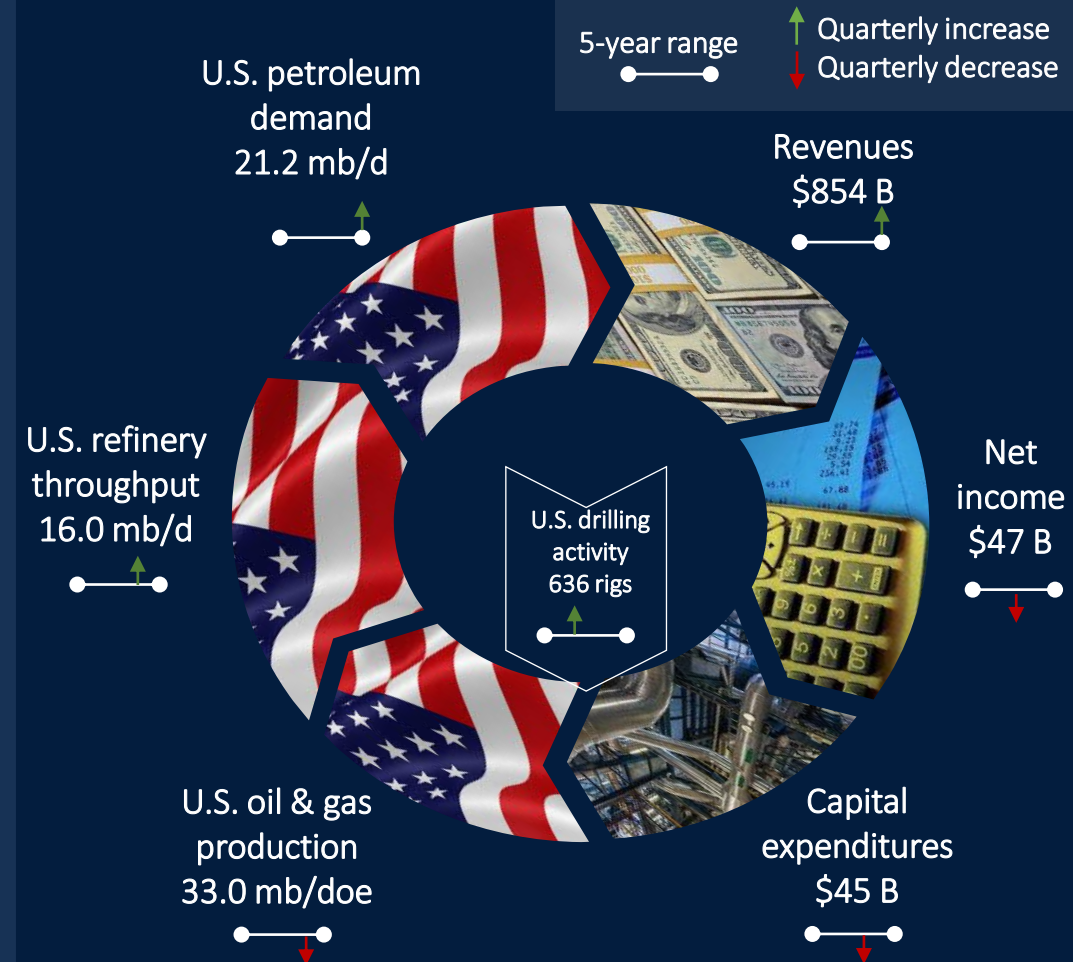
Natural gas

- **Global natural gas prices** rose in Q2 2022 to around \$9 per million Btu (mmBtu) in the U.S. and remained over \$20 per mmBtu in Asia and Europe
- **EIA projects natural gas to remain competitive** in U.S. power because coal prices could remain elevated

First Quarter 2022 by the numbers

Benchmark price averages

Brent crude oil: \$101.17 per barrel WTI crude oil: \$95.18 per barrel
NGL composite: \$11.05 per mmBtu Natural gas (Henry Hub): \$4.84 per mmBtu



• Financial compilation based on API 200 companies with shares listed on U.S. stock exchanges.
sources: EIA; API Monthly Statistical Report; Bloomberg and company reports; Baker Hughes; API Team analysis

Key implications

For consumption

- A technical global recession – that is, economic contraction – could be uneven across economies and elevate systemic risks
- The pulse of energy demand, including oil and natural gas, depends on the level of overall growth, which appears historically strong
- A recurrent theme: a combination of demand outpacing supply, low inventories and higher imports has historically been a recipe for upward price pressures
- U.S. monitoring of short-term trends, especially distillate inventories on the East Coast

For production

- With work force, supply chain, financial and policy headwinds, accelerated rig activity has not yet significantly raised U.S. oil and natural gas production
- If 2022 demand remains near its 2019 levels, greater drilling activity is likely to be needed given EIA's estimated decreases in rig productivity and lower inventories of drilled but uncompleted wells
- While most focus is on elevated commodity prices, the key to a successful supply response could hinge on factors that enable capital project execution, including lower steel trade/tariffs, increased labor mobility, and renewed North American energy relationships

For economics and energy policies

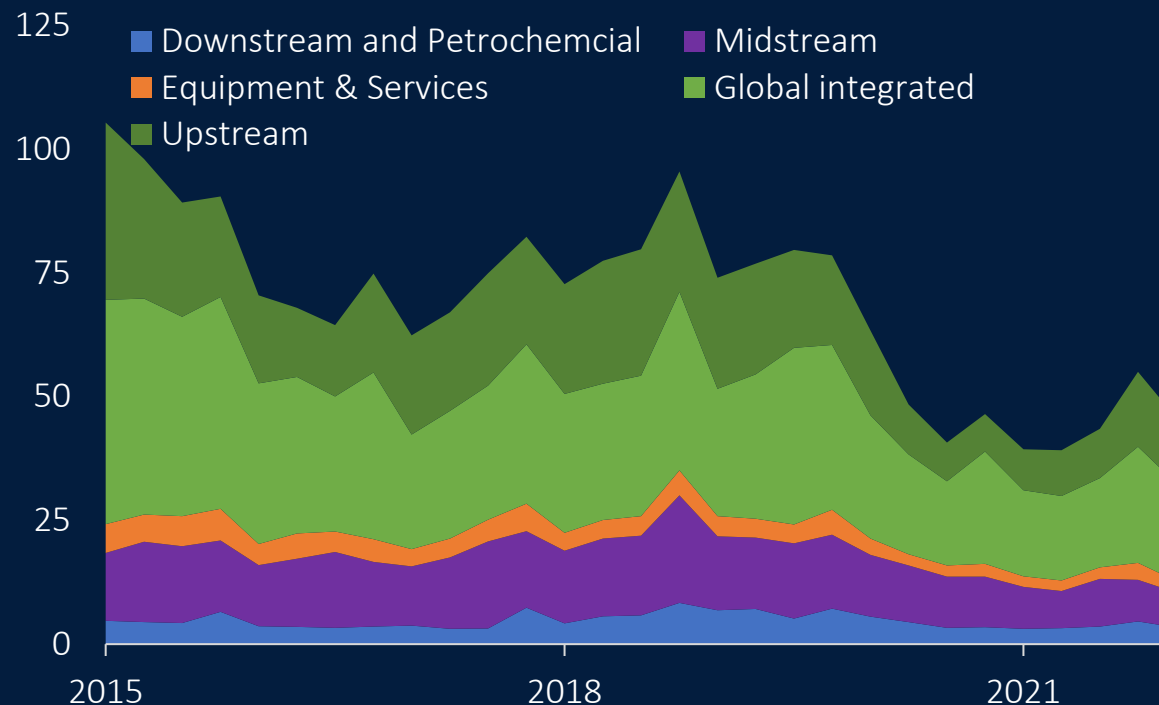
- Currently with the lowest commercial U.S. oil inventories since 2014 and SPR since 1987 – and global inventories below their 5-year range – U.S. economic and energy security requires a laser focus on policies to support healthy production, pipeline infrastructure, and trade

In Q1 2022, the natural gas and oil industry had capital expenditures of \$44.6 billion, and the backlog of U.S. projects under construction shrank

- The industry invested \$44.6 billion in Q1 2022, compared with \$35.7 billion in Q1 2021
- Across the energy value chain, API is monitoring 102 oil & gas-related projects currently under construction worth \$145 billion

Capital expenditures by industry segment

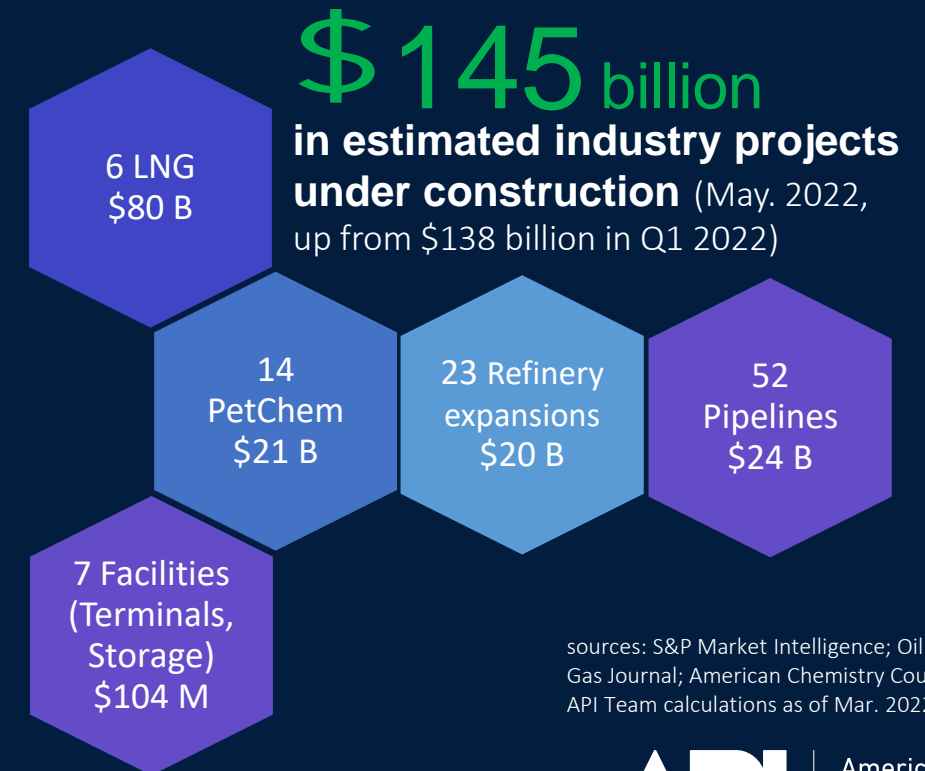
Billion dollars (2022\$)



* All other oil & gas industry companies

sources: Bloomberg; publicly-available company reports; BLS

\$145 billion in current U.S. energy infrastructure investments



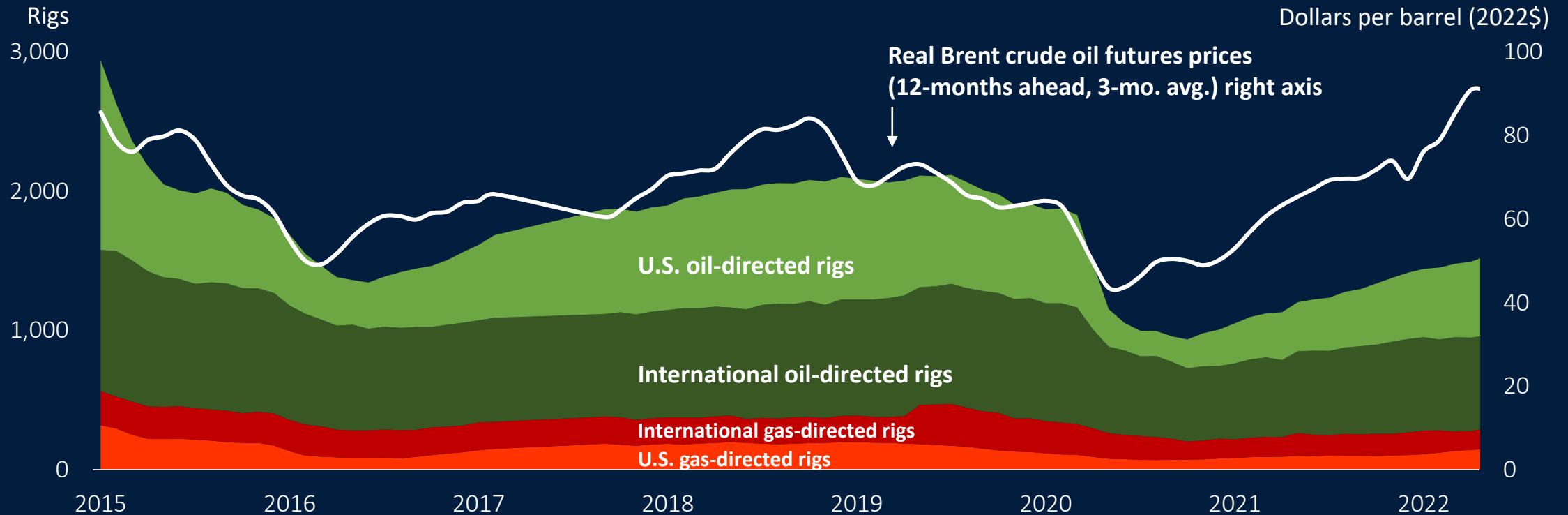
sources: S&P Market Intelligence; Oil & Gas Journal; American Chemistry Council; API Team calculations as of Mar. 2022

Global drilling activity has continued to lag its 2019 levels and historical price responsiveness



- In May 2022, global oil & gas drilling activity was down by 27.3% compared with May 2019. Changes vs. 2019 by segment:
 - U.S. oil drilling (-29.1%)
 - U.S. natural gas drilling (-19.1%)
 - International oil drilling (-20.9%)
 - International natural gas drilling (-47.0%)

Global oil drilling activity and Brent crude oil prices, monthly



Upstream cash flow constraints and high indebtedness are two likely reasons why drilling has been less responsive than it historically has been



- Q4 2014 and Q1 2022 had similar oil prices when adjusted for price inflation

Comparing company financials in 2014 versus 2022

Upstream free cash flow constraints

Q4 2014

70% of upstream companies outspent their cash flows

Q1 2022

84% of upstream companies operated within their cash flows



Upstream indebtedness rose

Q4 2014

The median upstream company's debt equaled **67%** of its total equity

Q1 2022

The median upstream company's debt equaled **80%** of its total equity





Global Economy

What we're watching now – Consider the possibility of an economic recession to above-average global growth levels



- Key themes this quarter are: 1) forward-looking macroeconomic risks, particularly to emerging markets; 2) a critical debate over GDP growth projections; and 3) prospects for global oil demand growth amid low inventories and a loss of supplies

World Economic Outlook

Several priority areas for action:

- Early detection of significant financial risks that may be hidden
- “The biggest challenge is sovereign debt restructuring. The absence of a predictable, orderly, and rapid process for sovereign debt restructuring is costly, dampening recovery prospects and creating uncertainty”
- The corporate–government nexus is another potential source of contingent liabilities and hidden debt

“Emerging economy firm surveys reveal that many businesses expect to be in payment arrears in the coming months, and so private debt could suddenly become public debt as in past crises”

International Monetary Fund, May 2022

World Bank Warns of Global Recession, Stagflation

- The World Bank projected global real GDP growth of 2.9% y/y in 2022, which is above the long-run historical average rate

“The war in Ukraine, lockdowns in China, supply-chain disruptions, and the risk of stagflation are hammering growth. This is the sharpest slowdown in 80 years...and it's really hitting the poorer countries hard”

- “Markets look forward, so it is urgent to encourage production and avoid trade restrictions. Changes in fiscal, monetary, climate and debt policy are needed to counter capital misallocation and inequality”

World Bank, June 2022

Oil Market Report, May 2022

- 2022 “world oil demand growth is...expected to increase by 1.8 mb/d on average to 99.4 mb/d
- “Despite mounting international pressure and falling oil production, Russian exports have so far held up by and large. But now major trading houses are winding down deals ahead of a 15 May deadline to halt all transactions with state-controlled [entities]. Following a supply decline of nearly 1 mb/d in April, losses could expand to around 3 mb/d during the second half of the year
- Global observed oil inventories declined by a further 45 mb during March and are now a total 1.2 billion barrels lower since June 2020

International Energy Agency, May 2022



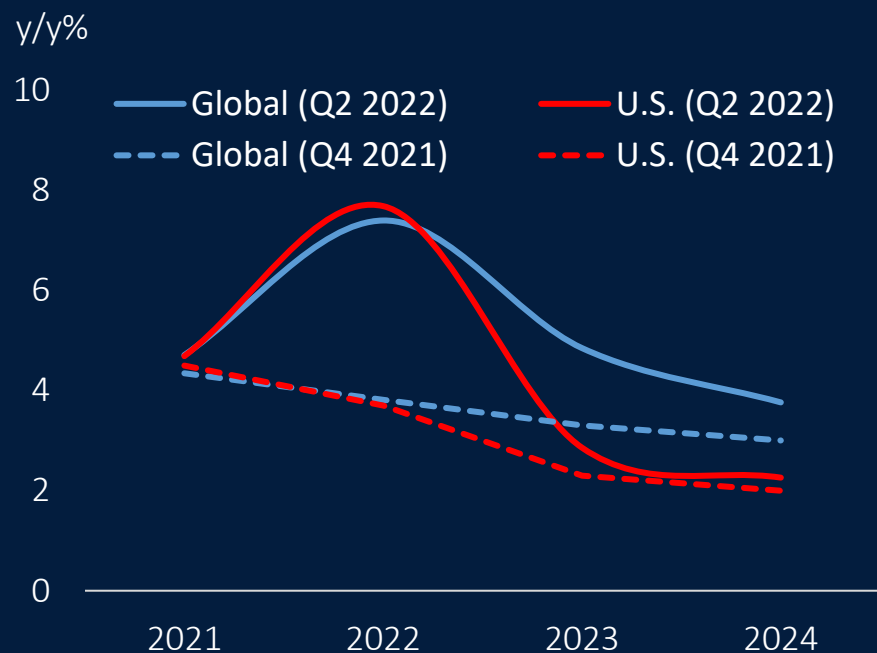
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Consensus expectations are for elevated price inflation and progressively slower global growth, with Russia's war on Ukraine clipping 0.8% off 2022 growth



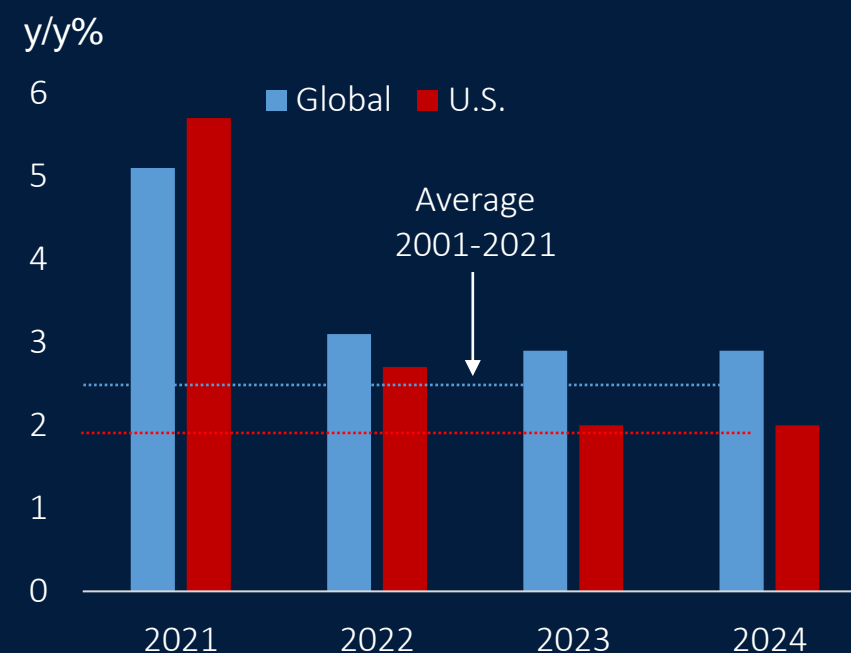
- IMF and consensus estimates have increased their expectations for protracted consumer price inflation
 - Global consumer price inflation estimates rose by 3.5% for 2022, 1.5% for 2023 and 0.8% for 2024
- As price inflation has persisted and economic stimulus wears off, the consensus expects economic slowing through 2024

Consumer price inflation



sources: IMF; Bloomberg

Real GDP growth*



* Market exchange rate basis aggregated for 204 countries, compiled May 2022
sources: IMF; Bloomberg; API Team calculations



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Oil Markets



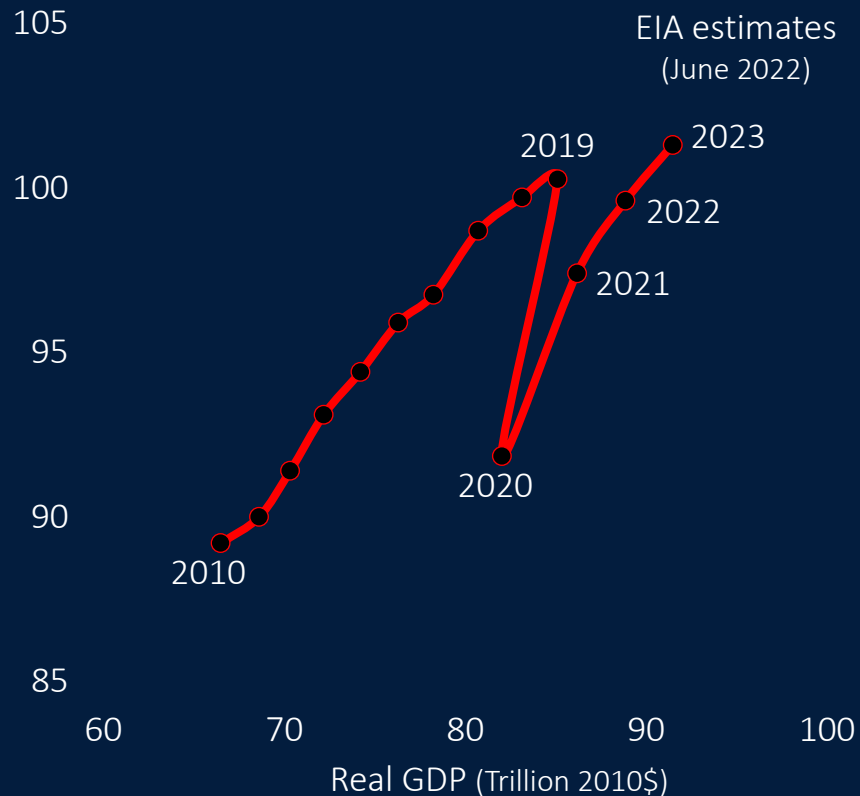
Despite downward revisions, global oil demand could near a record high in 2023 per EIA



- ▶ Despite slower expected economic growth, EIA expects global oil demand of 99.6 mb/d in 2022 (up by 2.3 mb/d from 2021) and a record-high of 101.3 mb/d in 2023
- ▶ Balancing global oil markets could require supply growth of 2.6 mb/d by OPEC and 1.3 mb/d from the U.S. per EIA

Global oil demand and GDP

Million barrels per day

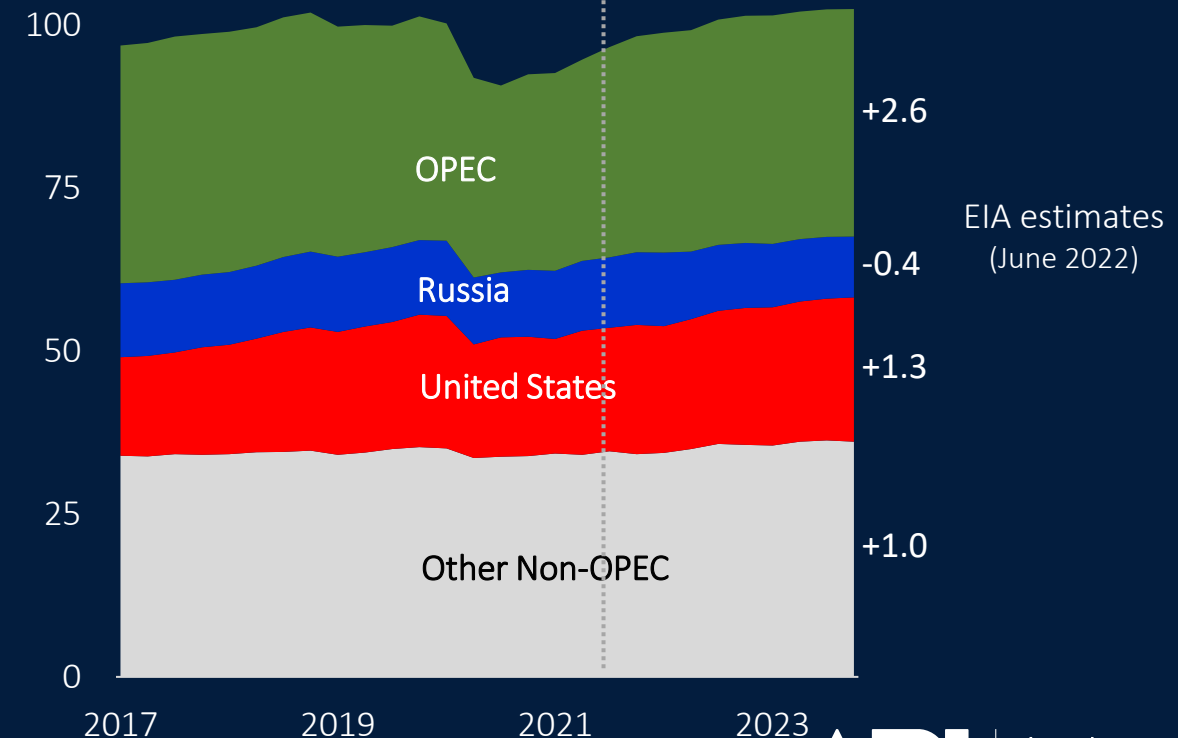


*Market exchange rate basis

sources: EIA; Bloomberg; IMF; API Team calculations

Global oil production

Million barrels per day



source: EIA



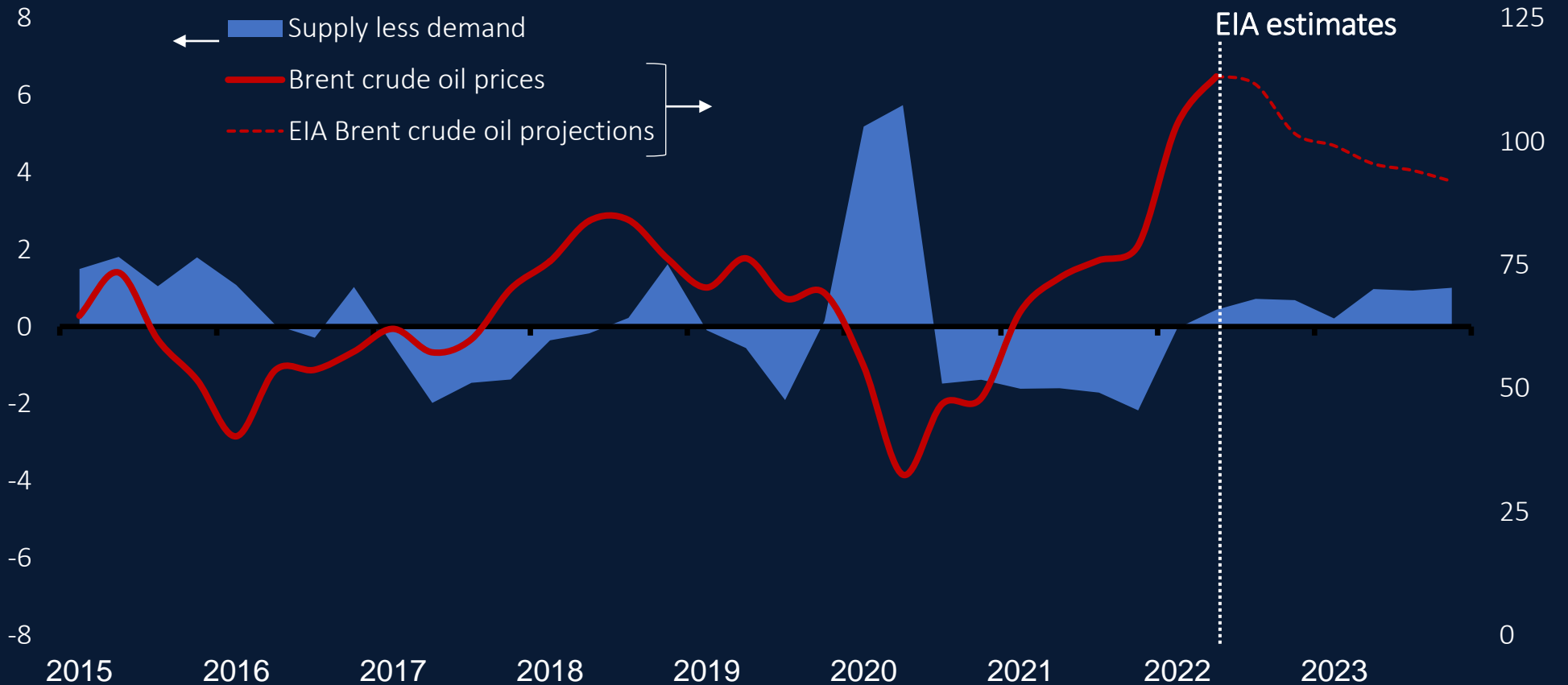
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EIA expects the global oil supply/demand balance to support prices of \$107 per barrel in 2022 and \$97 per barrel in 2023



EIA global supply/demand and Brent price estimates as of June 2022

Million barrels per day (mb/d)



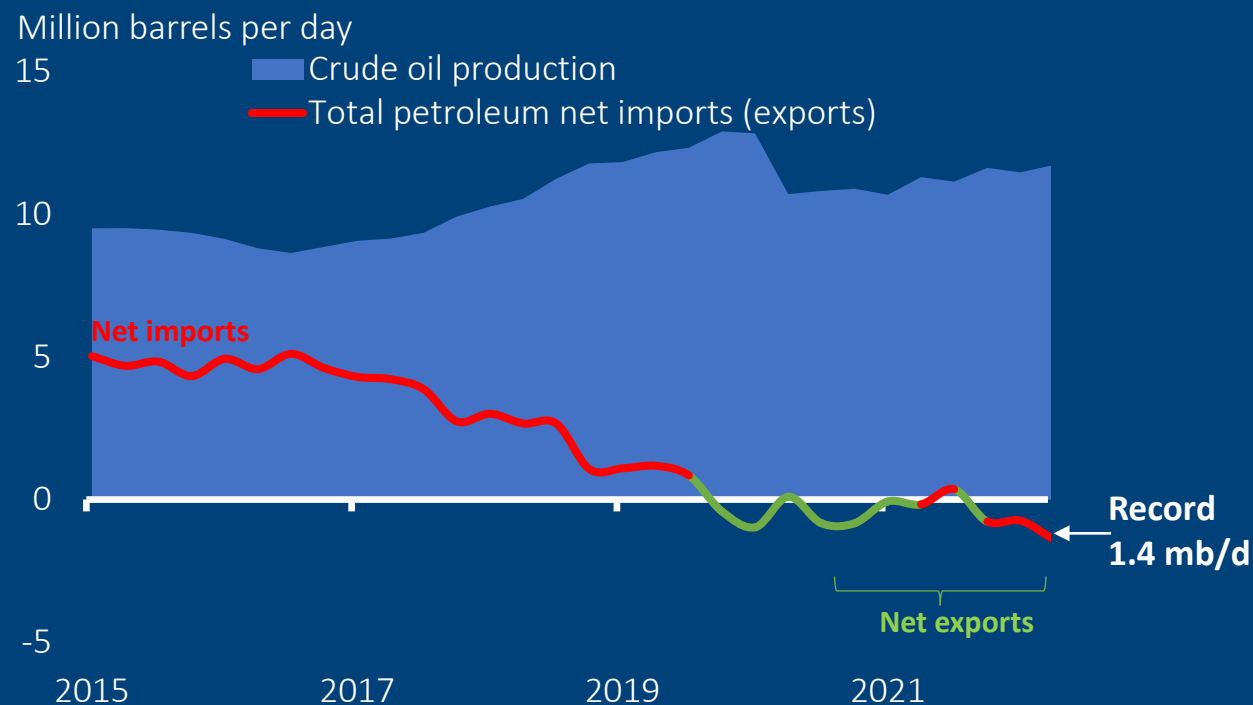
sources: EIA STEO (June 2022); CME Group; Bloomberg; Bureau of Labor Statistics

U.S. refiners have stepped up to the global need for petroleum fuels



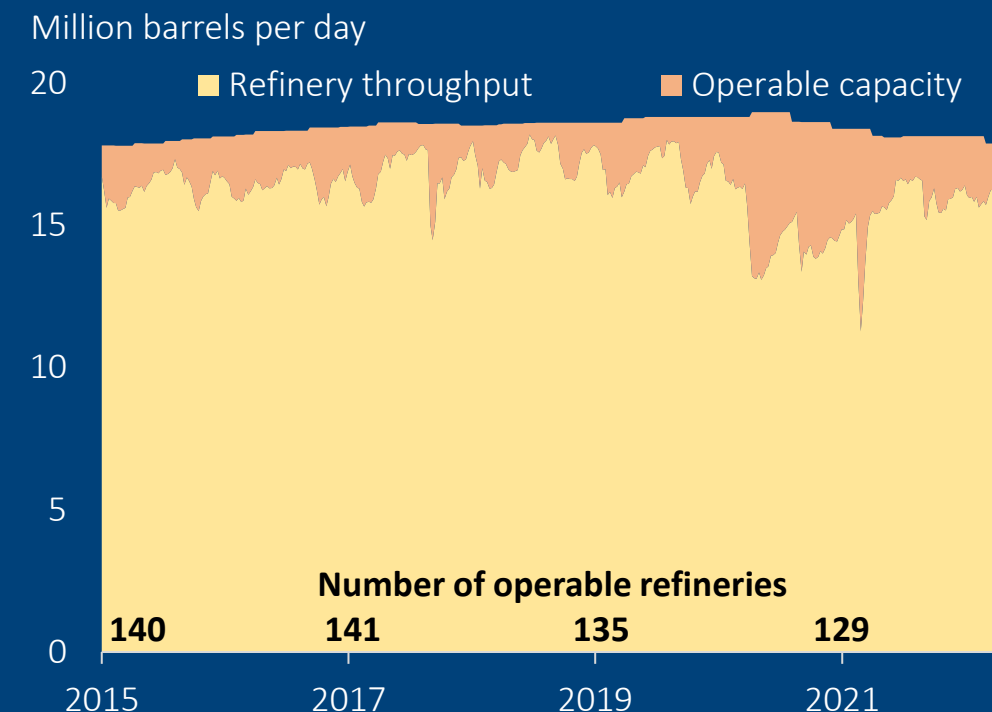
- The U.S. had returned to being a petroleum net importer in Jan. and Feb. 2022, but the global response to Russia's war on Ukraine increased the pull for U.S. petroleum net exports a record 1.4 mb/d in April 2022 per API
- U.S. refinery throughput has remained historically strong with relatively fewer refiners utilizing over 90% of their capacity in Q2 2022

U.S. crude oil production and net imports (exports)



sources: EIA, API MSR™

U.S. refinery capacity and throughput



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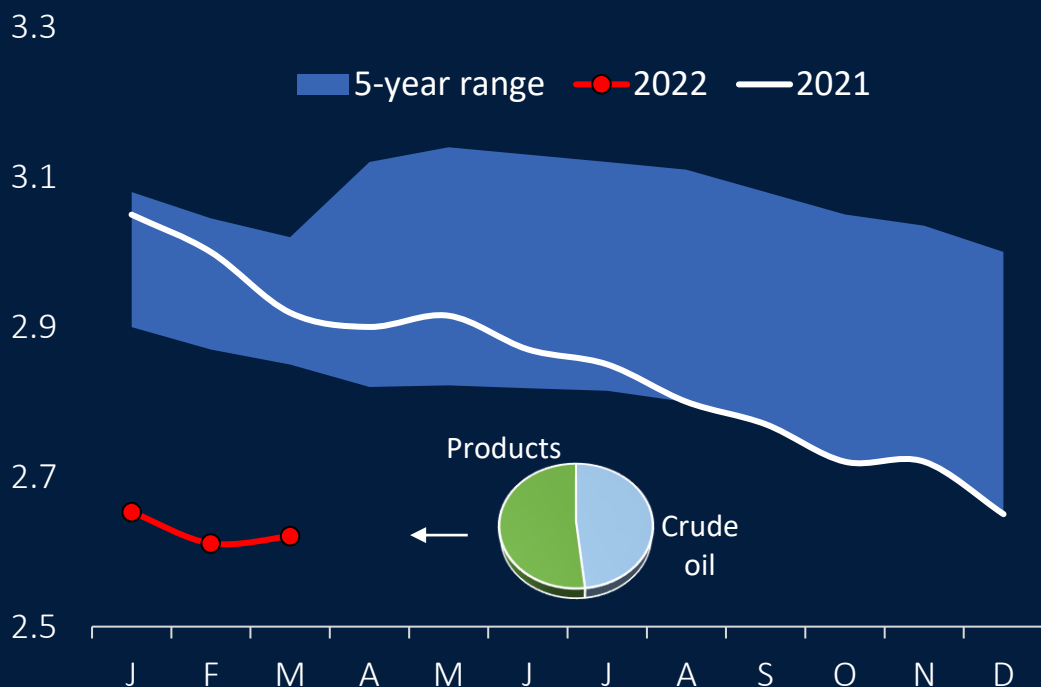
Historically low oil inventories persisted before Russia's war in Ukraine



- Global and U.S. commercial oil inventories decreased by about 10% y/y and remained below their 5-year ranges so far in 2022, before Russia's war in Ukraine escalated at the end of February
- Year-to-date through April, U.S. crude oil inventories fell by 3.4 million barrels – far below the historical average of more than 40 million barrels (2005 to 2021) – in advance of refining activity for the summer driving and winter fuels seasons

OECD commercial oil inventories (crude and products)

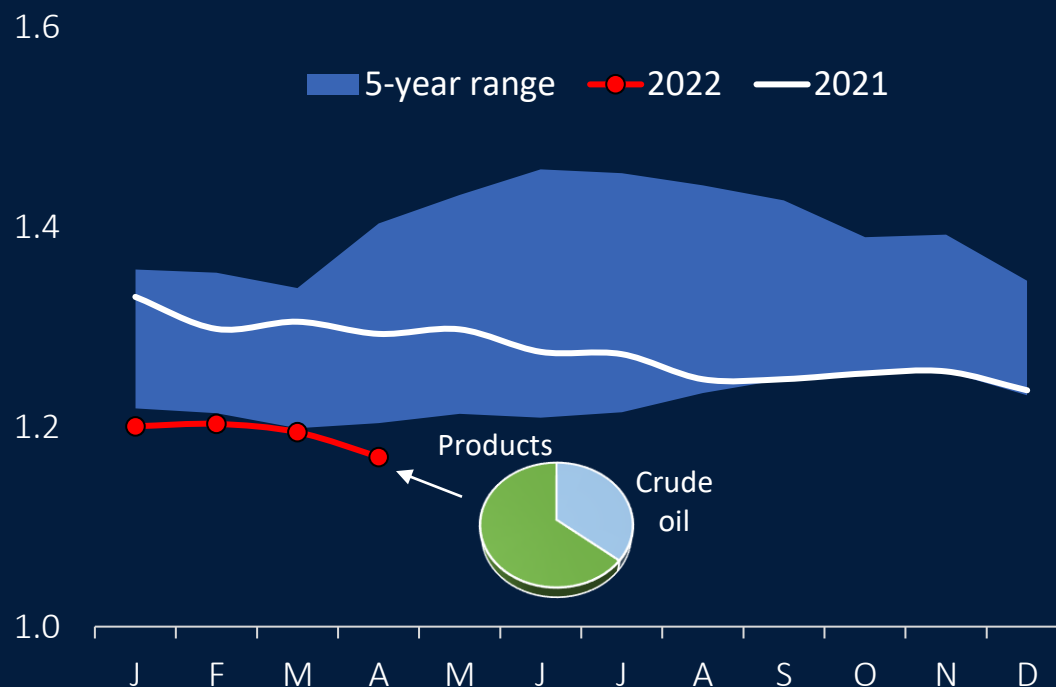
Billion barrels



sources: OPEC Argus; EIA; Euroilstock; IEA; METI

U.S. commercial oil inventories (crude and products)

Billion barrels



sources: EIA; API



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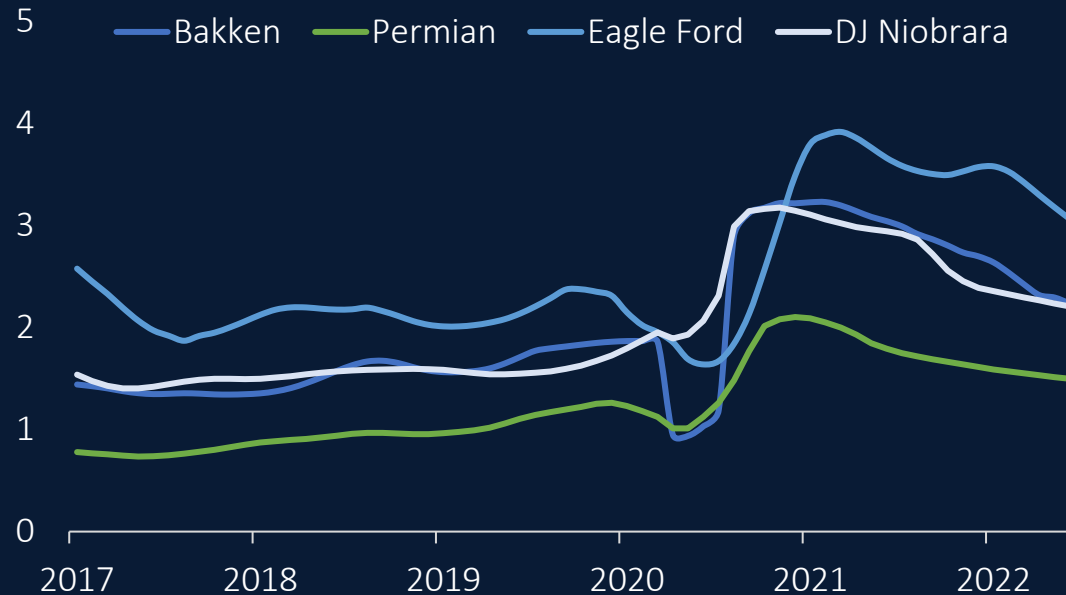
Oil and natural gas rig productivity has decreased by EIA estimates



- EIA estimated oil well productivity fell in the Permian (-18% y/y), Bakken (-25% y/y) and DJ Niobrara (-26% y/y) as of May 2022
- For dedicated dry gas drilling, rig productivity slipped 12% y/y in Q2 2022 as drilling activity expanded per EIA

U.S. oil well productivity – new production per rig

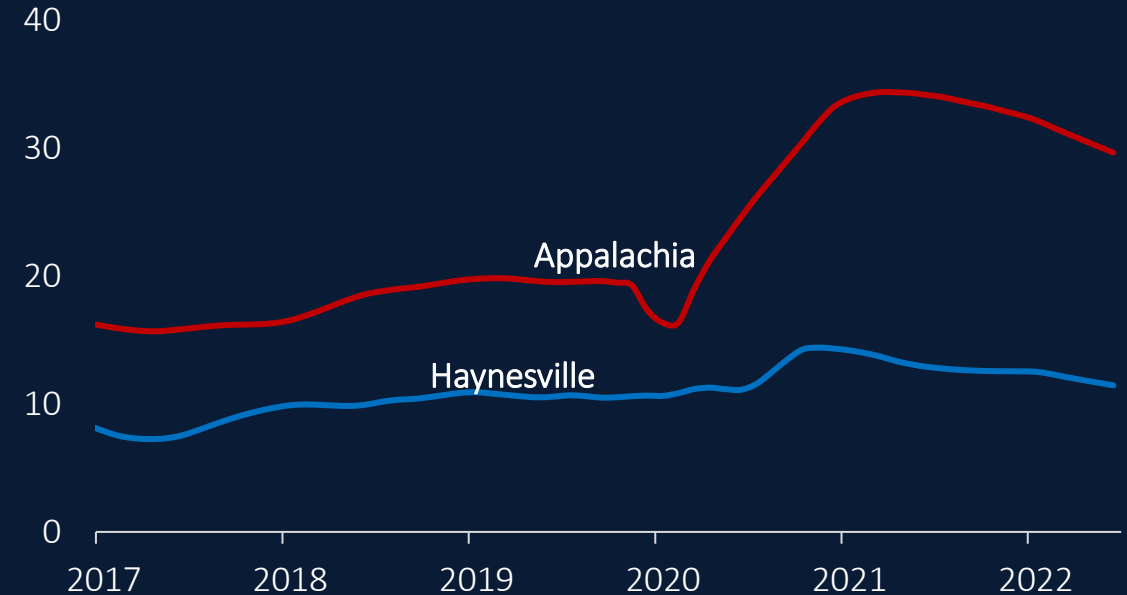
Thousand barrels per day oil-equivalent



source: EIA Drilling Productivity Report (May 2022)

Natural gas well productivity – production per rig

Million cubic feet per day nat. gas-equivalent



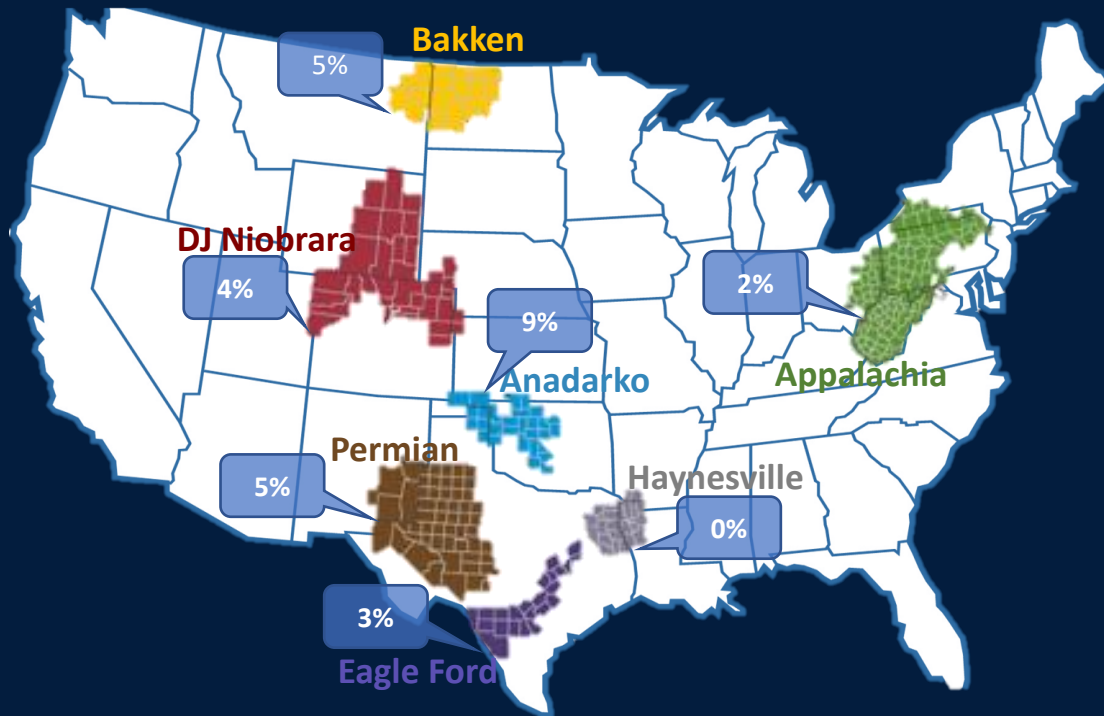
source: EIA Drilling Productivity Report (May 2022)

Drilled but uncompleted wells (DUCs) have contributed minimally to U.S. well completions so far in 2022



- ▶ In 2021, 30% of U.S. well completions were from wells that were previously drilled by uncompleted (EIA)
- ▶ As the DUC inventory has been drawn down, only 4% of U.S. well completions relied on DUCs in April 2022

U.S. oil and natural gas well completions from DUCs, by basin in April 2022



Drilled by uncompleted wells, by basin

Oil basins

Wells
6,000
4,000
2,000
0



Apr. 2021



Apr. 2022

Anadarko
Eagle Ford
Permian

Bakken
DJ Niobrara

Natural gas basins

Wells
1,500
1,000
500
0



Apr. 2021



Apr. 2022

Appalachia Haynesville

Despite elevated prices, U.S. liquid fuels consumption could reach record levels in 2023 per EIA



- High-frequency indicators of industrial activity remained solid through April, but transportation flattened along with slower economic activity and increased fuel prices
- EIA projects U.S. annual oil consumption growth of 3.8% (0.8 mb/d) y/y in 2022 and 1.0% y/y (0.2 mb/d) in 2023, which could tie the 2005 record

U.S. demand indicators, y/y%



Total Flights
May 2022 vs. May 2021

+19%



Plastics & Rubber
Apr. 2022 vs. Apr. 2021

+7%



Manufacturing
Apr. 2022 vs. Apr. 2021

+6%



Traffic Volume
Mar. 2022 vs. Mar. 2021

+3%



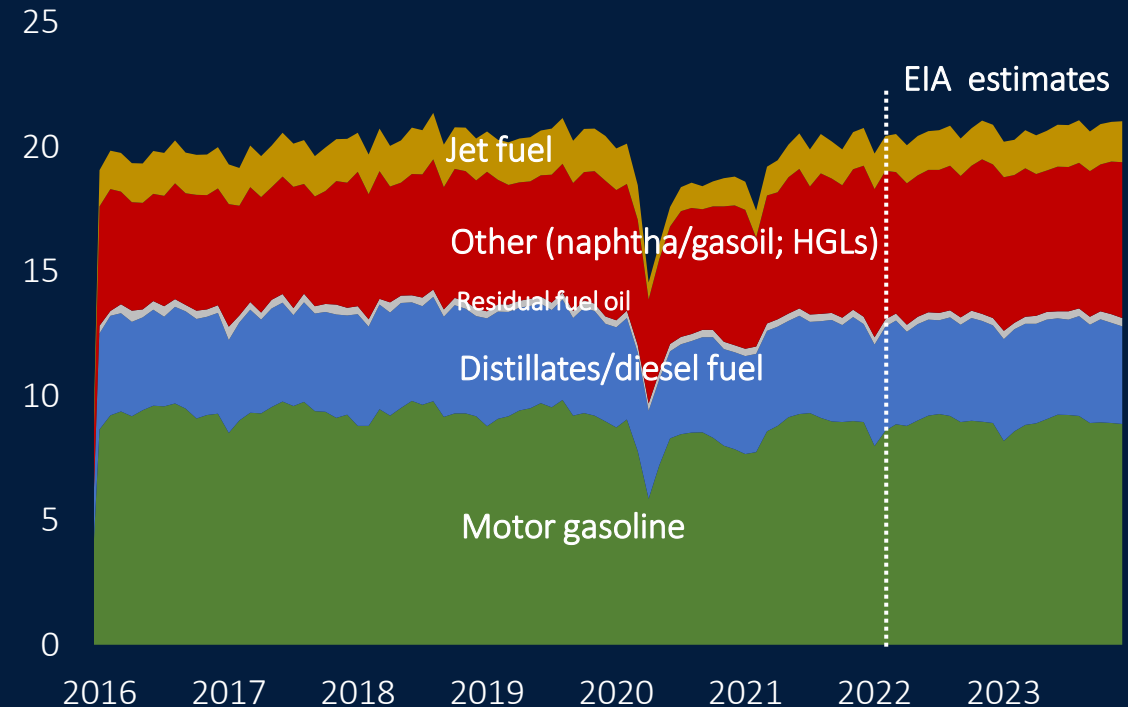
DAT Spot Truck Posts
May 2022 vs. May 2021

+17.7%

sources: FlightRadar24; FRB; FHA; DAT Trendlines

U.S. liquid fuel consumption by fuel

Million barrels per day



sources: EIA; API



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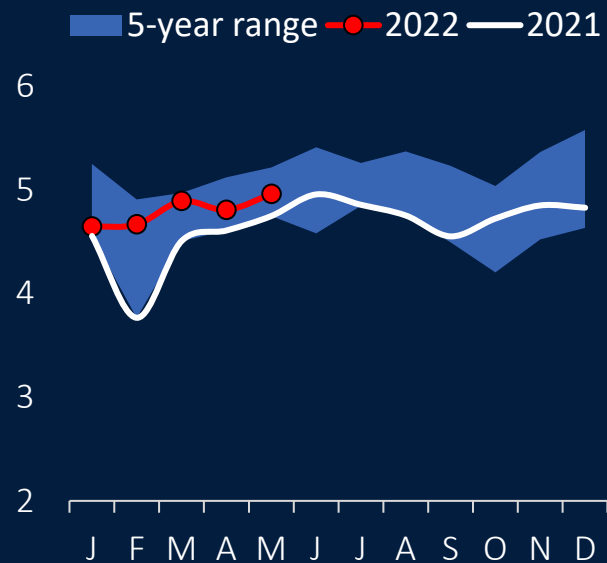
Distillates/diesel fuel fundamentals have generally tightened so far in 2022



- In the first five months of 2022, U.S. refinery distillates' production varied in its five-year range, while demand downshifted to the middle of it after exceeding the historical range to start the year
- Distillate exports doubled between January and April, and inventories remained below their five-year range

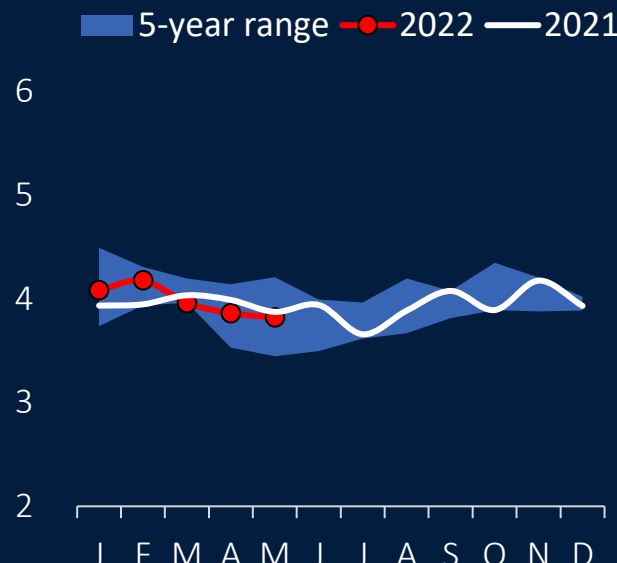
Distillates production

Million barrels per day



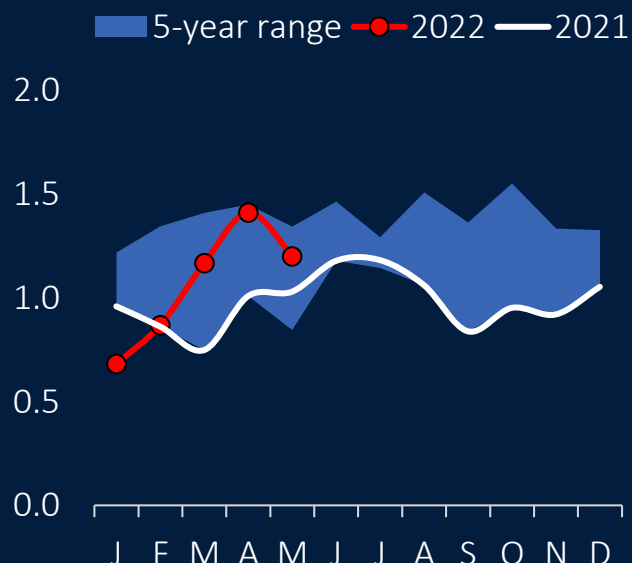
Distillates demand

Million barrels per day



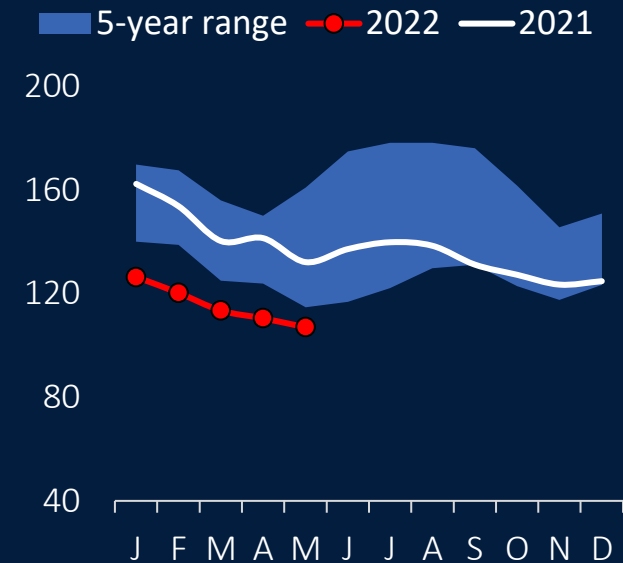
Distillates exports

Million barrels per day



Distillates inventories

Million barrels



sources: EIA; API MSR™

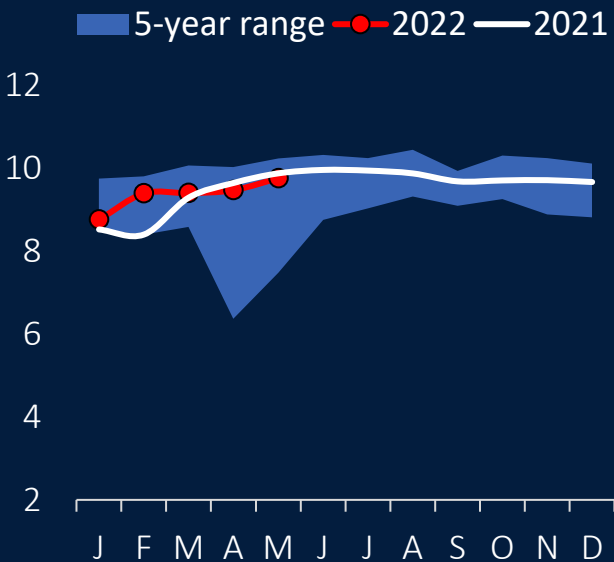
Motor gasoline fundamentals have similarly tightened so far in 2022



- In the first five months of 2022, U.S. refinery motor gasoline production remained strong within its five-year range, and motor gasoline demand flattened within the historical range
- Motor gasoline exports have nearly doubled since January, and inventories fell to the bottom of their five-year range

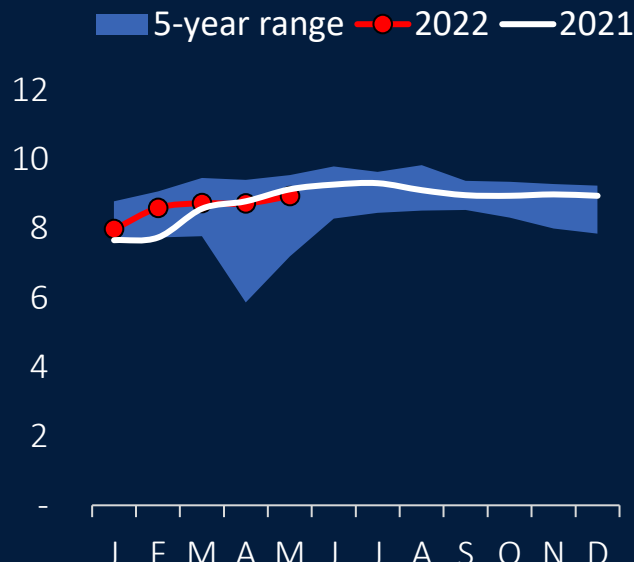
Motor gasoline production

Million barrels per day



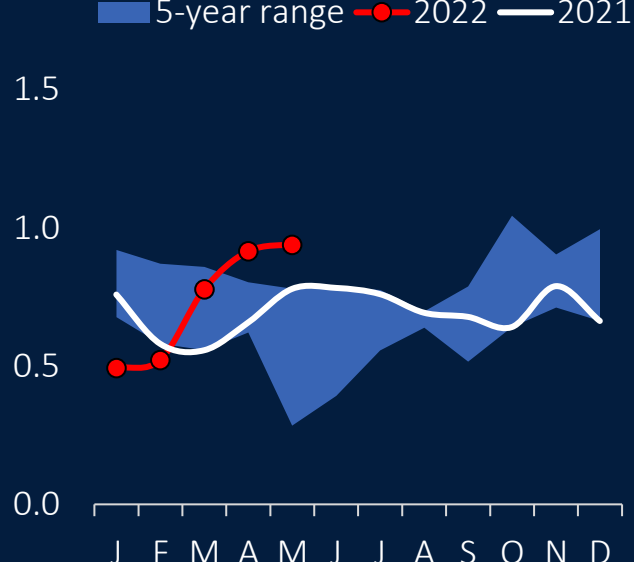
Motor gasoline demand

Million barrels per day



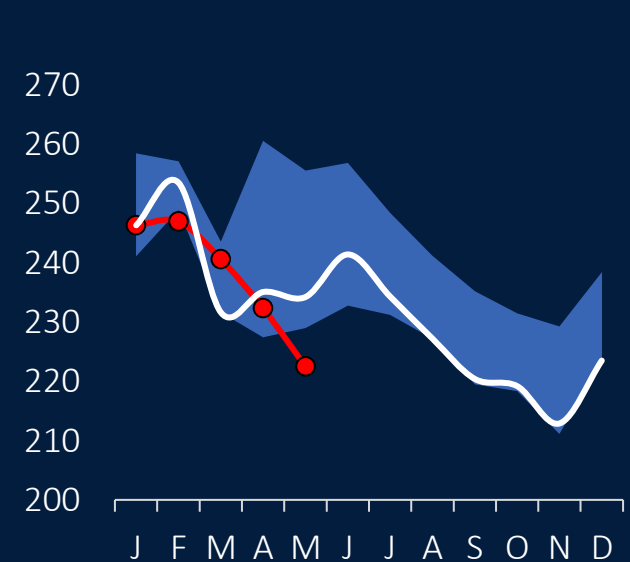
Motor gasoline exports

Million barrels per day



Motor gasoline inventories

Million barrels

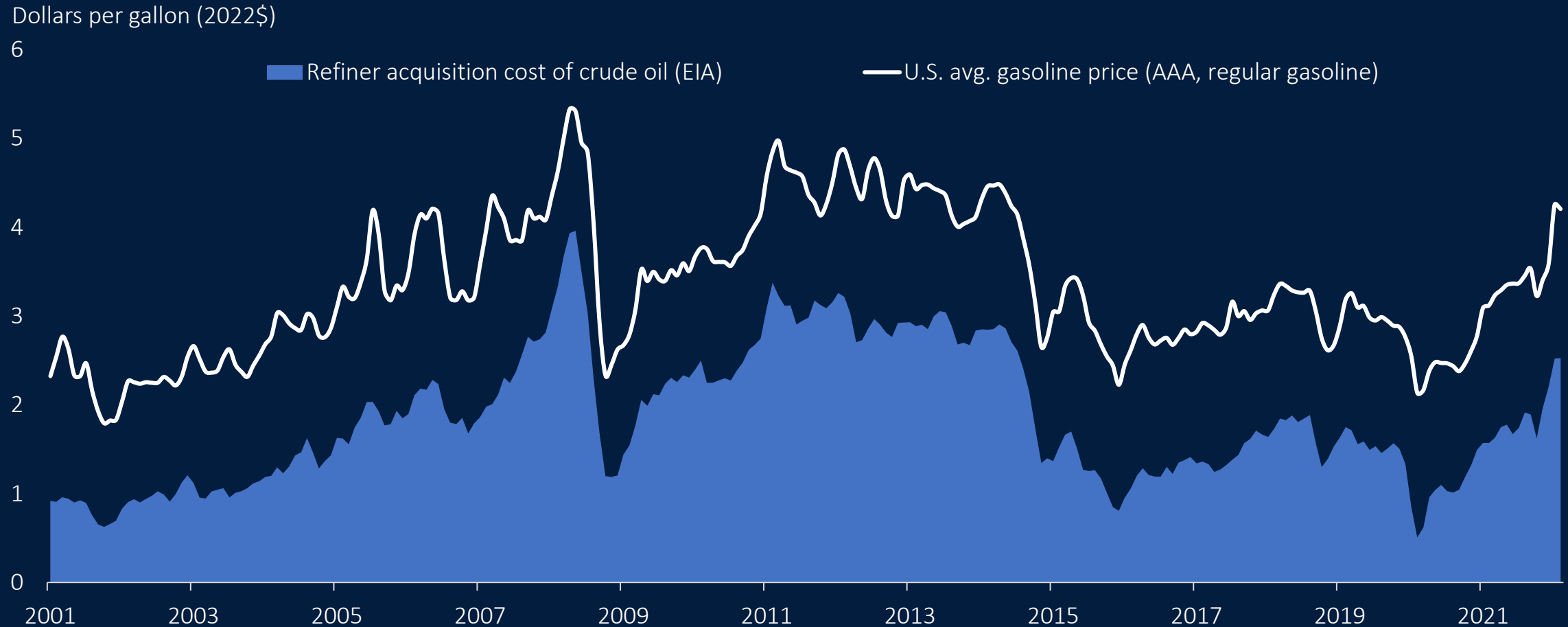


sources: EIA; API MSR™

Gasoline prices have historically reflected those of oil, which remained relatively low since 2015 but recently climbed to their highest levels since 2014



Refiner acquisition cost of crude oil prices versus U.S. average gasoline prices, adjusted for price inflation

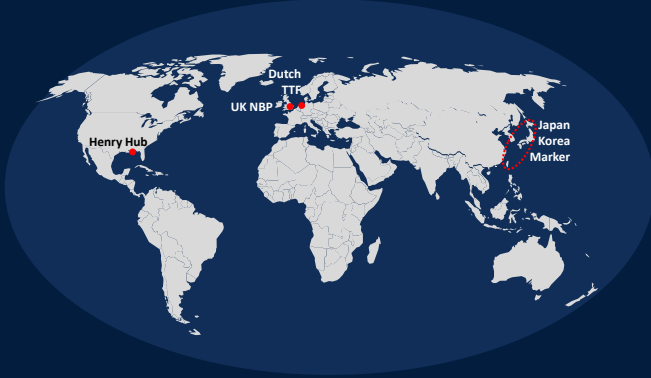


sources: Bloomberg; EIA; AAA; Bureau of Labor Statistics; API Team analysis

Natural Gas



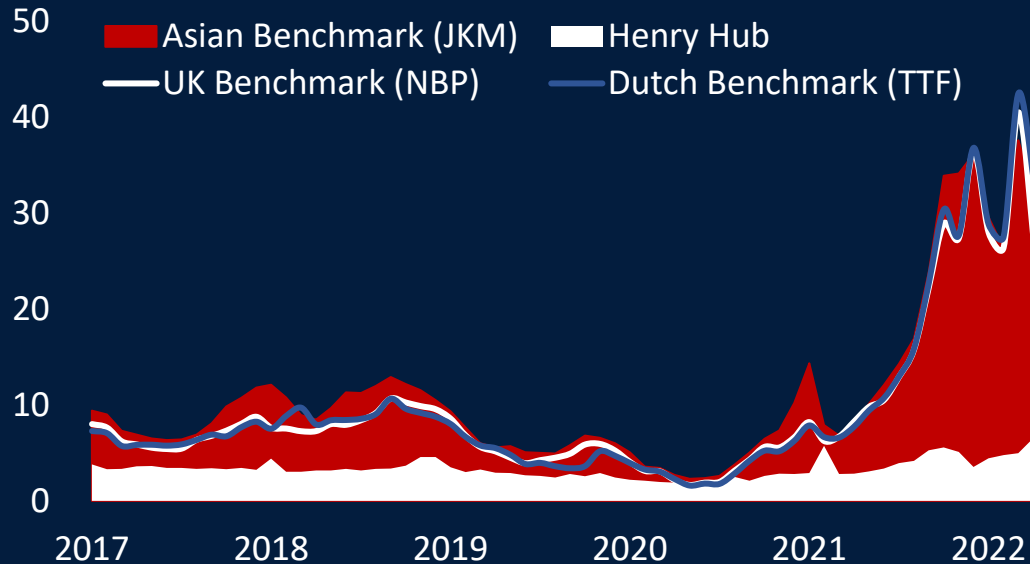
Historically strong global natural gas prices have spurred U.S. natural gas exports



As natural gas prices in Europe and Asia rose to unprecedented levels, U.S. natural gas exports via liquefied natural gas (LNG) and pipeline have achieved record levels

Global natural gas prices

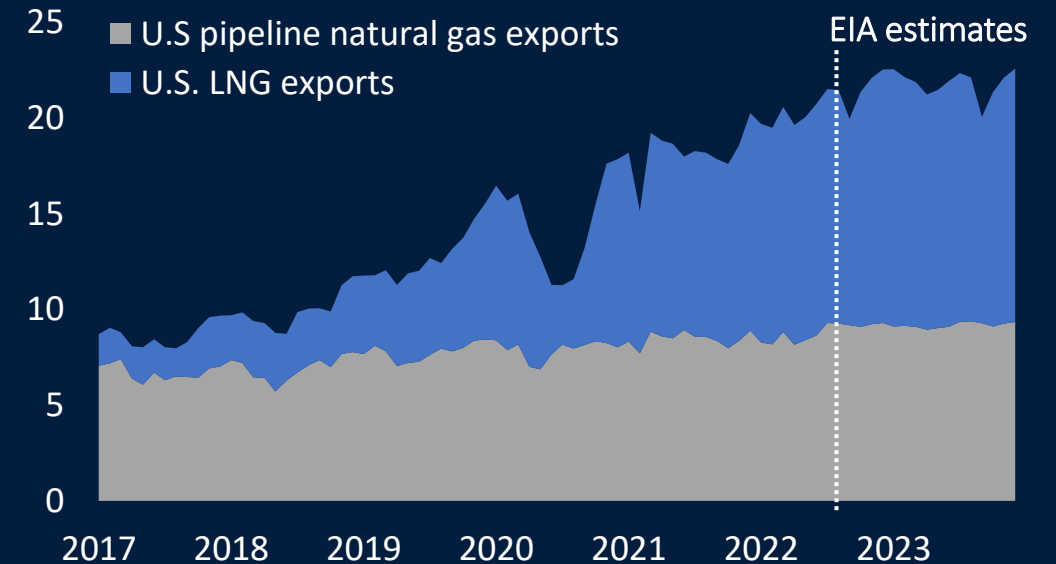
\$2022 per mmBtu, monthly



source: Bloomberg

U.S. natural gas exports

Billion cubic feet per day



source: EIA

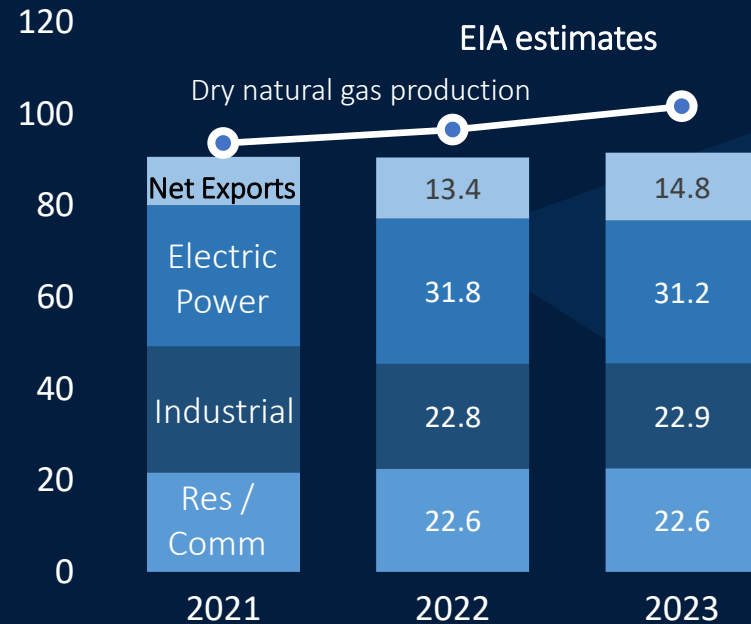
EIA expects natural gas production growth of 3.0 bcf/d in 2022 and 5.1 bcf/d in 2023 could support increased exports and more than 36% of U.S. electricity net generation



► EIA expects natural gas to represent more than 36% of U.S. net electricity generation despite increases by other sources

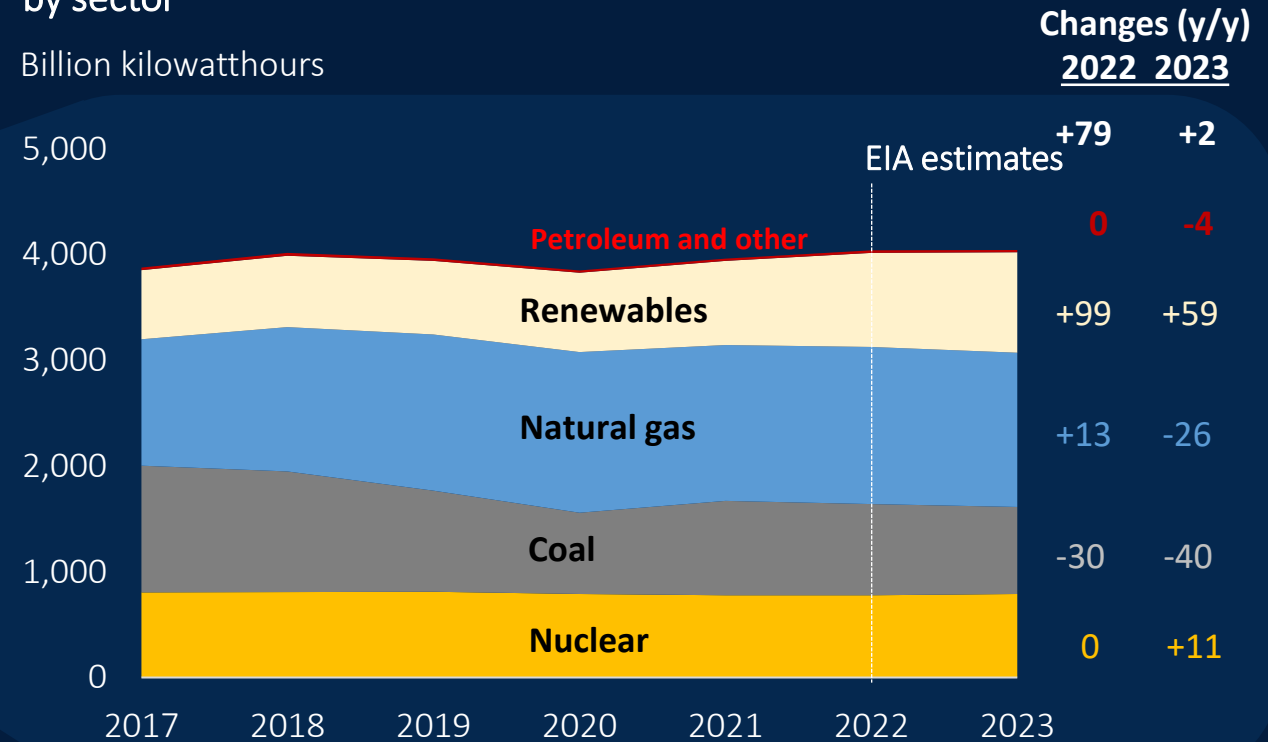
Natural gas consumption and production by sector

Billion cubic feet per day



Electricity net generation by sector

Billion kilowatthours



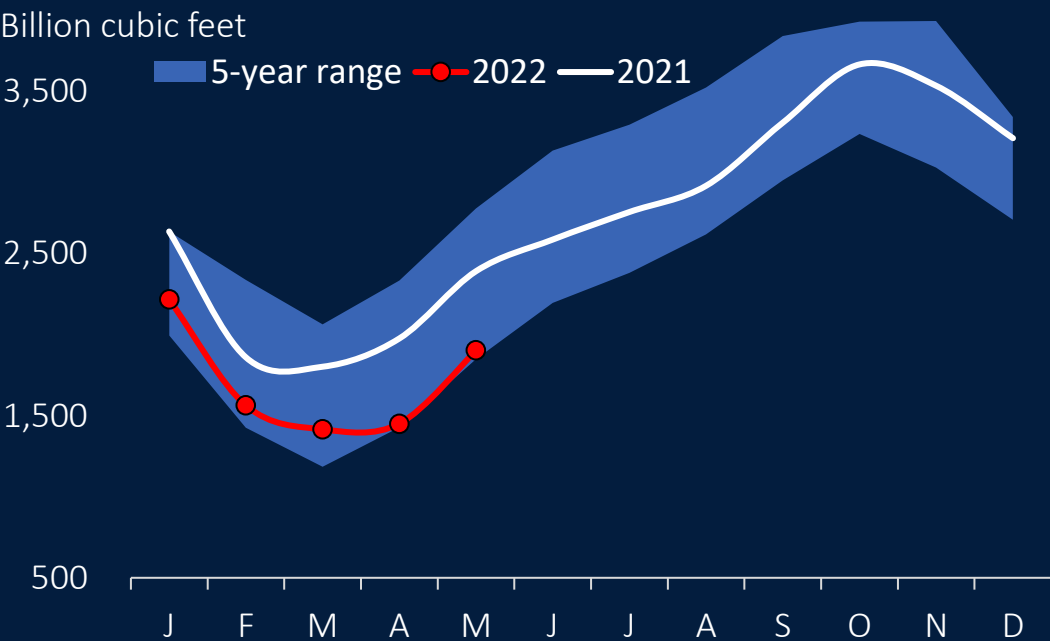
source: EIA (June 2022)



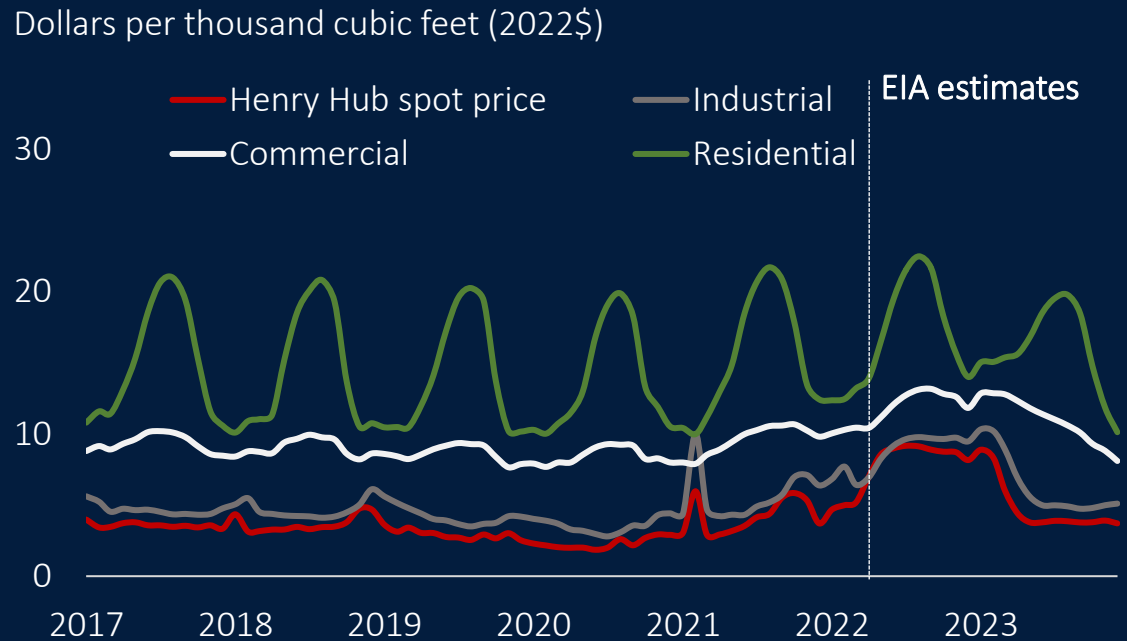
Historically low natural gas inventories have spurred higher prices that EIA expect could persist through the 2022-2023 winter

- Natural gas net injections into underground storage were 18% below those last year as of May 27 per EIA, resulting in storage at the bottom of its five-year range and recent price increases
- Natural gas prices through the value chain have risen so far through 2022, and EIA expects these changes to persist into 2023

U.S. working gas in underground storage



EIA natural gas prices by end-use sector



sources: EIA; EIA STEO (June 2022)

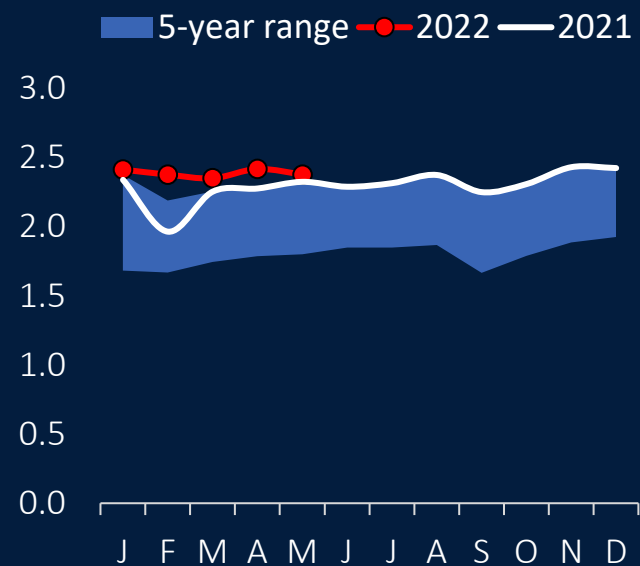
U.S. propane fuel supply has been historically strong, but propane demand and strong exports kept inventories towards the bottom of the 5-year range



- Though propane production has been steady above its 5-year range, historically strong demand to start the year and increased exports coincided with inventories near the bottom of their 5-year range through May 2022

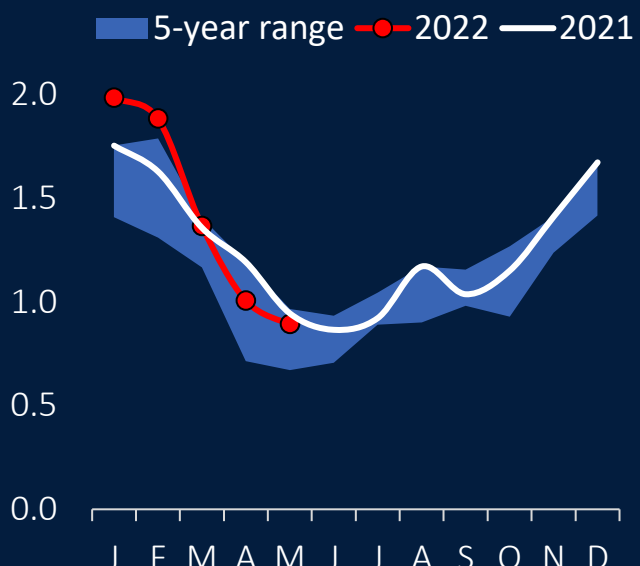
Propane production

Million barrels per day



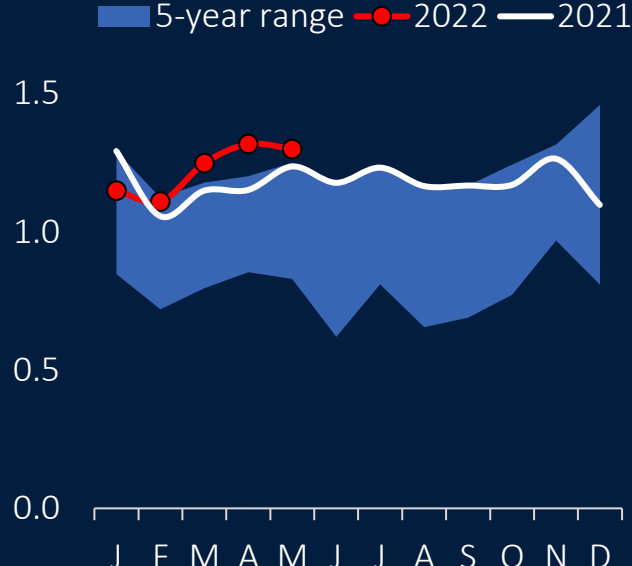
Propane demand

Million barrels per day



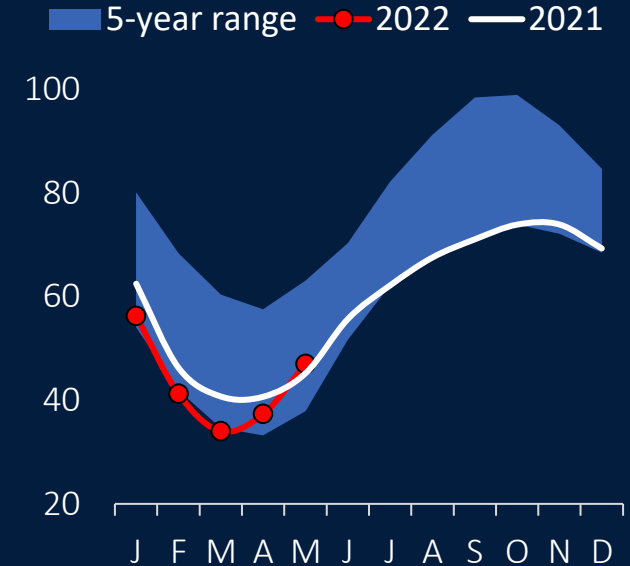
Propane exports

Million barrels per day



Propane inventories

Million barrels



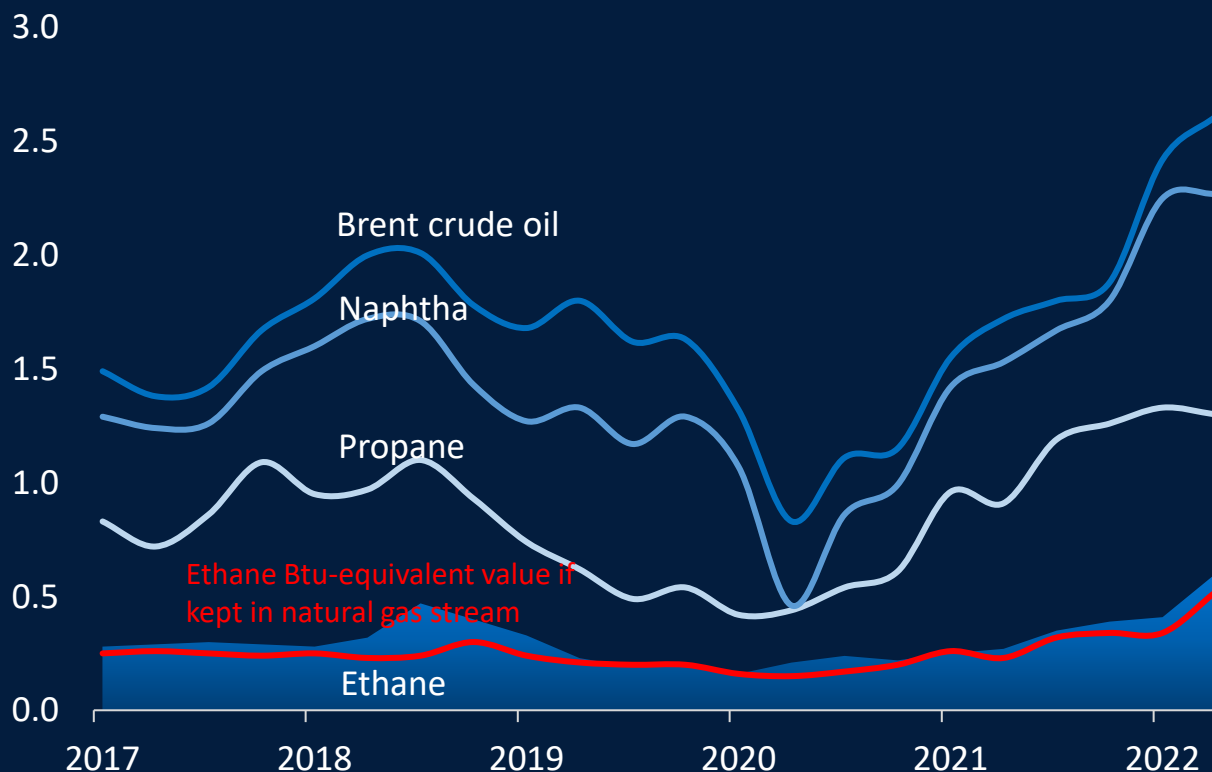
source: EIA

The relative prices of global petrochemical feedstocks – ethane, propane and naphtha – have shifted as a result of Russia's war in Ukraine



U.S. ethane, propane, naphtha vs. Brent crude oil prices

Dollars per gallon (2022\$)



sources: Bloomberg and API Team calculations

- Global naphtha and crude oil prices have historically moved together, while those of ethane and propane have depended on both global petrochemical prices and regional market conditions
- Ethane has been the largest growing component of natural gas liquids production, and prices for it exceeded \$0.60 per gallon in late May 2022 – up over 130% y/y to its highest since 2012
- Although the prices of ethane, propane and naphtha each rose, naphtha and ethane prices increases relative to propane in Q2 2022

API economics resources available at www.api.org

Data Visualization

Explore API's Interactive Data Visualizations.

Tracking U.S. Oil Demand
Primary monthly API data tracking refined product consumption
[Explore Visualization .nl](#)

U.S. Consumer Expenditure Summary
Summarizing leading U.S. consumer expenditure categories over time
[Explore Visualization .nl](#)

API's Distillate Economic Indicator™
API's proprietary Distillate Economic Indicator™ leverages refined product demand estimates to broadly track economic activity
[Explore Visualization .nl](#)

U.S. Consumer Expenditure Flows By Income Level
Mapping U.S. consumer expenditure flows by income level and spending category
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U.S. Consumer Expenditure Burden By Income Level
Measuring U.S. consumer expenditure burden by spending category and income level
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API's Economic Industry Outlook

The API Industry Outlook, developed by API's Dean Foreman, is a quarterly report that provides natural gas and oil industry as it relates to the economies.

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