

**R. Dean Foreman, Ph.D.**

**December 16, 2024**



# Key Points

## Global, U.S., and Texas Economies

- Global GDP projected to grow 2.8% annually (2025-2026); Emerging Markets adjusted down for 2025, up for 2026
- A strong U.S. dollar has historically pressured oil prices and inflation; BRICS currency discussions remain speculative
- Rising auto loan and credit card delinquencies could limit credit access, affecting U.S. growth (70% of GDP driven by consumer spending)
- Texas' significant trade deficit with Mexico underscores high stakes in tariff discussions

## Global Oil Market

- Global oil demand to reach 104.3 mb/d in 2025 (+1.3 mb/d, EIA)
- U.S. leads 2025 supply growth, plus an additional +1.1 mb/d of new supply to from other non-OPEC nations
- Speculative momentum has continued to influence oil prices since 2023

## Natural Gas Markets

- U.S. natural gas production hits record highs, driven by Texas and the Permian Basin
- Storage remains high despite robust exports and consumption, aligning near-term prices with historical averages

## Texas Oil & Gas Industry

- Shale production has risen despite utilization of fewer rigs, enabled by productivity gains
- Industry employment up 2.7% y/y; wages rose 6.7% y/y in Q2 2024, totaling 499,444 jobs and \$14.3 billion in wages

## Key Uncertainties

- Geopolitical tensions and global trade policies
- Potential tariff (and retaliation) impacts on inflation, monetary policy, and sovereign debt

## Global, U.S., and Texas Economies

- [Global GDP growth: The base case is for a steady outlook to 2026](#)
- [A strong U.S. dollar has historically exerted downward pressure on oil prices](#)
- [U.S. consumers' debt burden shows the financial strain on U.S. households](#)
- [Business conditions have remained conducive to U.S. GDP growth](#)
- [Texas is a net importer of goods and runs a large trade deficit with Mexico, so consumers and businesses have much at stake with potential tariffs](#)

## Oil Markets

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- [Led by U.S. production, the global oil market's balance appears well positioned to continue to provide for global energy needs](#)
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## Natural Gas Markets

- [Global natural gas demand could reach new record highs in 2025 and 2026](#)
- [U.S. natural gas production leads the world](#)
- [U.S. natural gas marketed production is at a record 113 bcf/d in 2024—and poised to grow further in 2025](#)
- [U.S. natural gas storage has exceeded its historical range despite strong consumption and exports](#)
- [Texas' natural gas flows in September 2024: Historically strong production supported increased exports and domestic production](#)
- [Near-term natural gas futures prices vary in line with their historical mean reversion target](#)

## Productivity, Jobs, and Wages

- [Led by the Permian Basin, Texas' shale oil and tight gas production has risen despite the utilization of fewer rigs](#)
- [Rig productivity gains have continued to enable production growth](#)
- [Texas' oil and natural gas industry employment rose to 499,444 in Q2 2024](#)

# Global, U.S. and Texas Economies

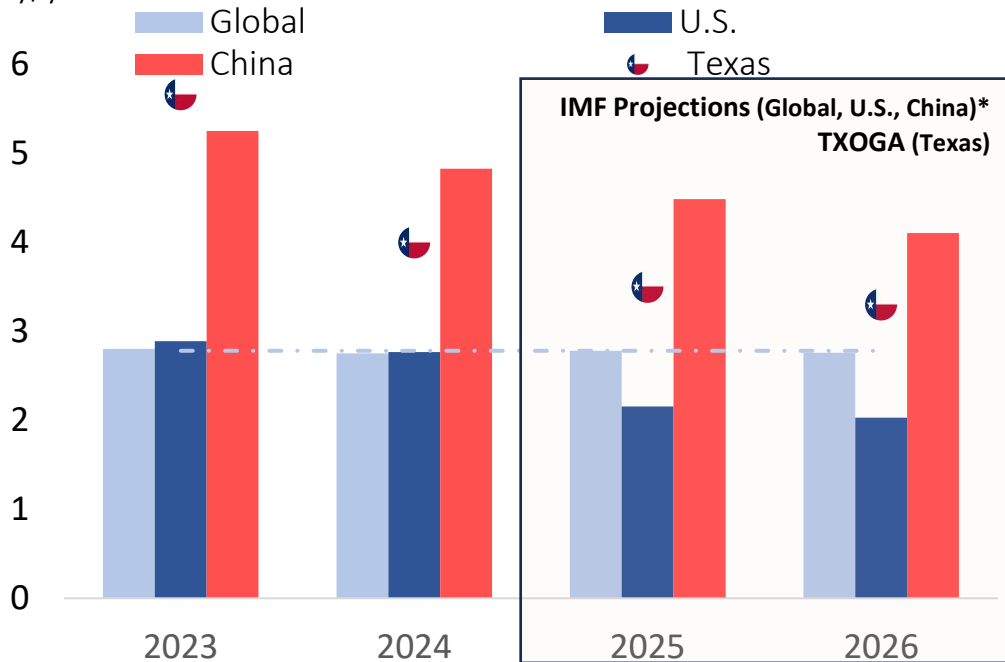


# Global GDP growth: The base case is for a steady outlook to 2026

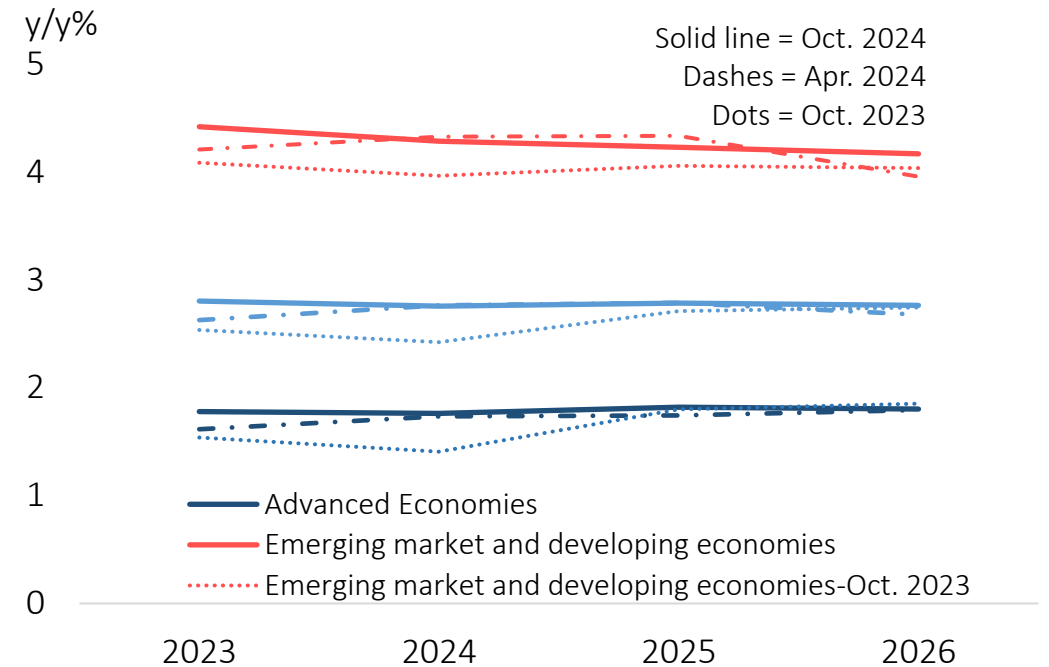


- Global GDP growth projections by the International Monetary Fund\* (IMF) remained steady in Q4 2024 at 2.8% annually for 2024, 2025, and 2026, aligning with long-term averages
- Regional trends vary, with upgrades for the U.S. and Emerging Markets overall, but downgrades for China and Europe
- Texas' growth has moderated from 5.7% year-over-year in 2023 to 4.3% in the first half of 2024, consistent with TXOGA's projections of 4.0% growth in 2024, 3.5% in 2025, and 3.3% in 2026

## Real GDP growth\* y/y%



## Economic outlook changes

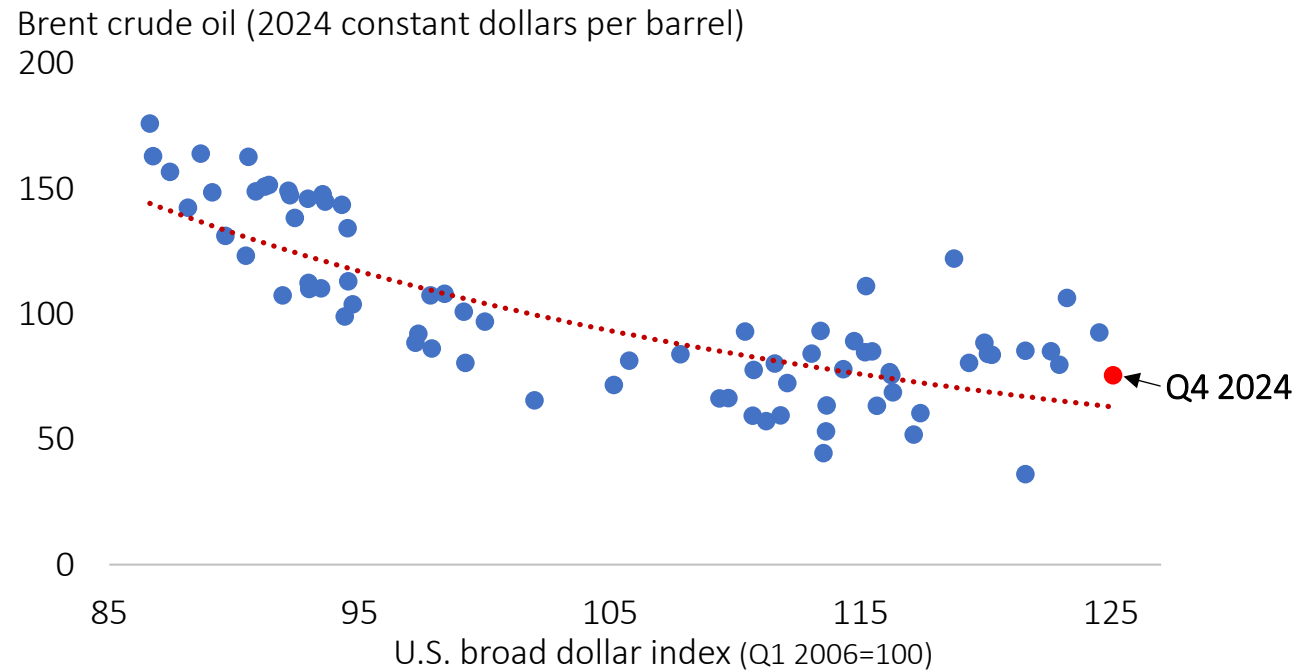


# A strong U.S. dollar has historically exerted downward pressure on oil prices

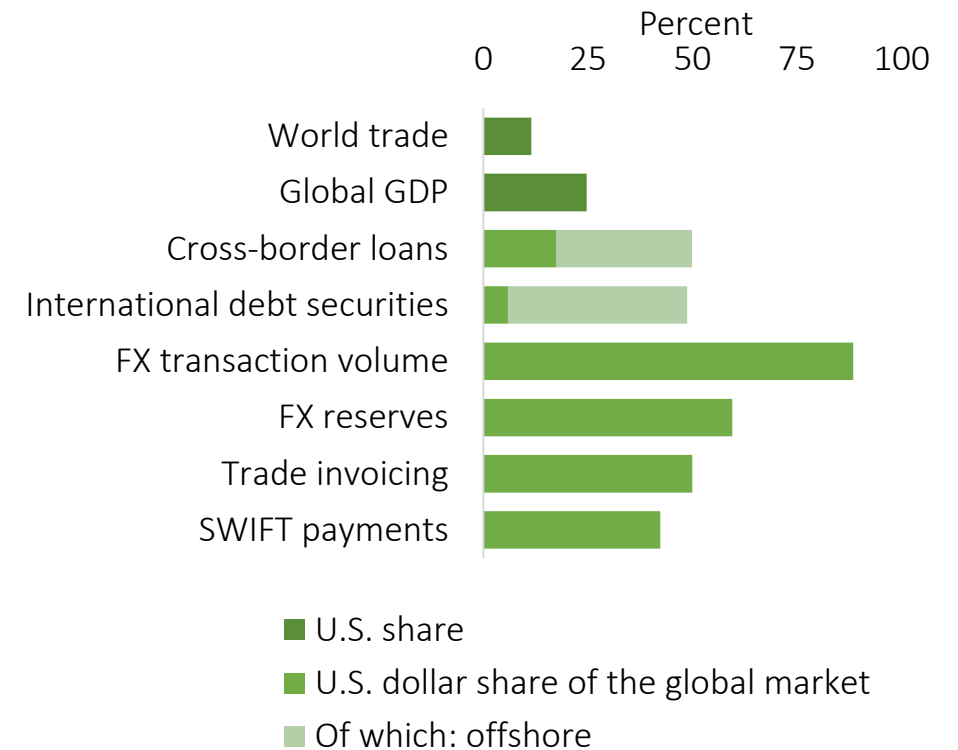


- In Q4 2024, the U.S. dollar has risen to its strongest exchange rate, as trading partners reduce interest rates alongside the U.S.
- While many factors affect global oil prices, the dollar's strength has historically shown an inverse correlation with oil prices due to its role in pricing oil, commodity trading dynamics, terms of trade, and the indirect effects of monetary policy
- Despite discussions of a potential BRICS currency and related U.S. tariffs, the dollar retains its strength due to its integral role in the global economy as well as the confidence and safety it provides

## U.S. broad dollar index and Brent crude oil prices, Q1 2006-Q4 2024



## The U.S. dollar's international role



# U.S. consumers' debt burden shows the financial strain on U.S. households

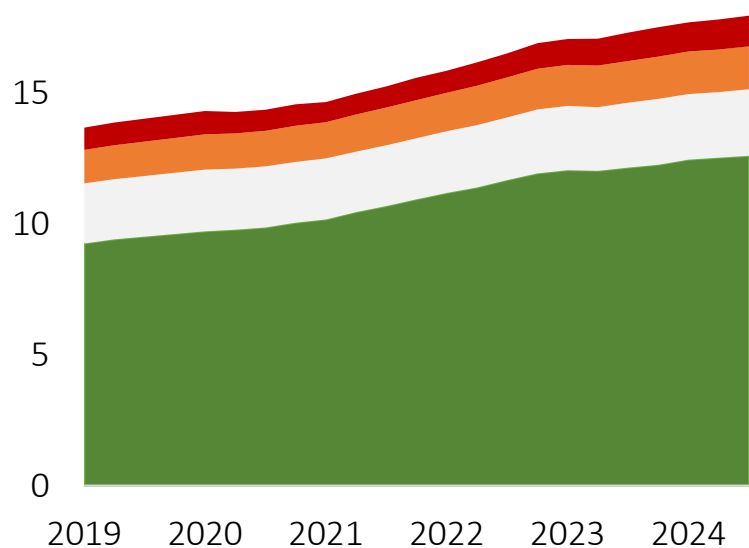


- U.S. household debt hit a record \$17.94 trillion in Q3 2024, according to the New York Federal Reserve Bank
- Credit delinquencies rose to their highest level since Q2 2020, with new auto loan and credit card delinquencies of 90+ days remaining historically high
- Rising delinquencies, especially in auto loans and credit cards, could constrain access to credit and dampen economic growth, given that consumer spending accounts for about 70% of U.S. GDP

## U.S. consumer debt

Trillion dollars

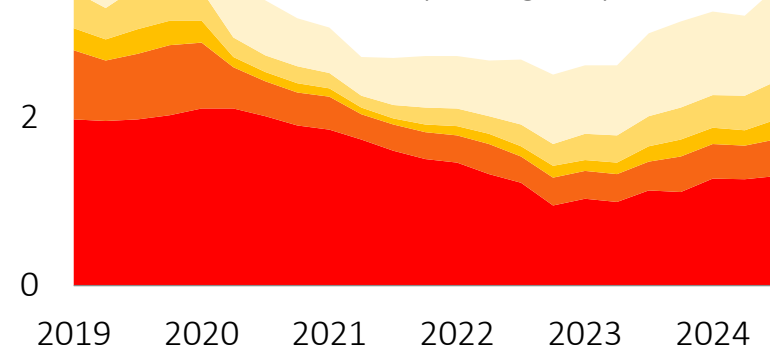
20 ■ Mortgage ■ All other\* ■ Auto ■ Credit card



## Total balance by delinquency status

Percent of balance

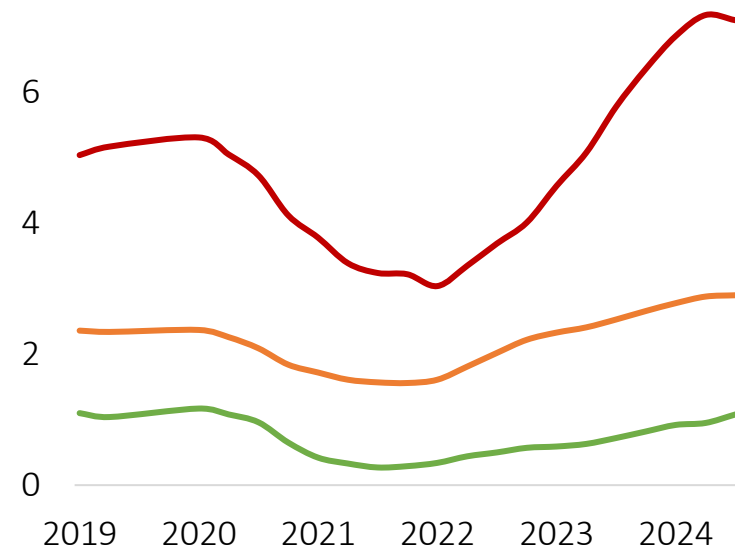
6  
■ 30 days late  
■ 60 days late  
■ 90 days late  
■ 120+ days late  
■ Severely Derogatory



## New seriously delinquent balances by type\*\*

Percent of balance

8 — Mortgage — Auto — Credit card



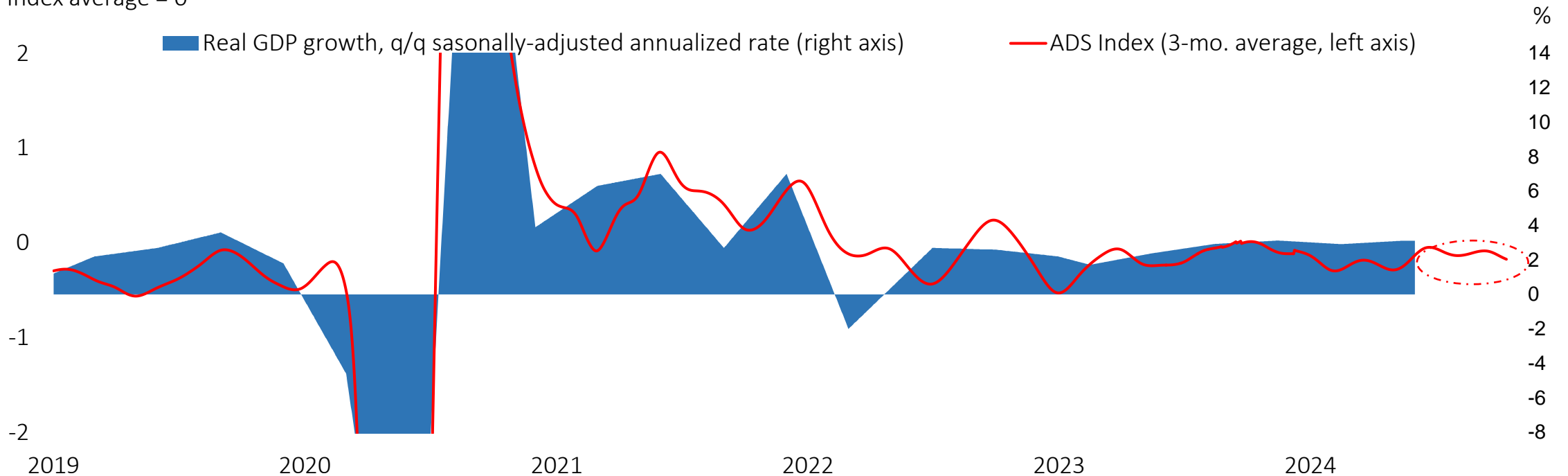
# Business conditions have remained conducive to U.S. GDP growth



- The ADS index, published by the Philadelphia Federal Reserve, provides timely insights into current and near-term economic conditions, helping businesses and policymakers anticipate shifts in growth and adjust strategies accordingly
- Its 3-month rolling average has reliably led historical GDP growth trends - and indicates continued economic expansion in Q4 2024 with positive momentum heading into 2025

## Aruoba-Diebold-Scotti business conditions index and U.S. real GDP growth

Index average = 0



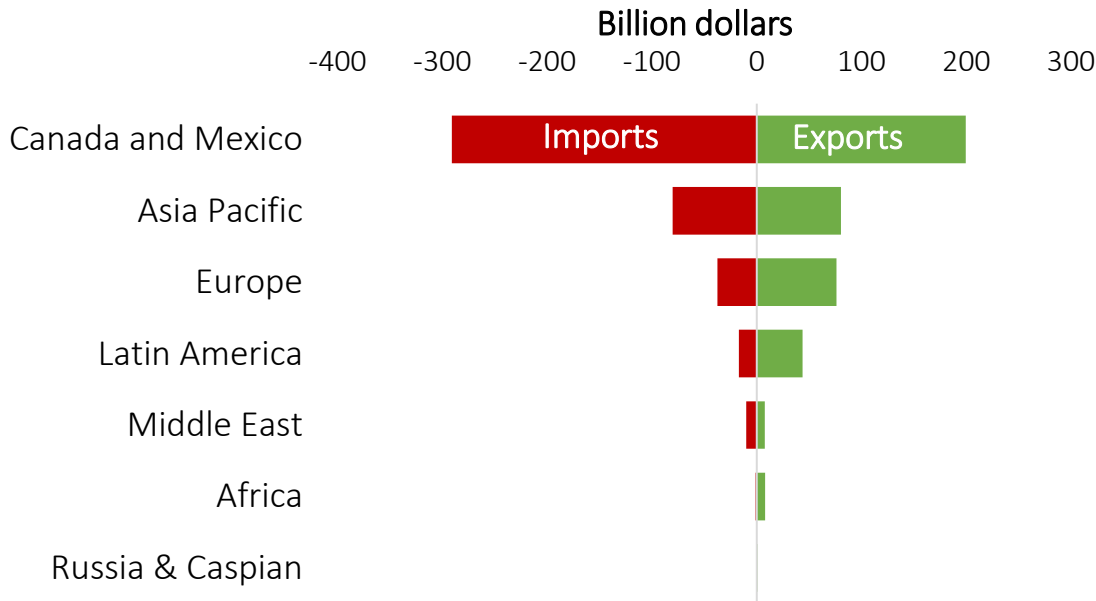


# Texas is a net importer of goods and runs a large trade deficit with Mexico, so consumers and businesses have much at stake with potential tariffs

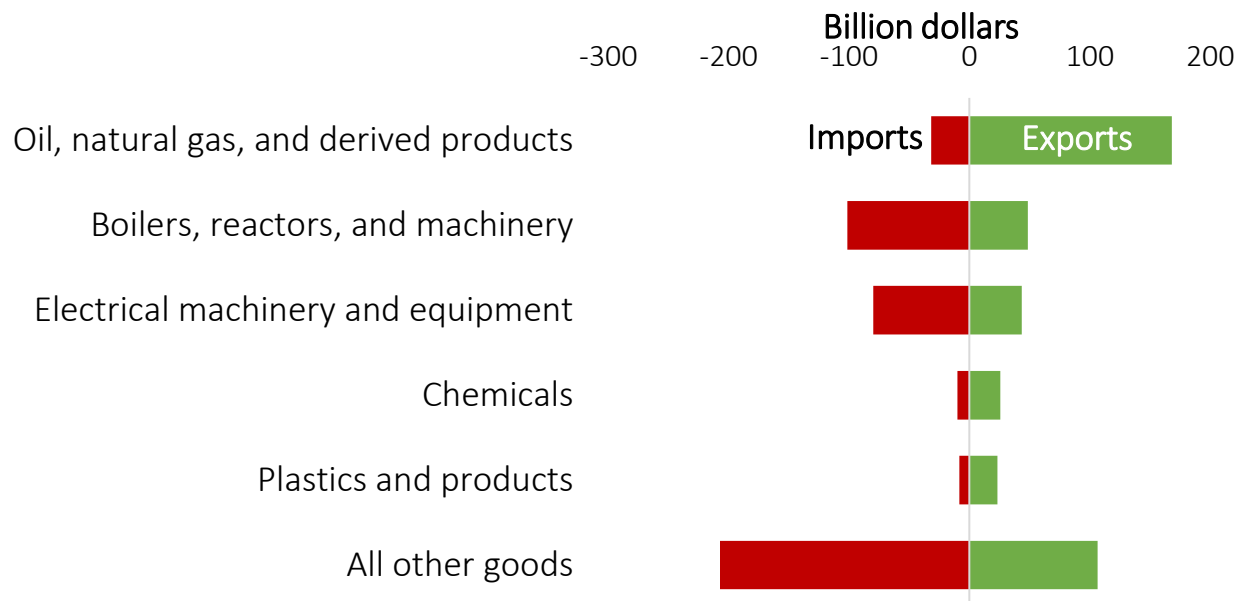


- ▶ Texas had an overall trade deficit of **\$22 billion** for goods in the first three quarters of 2024, despite exporting **\$172.0 billion** of energy products, plastics, and chemicals over the period
- ▶ Year-to-date through September, Texas ran trade surpluses with Europe (\$38.6 billion), Latin America (\$26.4 billion), and Africa (\$6.7 billion); balanced trade with Asia Pacific and the Russia & Caspian region; and deficits with Mexico (**\$87.9 billion**), Canada (\$3.3 billion), and the Middle East (\$2.4 billion)
- ▶ Texas' trade deficit with Mexico was driven by imports of motor vehicles (**\$52.6 billion**), machinery (**\$38.2 billion**), and electrical equipment (**\$15.3 billion**), offset partially by exports of energy, plastics, and chemicals

Texas international trade by region, year-to-date through September 2024



Texas international trade by product, year-to-date through September 2024



# Oil Markets



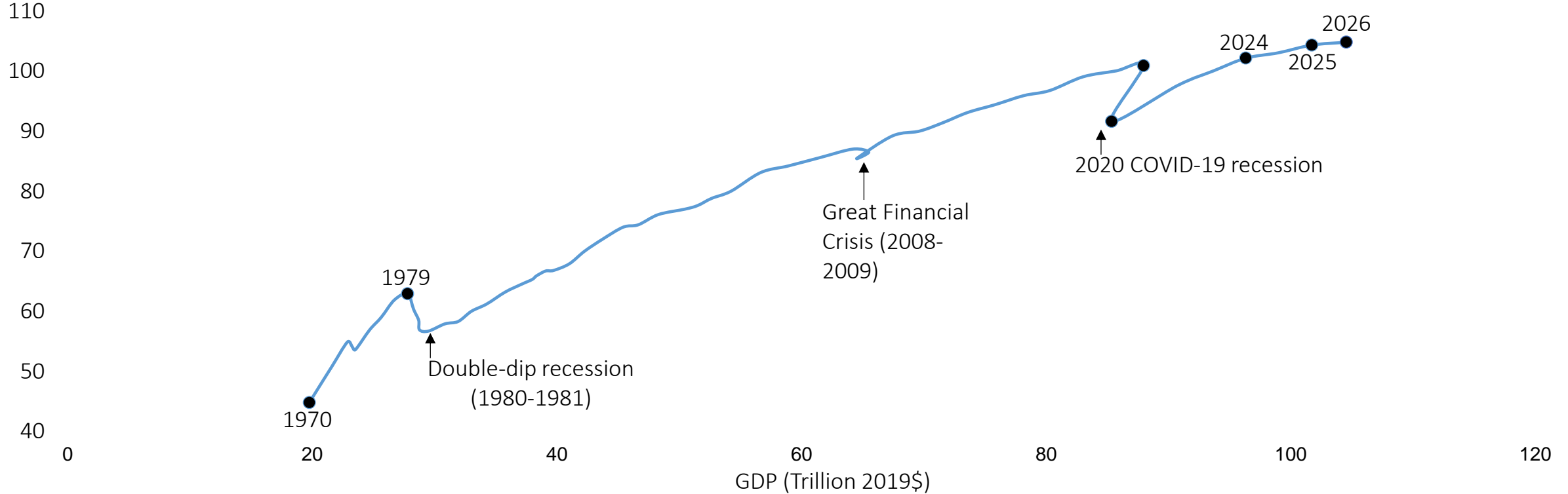
# Global oil demand reached a record high in 2024 along with the economy -- and could exceed 104 mb/d in 2025



- ▶ Global oil demand could grow to a 3<sup>rd</sup> consecutive record high, from 103.0 mb/d in 2024 to 104.3 mb/d in 2025 and 104.9 mb/d in 2026 per EIA

## Global oil demand and GDP\*

Million barrels per day (mb/d)



# Led by U.S. production, the global oil market's balance appears well positioned to continue to provide for global energy needs



## Global oil headlines



**What a Trump presidency means for oil and gas markets**

Think.ING, November 8, 2024

**Oil Was Written Off. Now It's the Most Productive US Industry**

Bloomberg, October 31, 2024

**Saudi Arabia Regains Some Oil Market Share From Russia in Asia**

OilPrice.com, December 2, 2024

**OPEC and IEA diverge widely on oil demand projections through 2050**

Middle East Economy, November 12, 2024

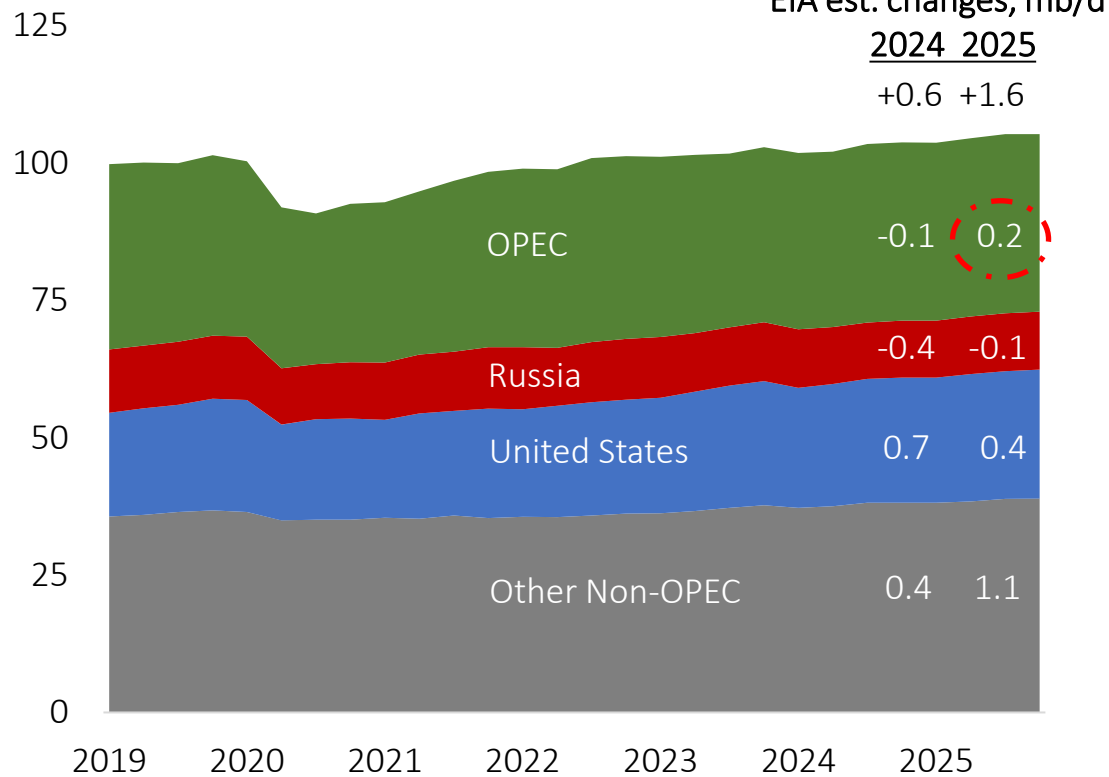
# Global oil production and market balance projections to 2025: Potential over-supply later in 2025 could hinge on OPEC



- ▶ EIA projects 2025 global supply increases of 1.6 mb/d, led by the U.S. and other non-OPEC producers, coupled with increased OPEC output
- ▶ Global oil inventory withdrawals continue per EIA, including 0.7 mb/d in Q1 2025, corresponding with Brent crude oil prices of \$74 on average in 2025, compared with \$73 per barrel currently
- ▶ OPEC's projected 2025 supply growth is a wildcard that could cause global supply growth (1.6 mb/d) to exceed that of demand (1.3 mb/d)

## Oil production by country/region

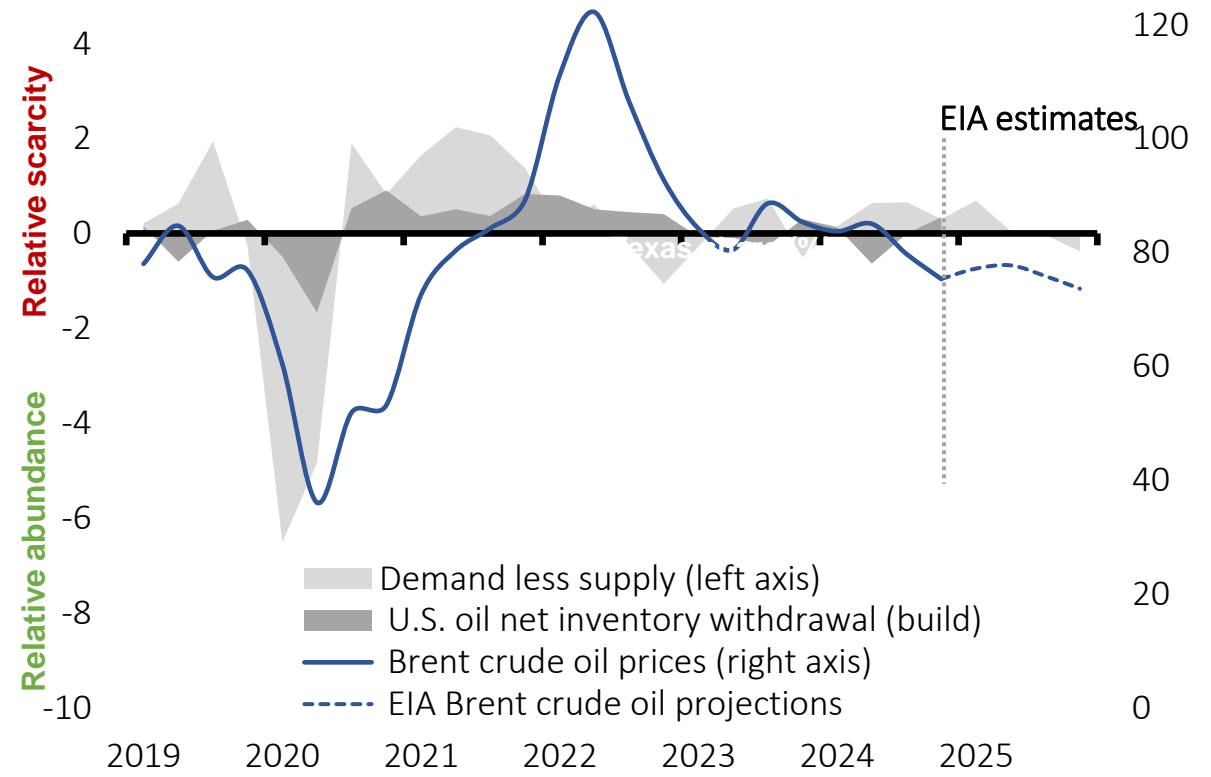
Million barrels per day, mb/d



## Global market balance & Brent prices

Million barrels per day (mb/d)

2024\$/Bbl



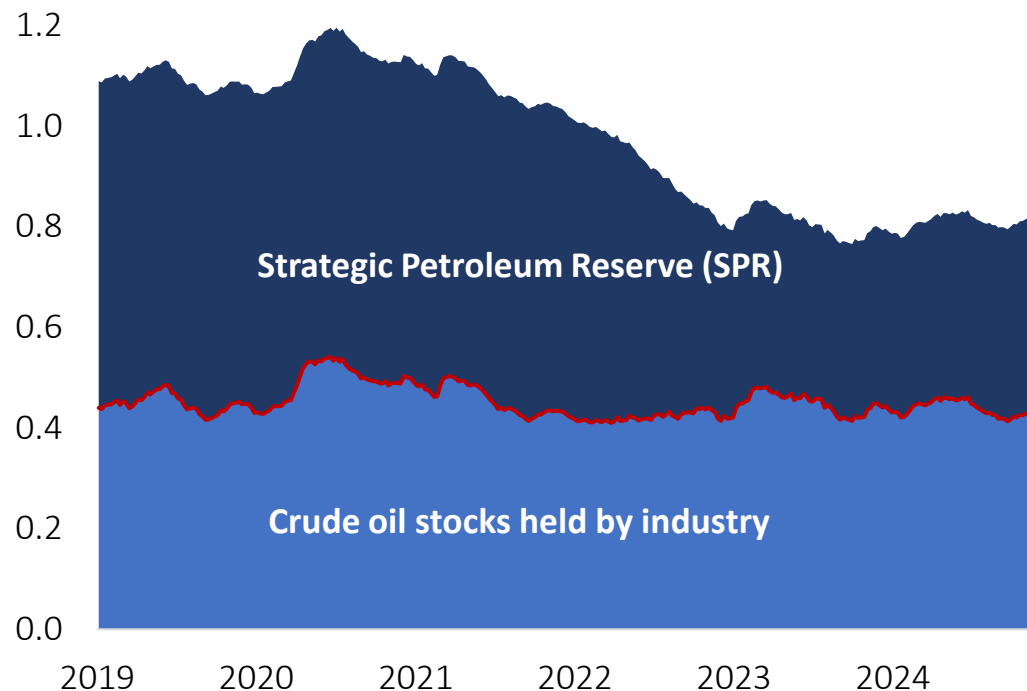
# U.S. crude oil inventories have remained at historic lows



- ▶ Despite increasing Strategic Petroleum Reserves by 36.0 million barrels (10.2%) year-to-date through November 22, U.S. crude oil inventories remain in the bottom 10% in data on record since 1982
- ▶ Crude oil stocks held by industry have also stayed at the bottom of the 5-year range, with only seasonal increases

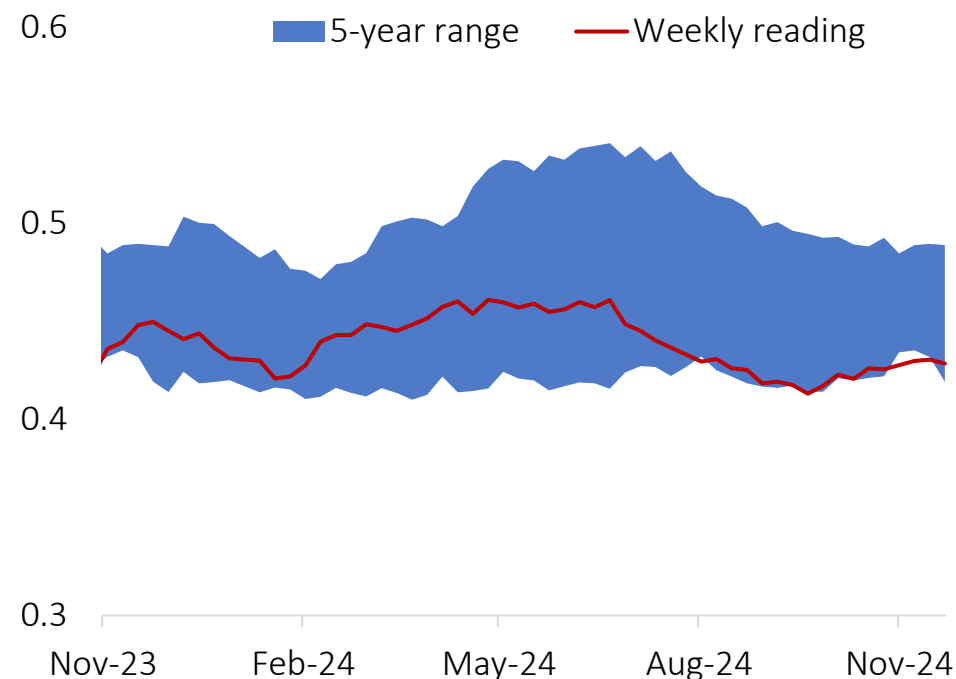
## U.S. crude oil stocks

Billion barrels



## U.S. crude oil stocks held by industry

Billion barrels

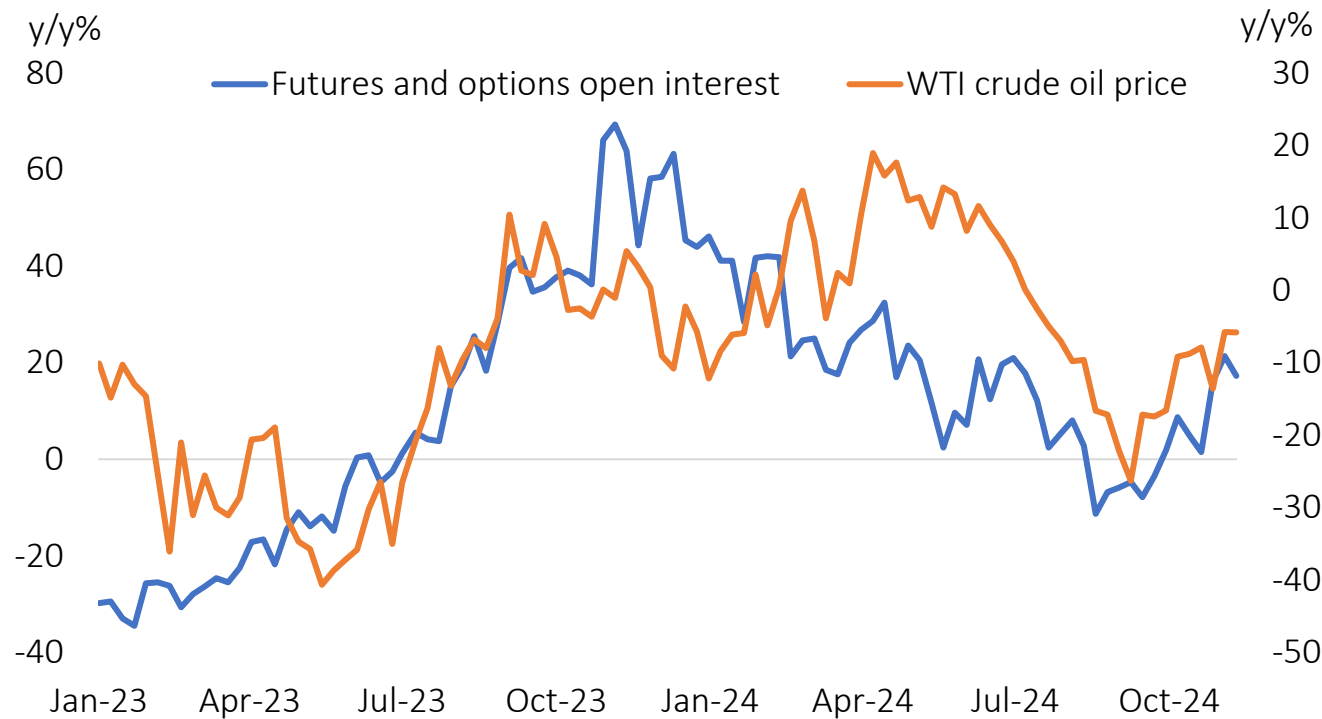


# Oil futures and options activity have recently been pro-cyclical with oil prices

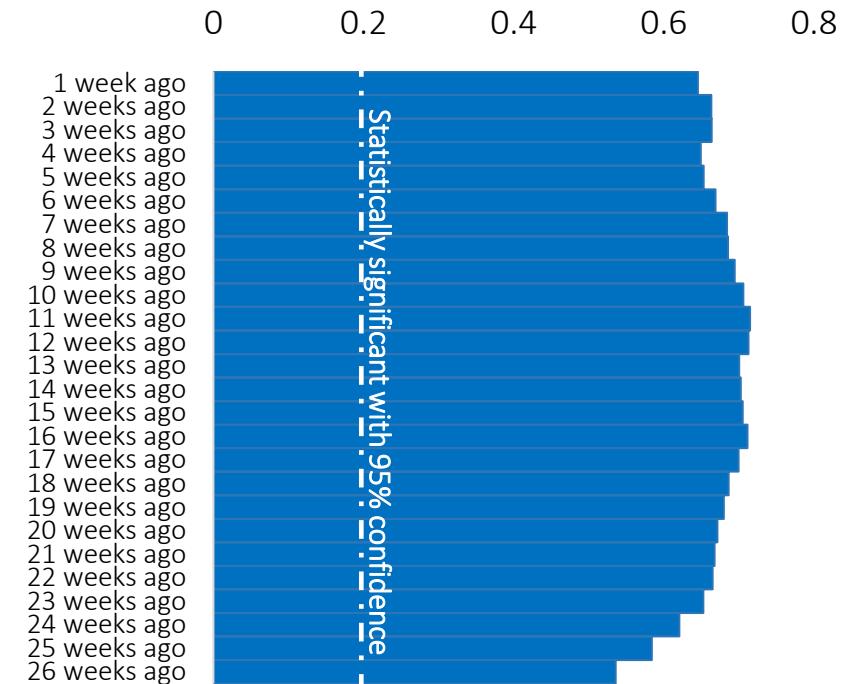


- Changes in WTI crude oil prices and past changes in the open interest in light sweet crude oil futures and options have exhibited a significant direct correlation as high as +0.7 since 2023
- Changes in light sweet crude oil open interest of up to 6 months prior have “Granger-caused” WTI price changes over the period; this is a temporal relationship, not causation, since external factors like geopolitics and production changes may influence both open interest and prices, confounding the analysis

## Light sweet crude oil prices and open interest changes, year-over-year



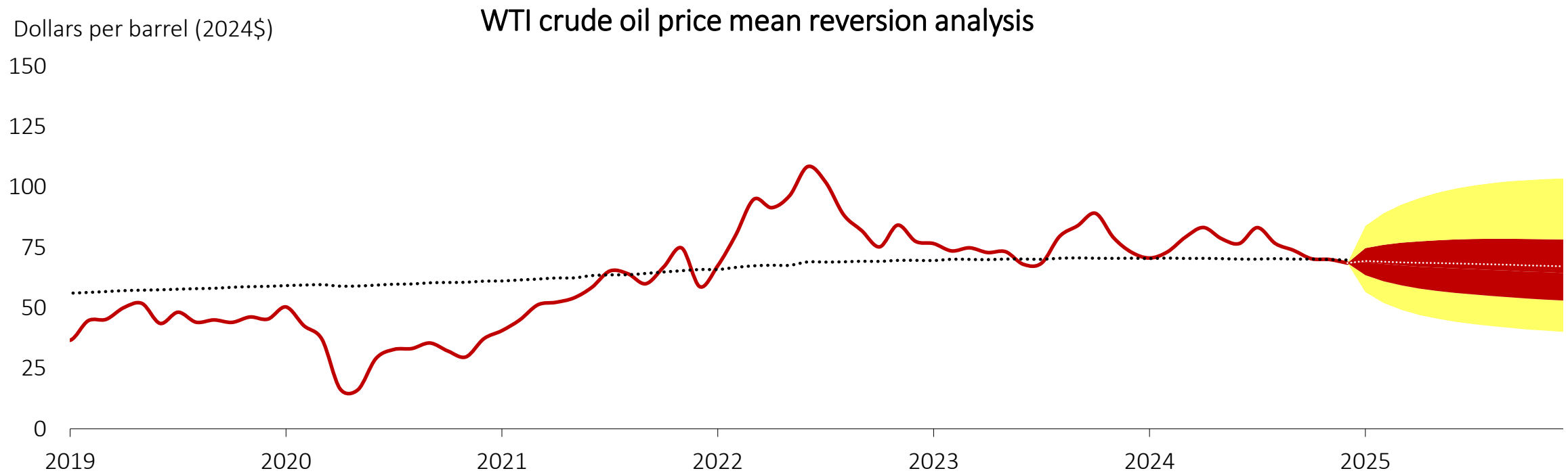
## Significant direct correlations between changes in crude oil prices and past open interest changes\*



\* Comparisons of WTI crude oil price changes year-over-year (y/y) with changes (y/y) in light sweet crude oil futures and options, from 1 to 26 weeks prior, as reported by CFTC

# Crude oil prices historical mean reversion analysis: Futures prices are aligned with their historical mean

- ▶ The futures strip has remained backwardated (that is, futures prices currently are lower than spot prices)
- ▶ Confidence intervals based on past prices show the potential for greater upside than downside





# Natural Gas Markets



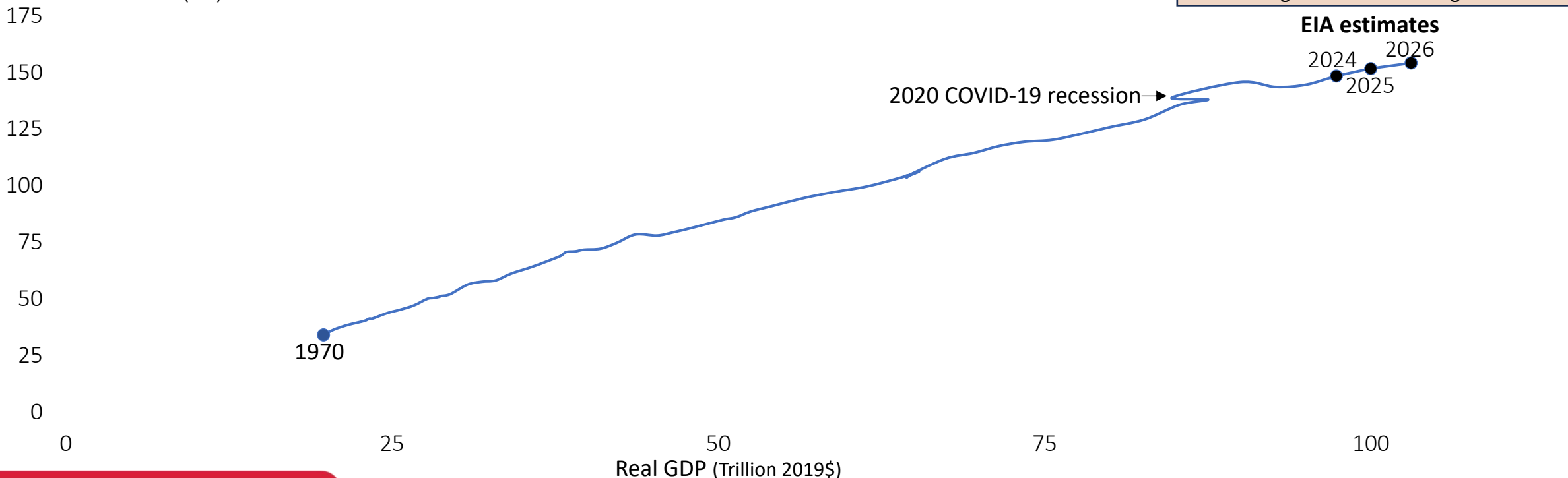
# Global natural gas demand could reach new record highs in 2025 and 2026



- ▶ Global natural gas demand reached a new high of 148.3 trillion cubic feet in 2024
- ▶ Demand growth has continued despite supply disruptions due to Russia's war in Ukraine since 2022, but is expected to slow from growth of 2.6% y/y in 2024 to 2.2% y/y in 2025, and 1.5% y/y in 2026
- ▶ About 75% of global natural gas demand growth stems from Emerging Markets and Developing Economies, so the continued expansion of liquefied natural gas (LNG) infrastructure is a key – and could be influenced by trade and tariff developments

## Global natural gas demand and GDP\*

Trillion cubic feet (tcf)

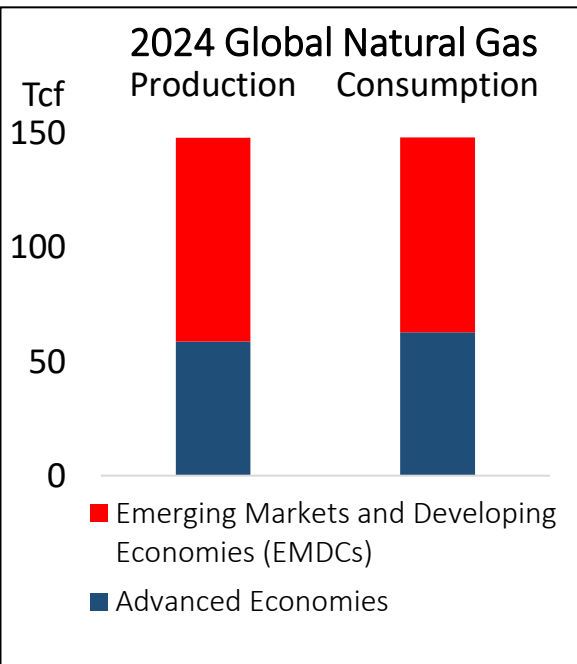
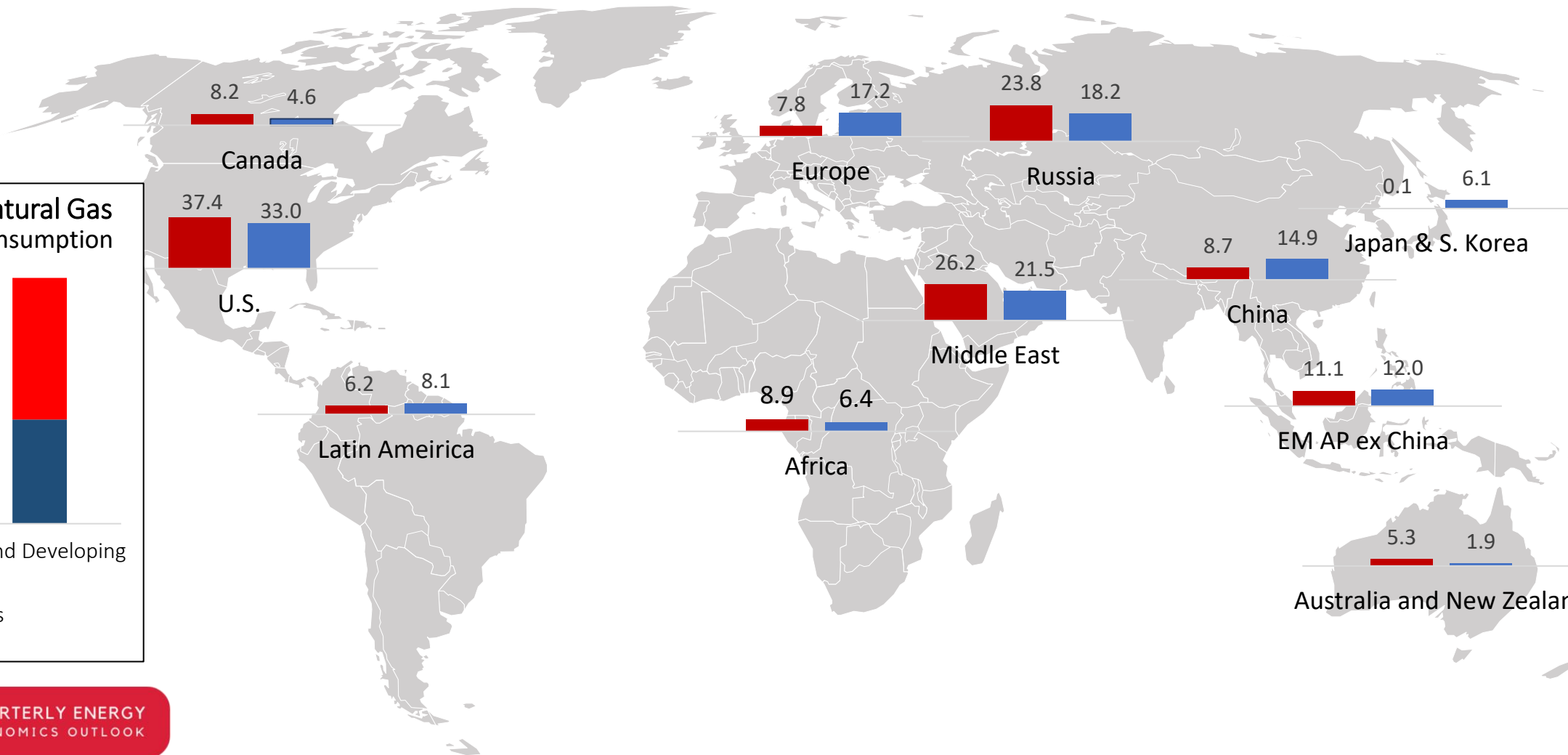


# U.S. natural gas production leads the world



- U.S. natural gas net exports exceeded a record high of 4.4 Tcf or 12 bcf/d through the first three quarters of 2024 – and continued to rank the U.S. as the world’s top LNG exporter
- In terms of total natural gas exports, however, Russia was the top natural gas exporter despite sanctions and logistical challenges

## 2024 Global natural gas production versus consumption – Trillion cubic feet (Tcf)



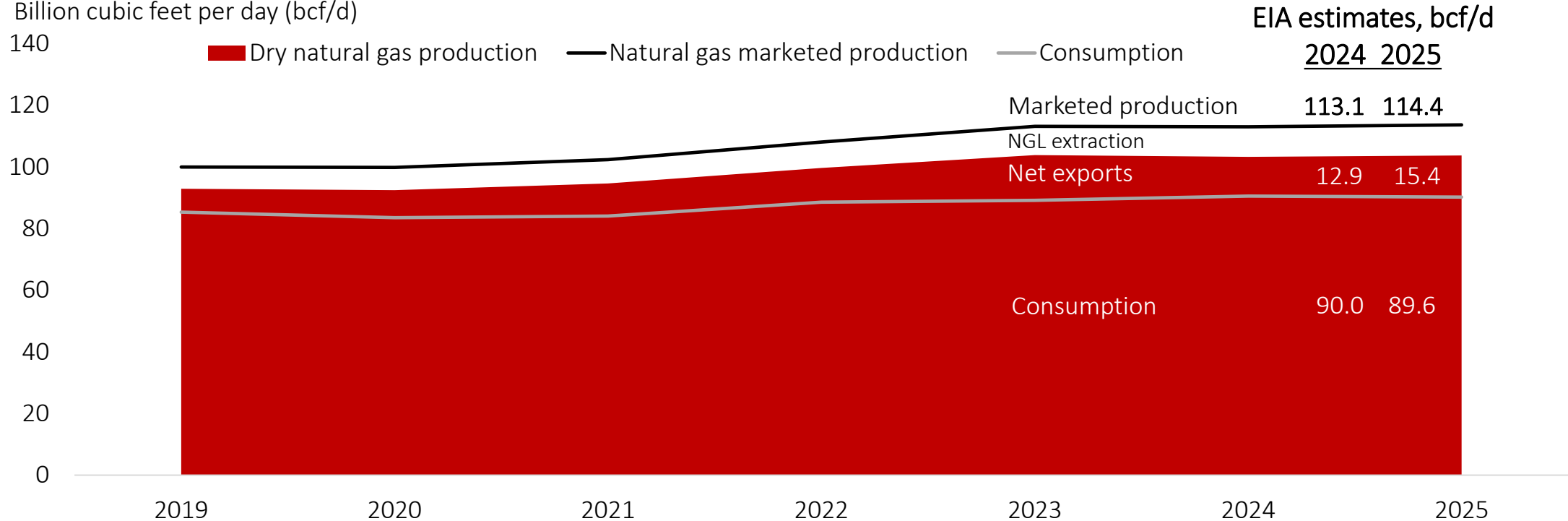
# U.S. natural gas marketed production is at a record 113 bcf/d in 2024—and poised to grow further in 2025



- U.S. dry natural gas production reached 113.4 bcf/d in Q4 2024 and could rise to a record high of 113.6 bcf/d in 2025 per EIA
- Texas produced 33.4 bcf/d of natural gas marketed production—second highest on record—including 27.8 bcf/d of dry natural gas and a record-high 3.9 mb/d of NGLs in November 2024 by TXOGA’s estimates

## U.S. natural gas production and disposition

Billion cubic feet per day (bcf/d)



# U.S. natural gas storage has exceeded its historical range despite strong consumption and exports



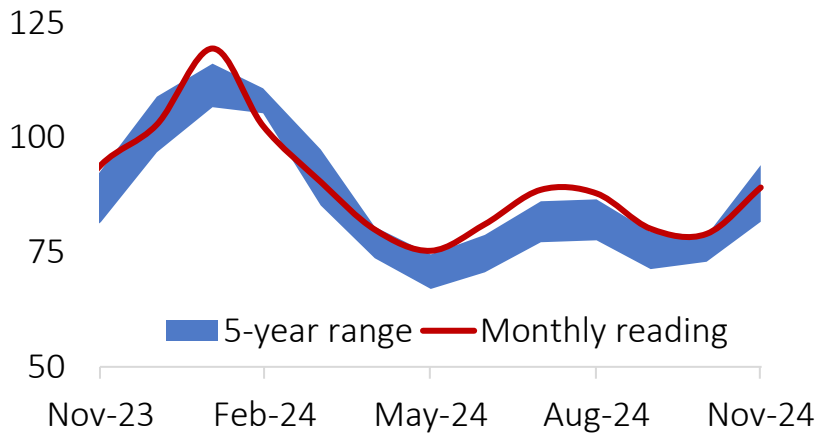
- U.S. natural gas consumption decreased by 5.2% y/y to 89.1 bcf/d in November – lowest for the month since 2020 by EIA estimates

- Natural gas net exports of 13.4 bcf/d in November remained at the top of the 5-year range

- With Texas and the Permian Basin driving strong production that more than offset the solid consumption and exports, U.S. natural gas inventories remained near the top of the 5-year range as of December 6, 2024

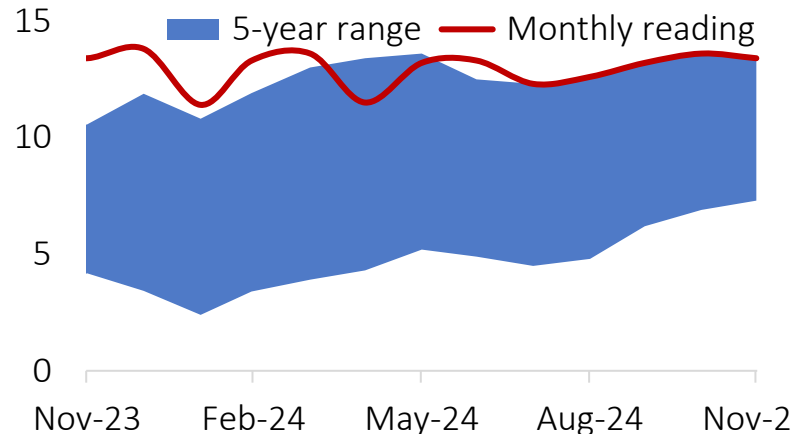
## U.S. natural gas consumption

Billion cubic feet per day, bcf/d



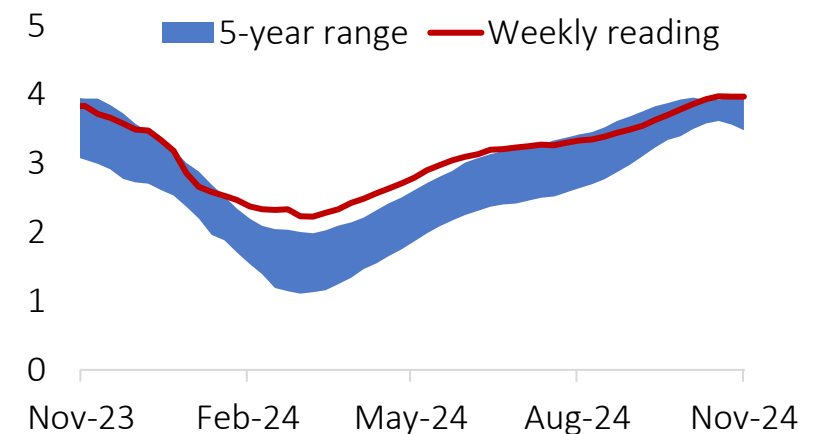
## U.S. natural gas net exports

Billion cubic feet per day, bcf/d



## U.S. weekly working gas storage

Trillion cubic feet (tcf)

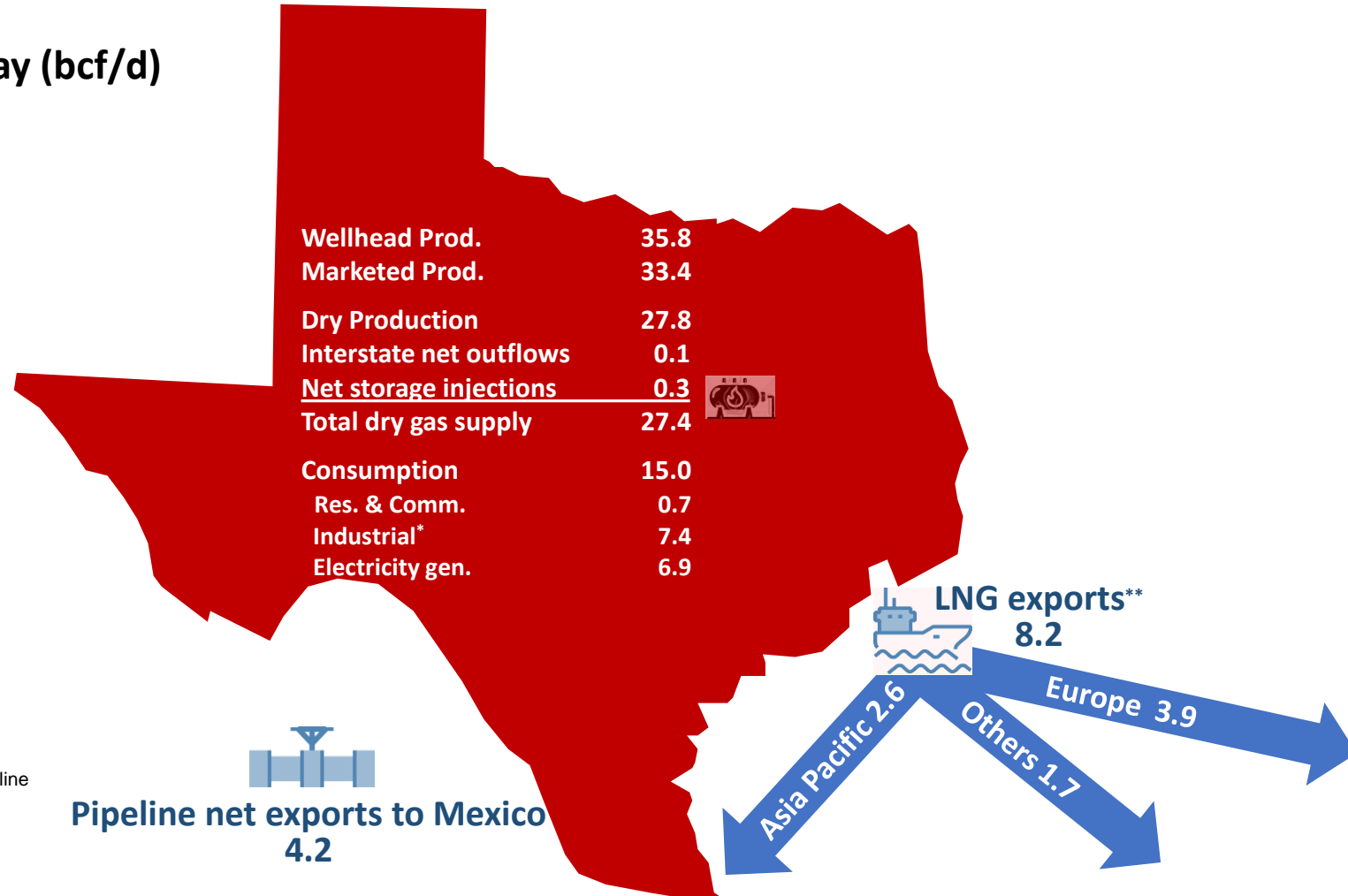




# Texas' natural gas flows in September 2024: Historically strong production supported increased exports and domestic production

- ▶ Texas produced 27.8 bcf/d of dry natural gas in September 2024 by TXOGA's estimates
- ▶ Texas consumers required 15.0 bcf/d, mainly for industry and electricity generation, while 12.4 bcf/d was exported, including 8.2 bcf/d of LNG and 4.2 bcf/d via pipelines to Mexico per U.S. International Trade Commission data

**Billion cubic feet per day (bcf/d)**



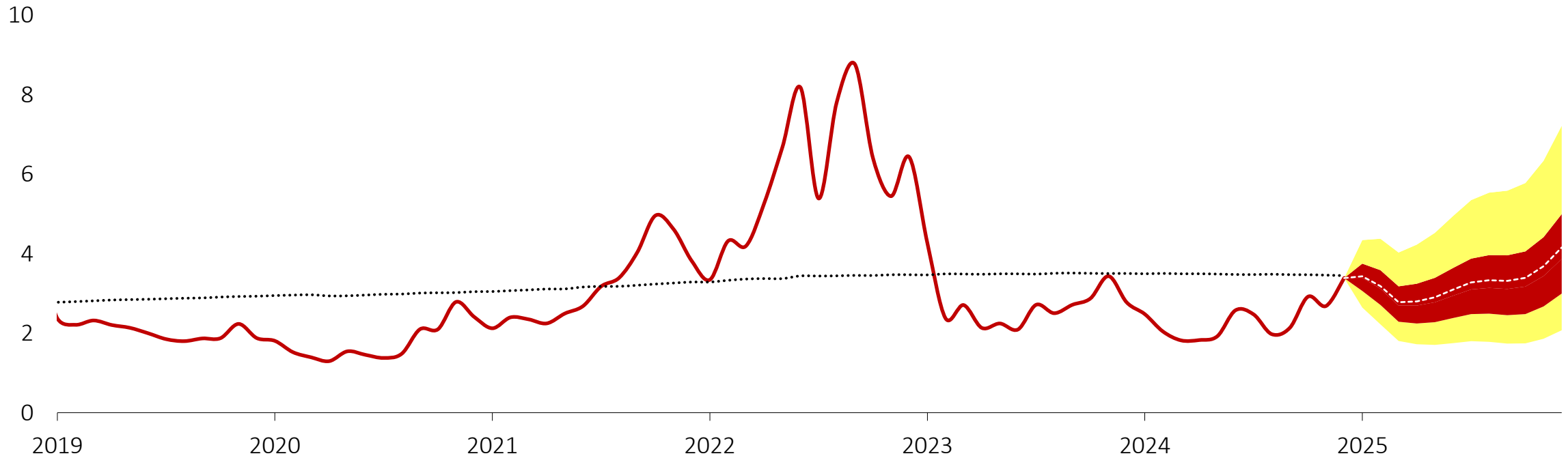
\*Includes industrial end-use consumption plus lease, plant, pipeline and distribution fuel \*\*USITC Texas export districts

# Near-term natural gas futures prices vary in line with their historical mean reversion target

- ▶ As of December 16, 2024, natural gas futures prices of \$3.18 per million Btu for January delivery align with the historical mean, and the contracts for winter 2025-2026 delivery are over 30% higher
- ▶ Confidence intervals based on past prices show the potential for greater upside than downside

## Natural gas price mean reversion analysis

Dollars per million Btu (2024\$)



# Productivity, Jobs, and Wages

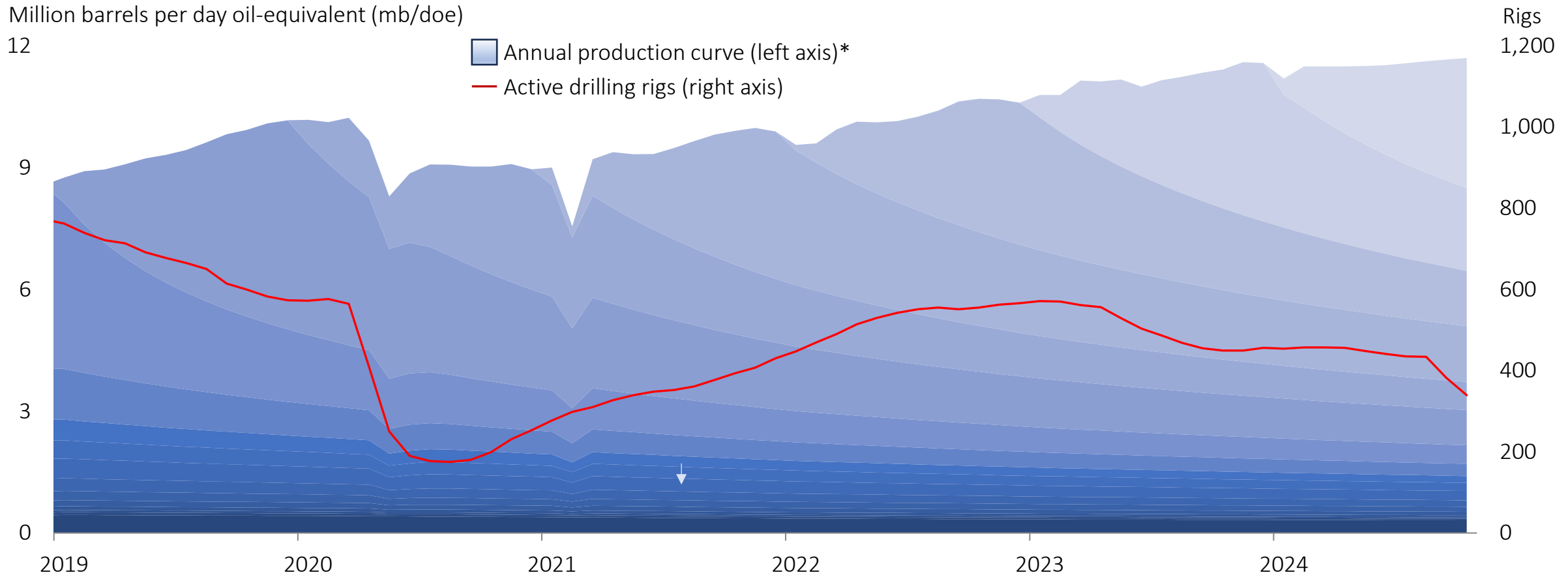




# Led by the Permian Basin, Texas' shale oil and tight gas production has risen despite the utilization of fewer rigs



➤ EIA estimates show oil and natural gas production across Texas shale basins changes in October 2024: Permian (+3.0% y/y), Eagle Ford (1.7% y/y), Anadarko (-5.3% y/y) and Haynesville (-11.1% y/y)



\*Crude oil, condensates, natural gas gross withdrawals from Texas' Anadarko, Eagle Ford, Haynesville, and Permian Basin production regions.

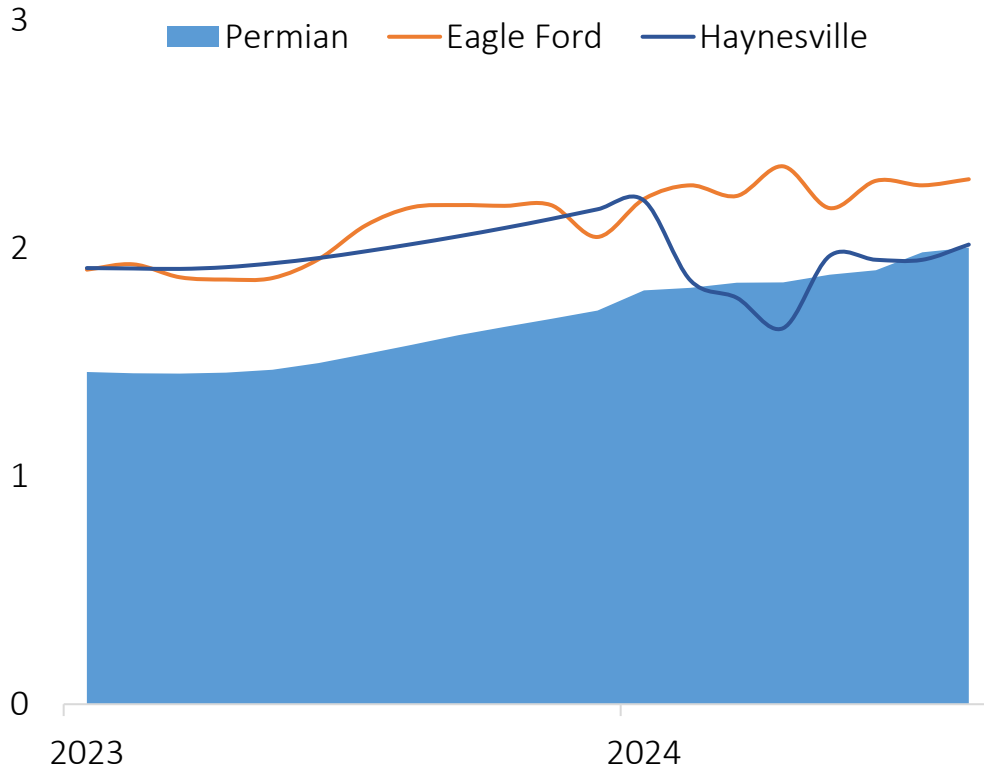
# Rig productivity gains have continued to enable production growth



- Solid productivity: EIA's revised estimates of rig productivity across major Texas producing basins in October 2024 show strong increases year-over-year for the Permian Basin (+21.0% y/y), but a modest gain in the Eagle Ford (+2.3% y/y)

## Texas rig productivity by basin – new monthly production per rig

Thousand barrels per day oil-equivalent, kb/doe



## Oil and natural gas innovation headlines

### Shale Oil Is More Likely To Boom Than Peak

Forbes, December 3, 2024

### Drilling advances: Is it always only about people?

WorldOil.com, November 2024

### Automation, Robotics Transforming How Industry Drills Wells

JPT.SPE.org, November 2024

### The Evolution of the Land Drilling Rig

JPT.SPE.org, October 2024

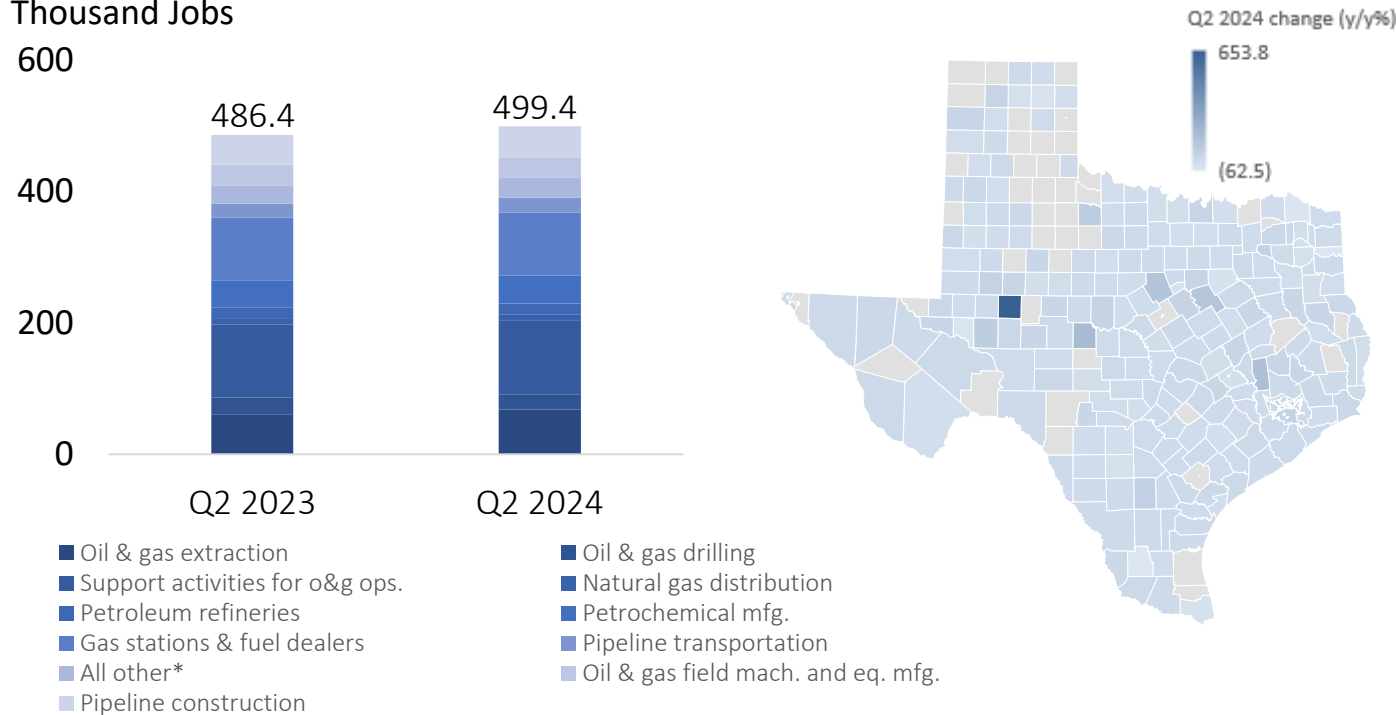
# Texas' oil and natural gas industry employment rose to 499,444 in Q2 2024



- ▶ Texas' oil and natural gas industry employment and wages grew by 2.7% y/y and 6.7% y/y, respectively, in Q2 2024, raising the totals to nearly 499,444 jobs and \$14.3 billion in wages.
- ▶ 64% of the year-over-year job growth occurred in the upstream and supporting services, while nearly 40% of the job growth occurred in pipeline construction and transportation per the latest data (released on November 15, 2024) from the U.S. Census Bureau and Texas Workforce Commission.

## Texas oil and natural gas industry direct employment rose by +2.7% y/y in Q2 2024

Thousand Jobs



## Texas oil and natural gas industry direct wages rose by +6.7% y/y in Q2 2024

Billion dollars




\* Other industry segments include petroleum and pet. product wholesalers, lubricant mfg., asphalt mfg., industrial sand mining, nitrogenous fertilizer mfg., basic organic chem. mfg., plastics and resin mfg.

# Thank you for your attention!


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