



February 12, 2024



TXOGA's chartbook provides a vital reference for our members as well as those who are interested in understanding data which tell the story of what's happening with the economy, oil and gas markets at the global, U.S. and Texas levels.

Key points for the week of February 12, 2024

- **Steady U.S. economic outlook.** The ADS Business Conditions Index, published by the Federal Reserve Bank of Philadelphia, indicated steady GDP growth in Q1 2024.
- **Oil prices increased on solid fundamentals.** West Texas Intermediate (WTI) crude oil prices climbed to \$76.67 per barrel for the week ended February 9, due to strong fundamentals and geopolitical uncertainties. Data from the U.S. Energy Information Administration (EIA) for the week ended February 2 show that U.S. petroleum demand rose by 0.1 million barrels per day (mb/d) to 20.2 mb/d. Despite petroleum net exports maintaining a record pace for this time of year, crude oil stocks experienced a week-over-week (w/w) increase of 1.2 million barrels.
- **Natural gas market dichotomy continued.** The U.S. natural gas market has continued to record-low prices despite historically low storage levels. Prices dropped to \$1.85 per million Btu, which in real terms was the lowest for early February on record since 1994, even as working gas storage levels dropped, based on the latest EIA data released on February 8.
- **The [Chart of the Week](#) highlights current mean reversion analysis of oil and natural gas prices.** Oil futures prices have aligned with their historical mean, while natural gas prices have fallen below it. Confidence intervals based on past prices show the potential for greater price upside than downside.

TXOGA Chart of the Week: Mean reversion analysis of crude oil and natural gas prices

Defining terms

- Mean reversion analysis can be a useful tool to assess short-term markets. It is not a forecast but rather shows how futures prices (white dotted line) compare with historically based confidence intervals and an estimated mean reversion target (black dotted line), which is also based on past data.
- The mean reversion (MR) target is an estimate based on a best-fit curve through past data, including years of data not shown, so the charts highlight recent markets.
- Historical variation and the tendency of prices to return to their mean inform the estimated confidence intervals.

Reading these charts

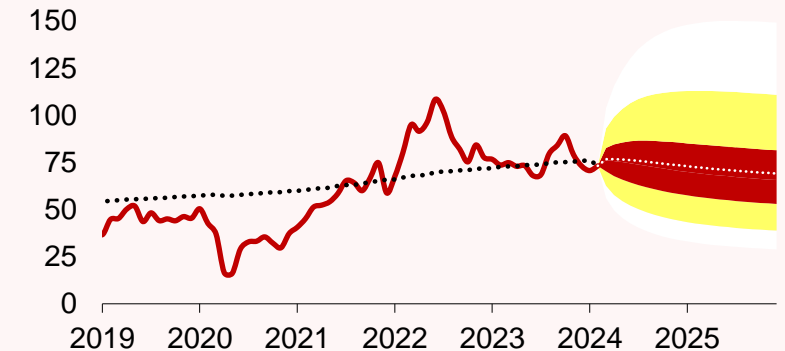
1. Compare recent and futures prices with the estimated MR target. Although prices could differ from the MR target for an extended period, their relative positioning can be informative.
2. Assess the futures prices, whether they increase or decrease and any seasonality.
3. Consider the historical variation around futures prices (red, yellow, and white ranges).

Current takeaways

- Prices have aligned with the MR historical target for crude oil but fallen below it for natural gas.
- Crude oil futures prices remain lower in future periods (“backwardated”), while natural gas futures prices are higher in future periods (“contango”).
- Confidence intervals show the potential for greater upside than downside.

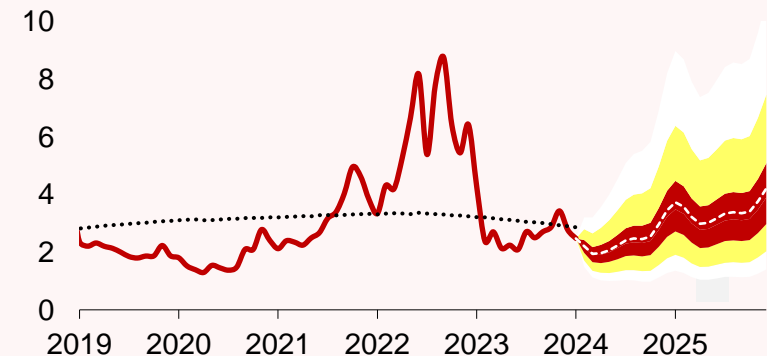
WTI crude oil price mean reversion analysis

Dollars per barrel (2024\$)



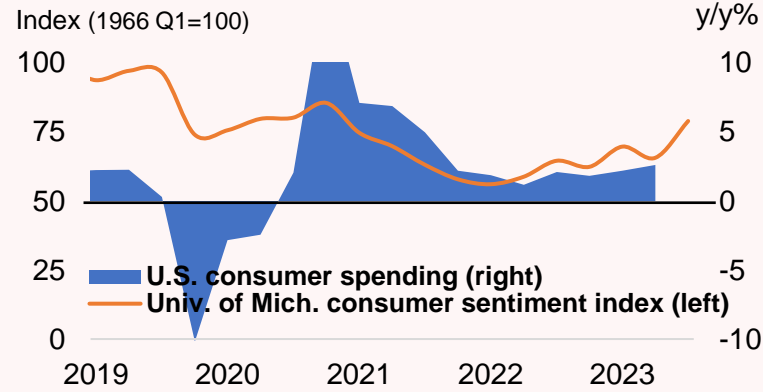
Natural gas price mean reversion analysis

Dollars per mmBtu (2024\$)



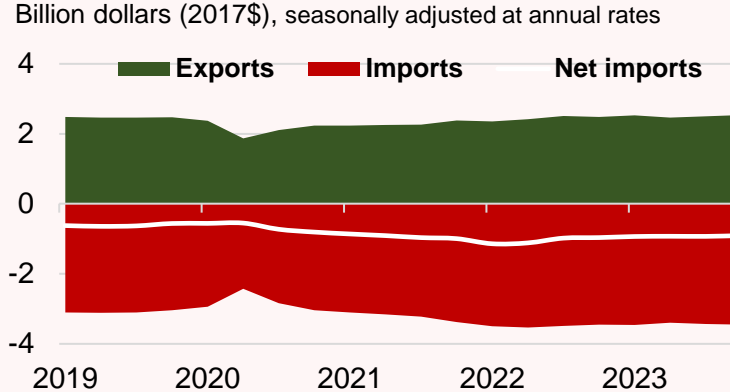
U.S. economic indicators

Consumer sentiment vs. spending



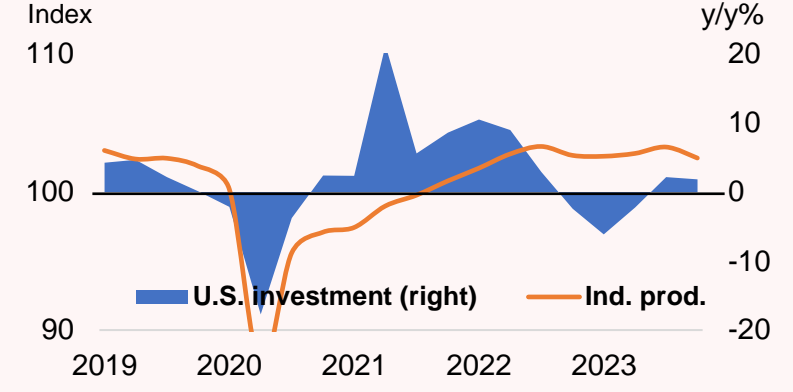
Consumer sentiment rose further. In its final reading for January 2024, the Univ. of Michigan consumer sentiment index was revised up (by 0.2) to 79.0, the highest reading since July 2021. This is consistent with the historical correspondence to consumer spending growth that rose by 2.6% y/y in Q4 2023.

Real net exports of goods and services



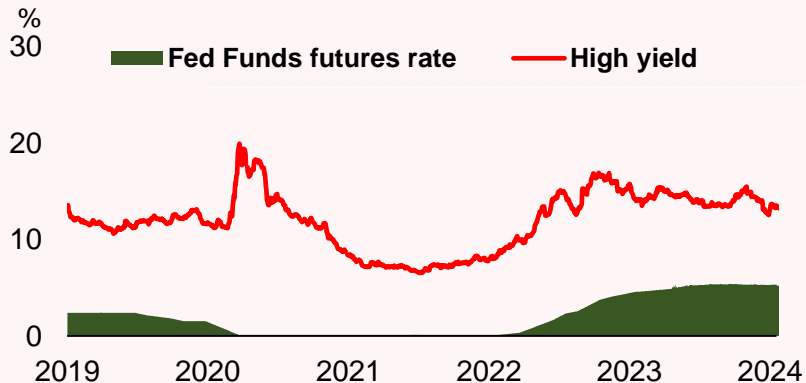
The U.S. trade deficit narrowed in Q4 2023. The U.S. real trade deficit ran at an annualized rate of \$908 billion in Q4 2023, down from \$931 billion in Q3 per the U.S. Bureau of Economic Analysis. On a nominal basis, the trade surplus for petroleum and products ran at annualized rate of \$16 billion in Q4 2023, down from \$29.1 billion in Q3.

Industrial production and investment growth



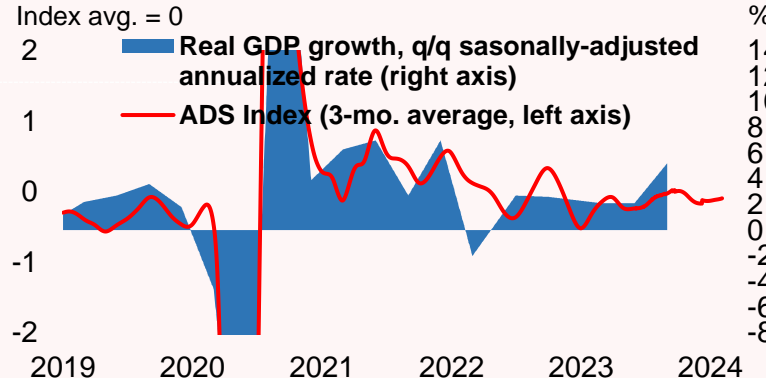
Investment growth continued in Q4 2023. Consistent with industrial production, economy-wide was revised up to 2.1% y/y for Q3 and rose by 1.8% y/y in Q4 per the Bureau of Economic Analysis. Industrial production has remained flat in recent months, and in December 2023 it rose by 0.1% m/m and 1.0% y/y.

Fed Funds rate and CCC and lower corporate bond yields



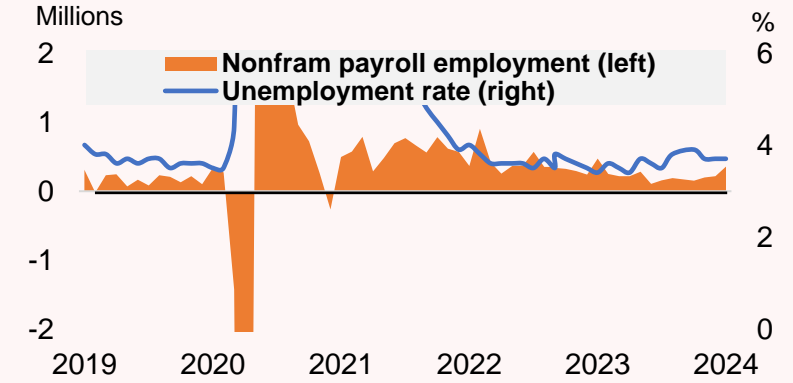
Bond premium for low credit quality edged up. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. For the week ended Feb. 8, HY rates of 13.62% rose by 0.12% w/w while the Fed Funds futures rate rose by 0.05%, yielding a risk spread that widened by 0.08% (8 bps) for the week.

Aruoba-Diebold-Scotti Business Conditions Index (qtr. avg.) vs. U.S. real GDP growth



Business conditions consistent with Q1 2024 real GDP growth. The ADS business conditions index, published by the Philadelphia Fed. Res. Bank, is a leading indicator of GDP growth. A rolling 3-month average of the ADS index accurately reflected the increase in Q4 2023 real GDP and remains consistent with continued GDP growth so far in Q1 2024.

Nonfarm payroll employment & unemployment rate

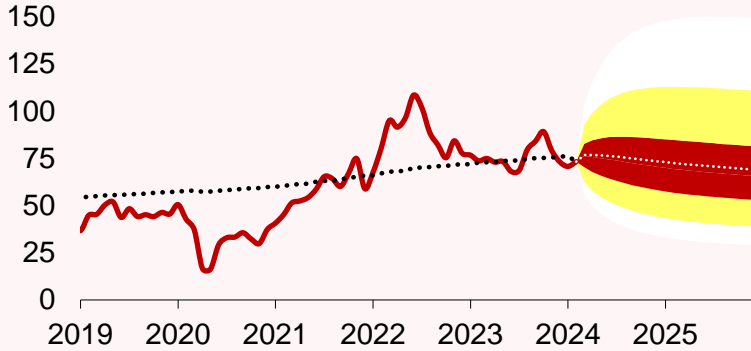


Steady unemployment rate, increased payrolls. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate held steady at 3.7% in January per BLS, while non-farm payrolls rose by 353,000.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

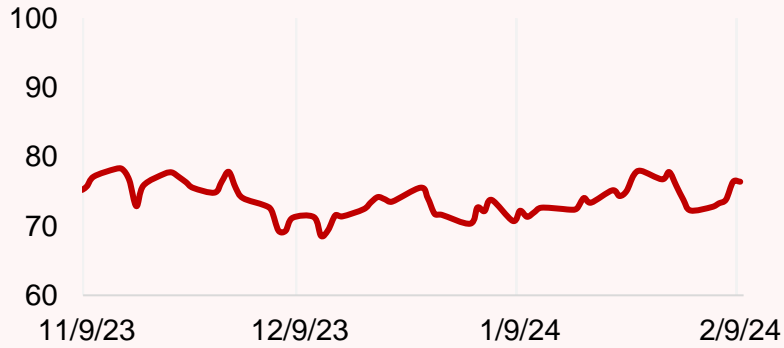
Dollars per barrel (2024\$)



Futures prices have aligned with their historical mean. The futures strip 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.

WTI crude prompt month futures prices

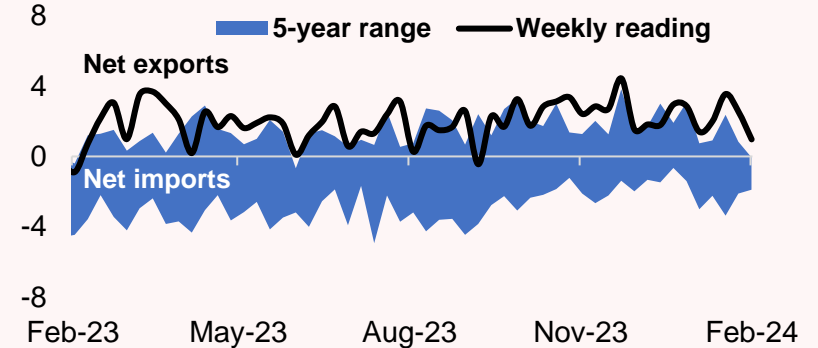
Dollars per barrel



WTI crude oil prices rebounded to \$76.77 per barrel for the week ended Feb. 9, reflecting a geopolitical premium, increased domestic demand, record exports for the period, and historically low inventories.

U.S. petroleum net exports (imports)

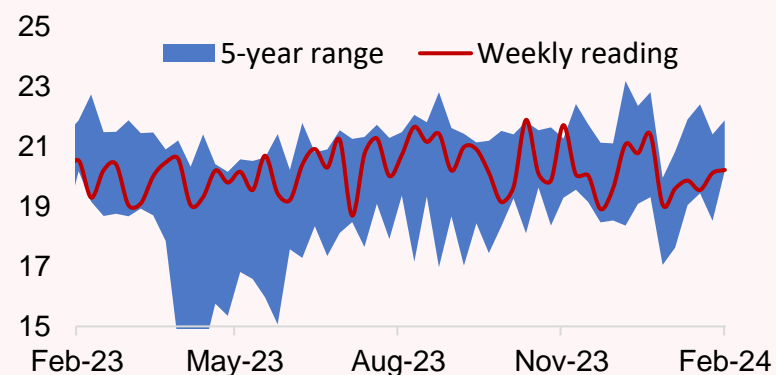
Million barrels per day, mb/d



Petroleum net exports fell. The U.S. was a petroleum net exporter of 1.0 mb/d for the week ended Feb. 2, down by 1.5 mb/d w/w but still at a record level for this time of the year.

U.S. petroleum demand

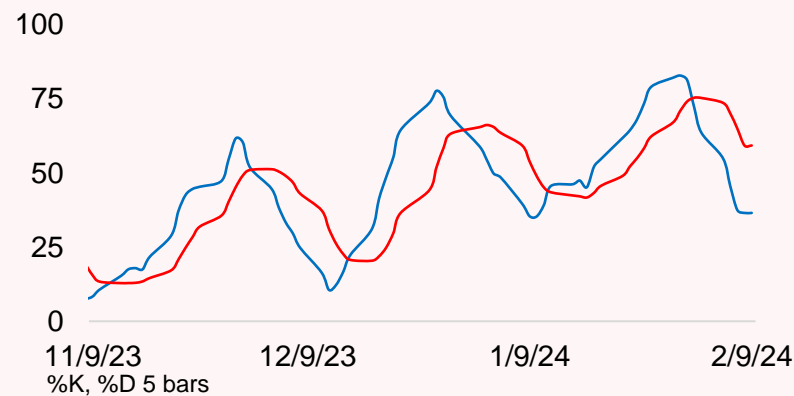
Million barrels per day (mb/d)



Petroleum demand edged up. U.S. petroleum demand, as measured by deliveries, rose by 0.1 mb/d w/w to 20.2 mb/d for the week ended Feb 2.

WTI crude prompt month futures slow stochastic

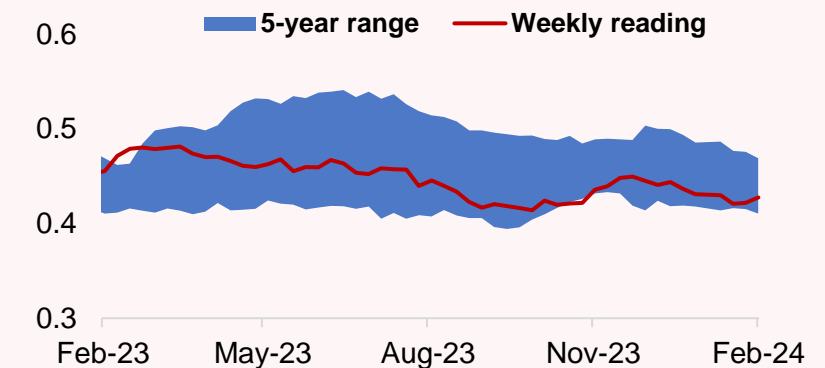
Index level



Price momentum paused for the week ended Feb. 9.

U.S. ending stocks of crude oil (excluding the SPR)

Billion barrels (mb)

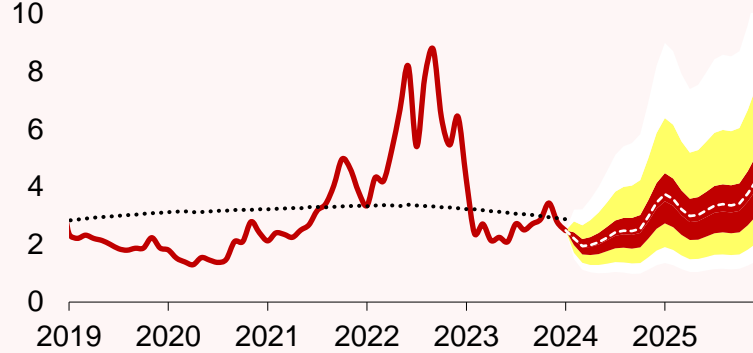


Inventories increased. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) increased by 5.5 million barrels (mb) for the week ended Feb. 2 but stood in the lowest 30% of the 5-year range.

U.S. natural gas market indicators

Natural gas price mean reversion analysis

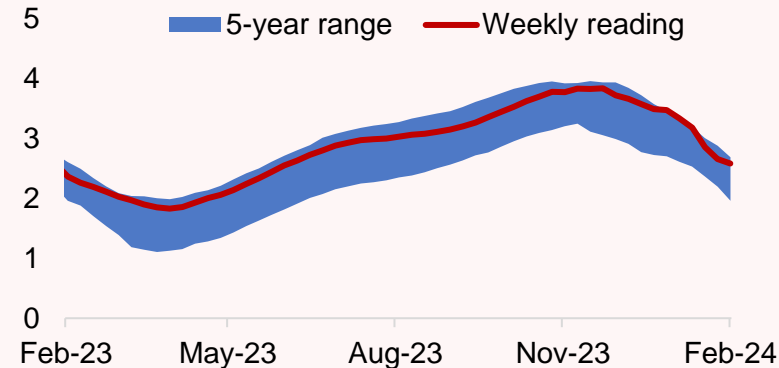
Dollars per mMBtu (2024\$)



Natural gas futures prices fell below their historical mean. Natural gas futures prices through October 2024 fell below their historical mean. Futures prices progressively rise beginning in March 2024. Confidence intervals based on past prices show the potential for greater upside than downside.

U.S. weekly working gas storage

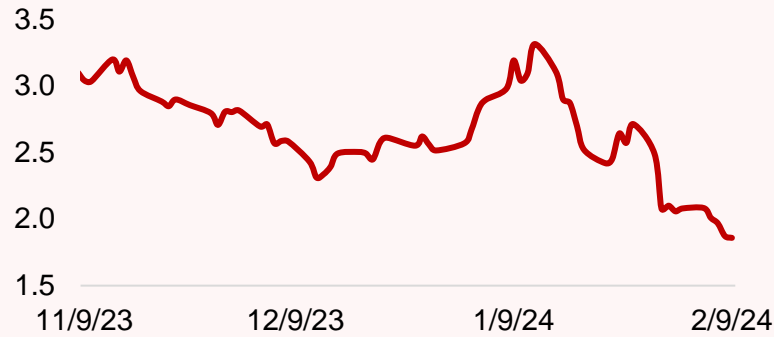
Trillion cubic feet (tcf)



Storage dropped 19% below the 5-year range. Working gas in underground storage (2.6 tcf as of Feb. 2) fell within its 5-year range.

Natural gas prompt month futures prices

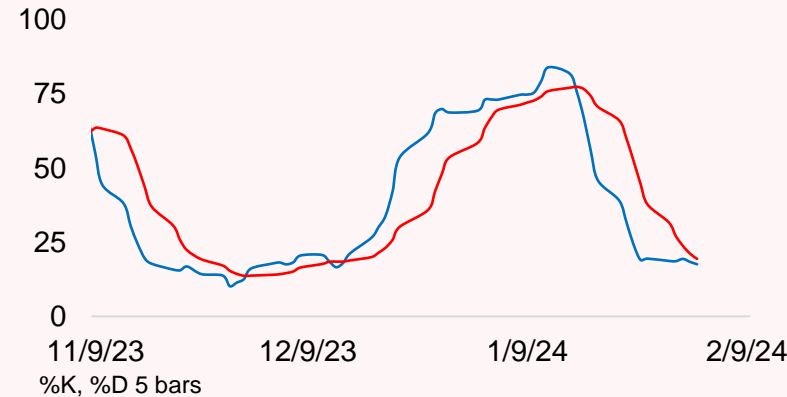
Dollars per million Btu



Natural gas prices at Henry Hub remained dropped to \$1.85 per million Btu for the week ended Feb. 9 despite continued storage withdrawals and historically low inventories.

Natural gas futures slow stochastic

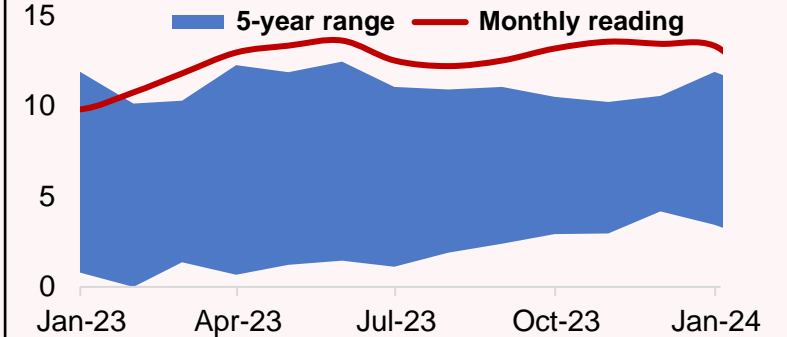
Index level



Natural gas price momentum continued to decrease and then pause during the week ended Feb. 9.

U.S. natural gas net exports

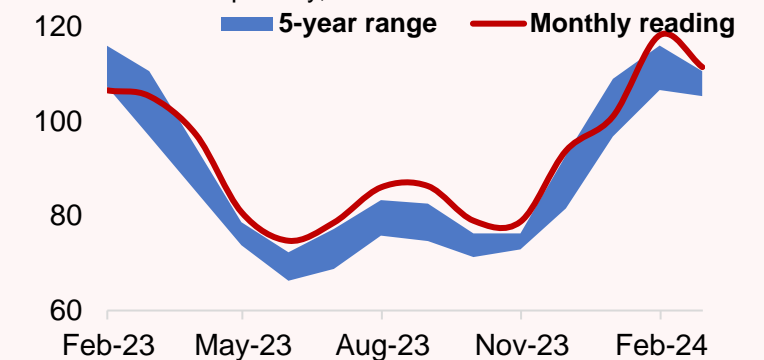
Billion cubic feet per day, bcf/d



Strong net exports have continued. U.S. natural gas net exports in February are estimated at 12.4 bcf/d, up from 11.8 bcf/d a year ago and above the 5-year range, per the EIA.

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

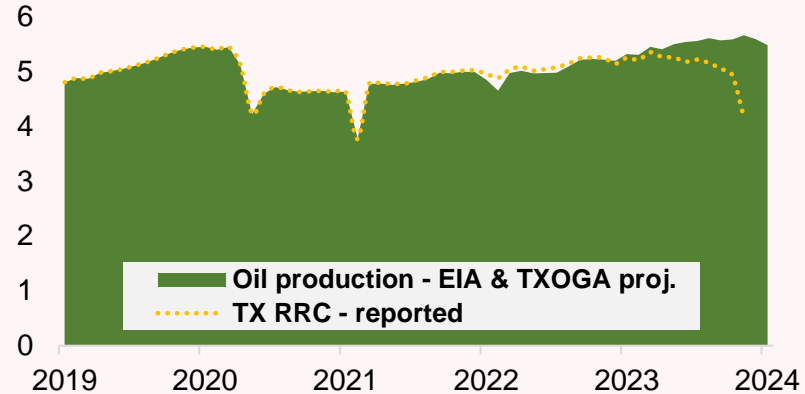


Record high consumption has continued. EIA estimates that natural gas consumption has eased from a record monthly high of 118 bcf/d in January to 111 bcf/d in February -- the highest U.S. consumption on record for the month of February.

Texas' oil and natural gas production

Texas crude oil production, Jan. 2019 – Jan. 2024

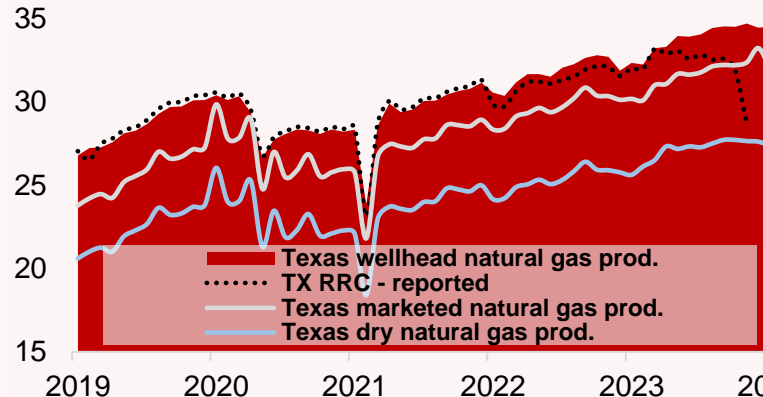
Million barrels per day (mb/d)



Record high production in November. Texas' oil production of 5.7 mb/d in November was a record high per the EIA. TXOGA estimates that Texas crude oil production eased to 5.6 mb/d in December and 5.5 mb/d in January.

Texas natural gas production, Jan. 2019 – Jan. 2024

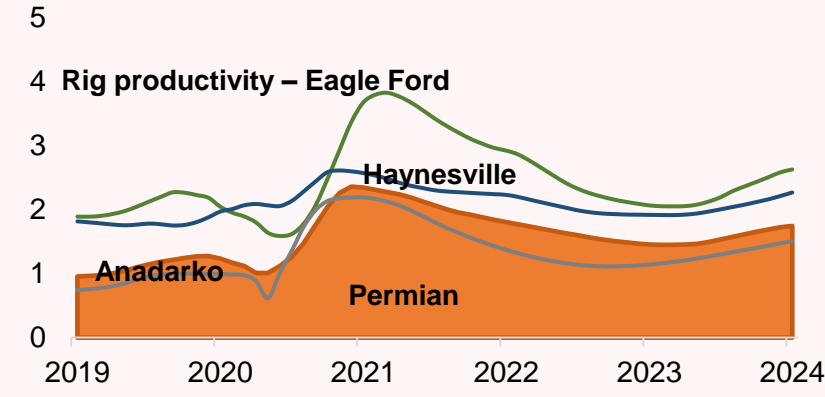
Billion cubic feet per day (bcf/d)



November production records. Texas' natural gas production of 34.7 bcf/d of gross withdrawals and 32.4 bcf/d of marketed production in November were record highs per EIA. TXOGA estimates that production eased through January to 34.5 bcf/d of gross withdrawals, 32.0 bcf/d of marketed production, and 27.4 bcf/d of dry gas production.

Texas rig productivity by basin – new monthly prod. per rig

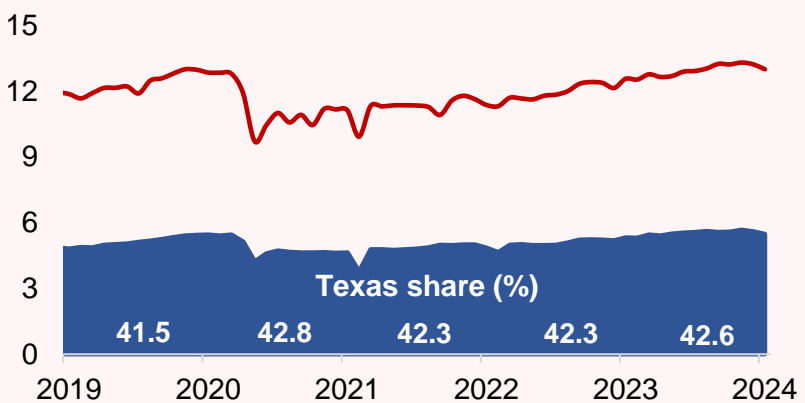
Thousand barrels per day oil-equivalent, kb/dae



Strong productivity to start the year. EIA estimates of rig productivity for January 2024 show continued increases year-over-year across the major Texas basins, including the Anadarko (+32.0% y/y), Eagle Ford (+27.2% y/y), Haynesville (+18.3% y/y), and Permian (+20.0% y/y).

U.S. and Texas crude oil production, Jan. 2019 – Jan. 2024

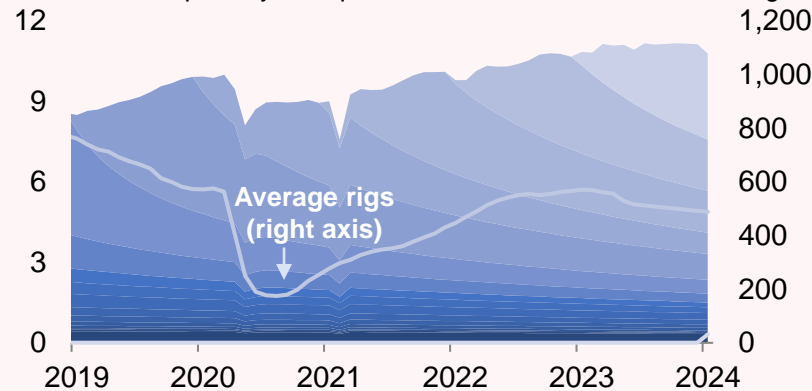
Million barrels per day (mb/d)



Texas' share rose. In 2023, Texas accounted for 42.6% of U.S. crude oil production by EIA and TXOGA's estimates, the highest share since 2020.

Texas shale basin wellhead oil & natural gas production

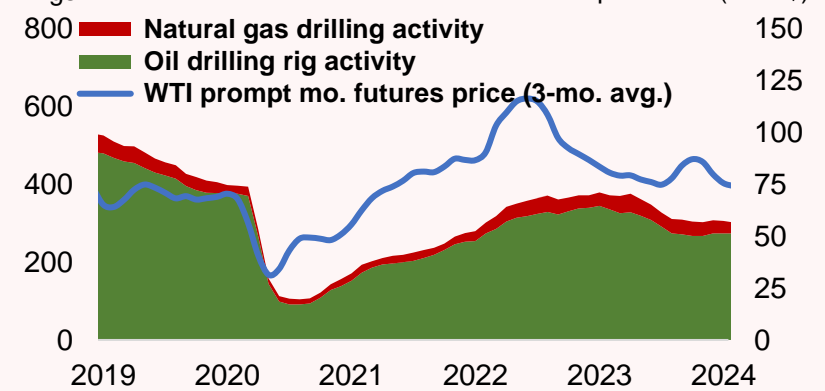
Million barrels per day oil-equivalent



EIA estimates Jan 2024 production growth across Texas shale basins has been mixed, with increases year-over-year in the Permian (+6.3% y/y) and Eagle Ford (+3.6% y/y) but decreases in the Haynesville (-0.2% y/y) and Anadarko (-1.2% y/y) regions.

Texas drilling activity and WTI crude oil futures prices

Rigs Dollars per barrel (2024\$)



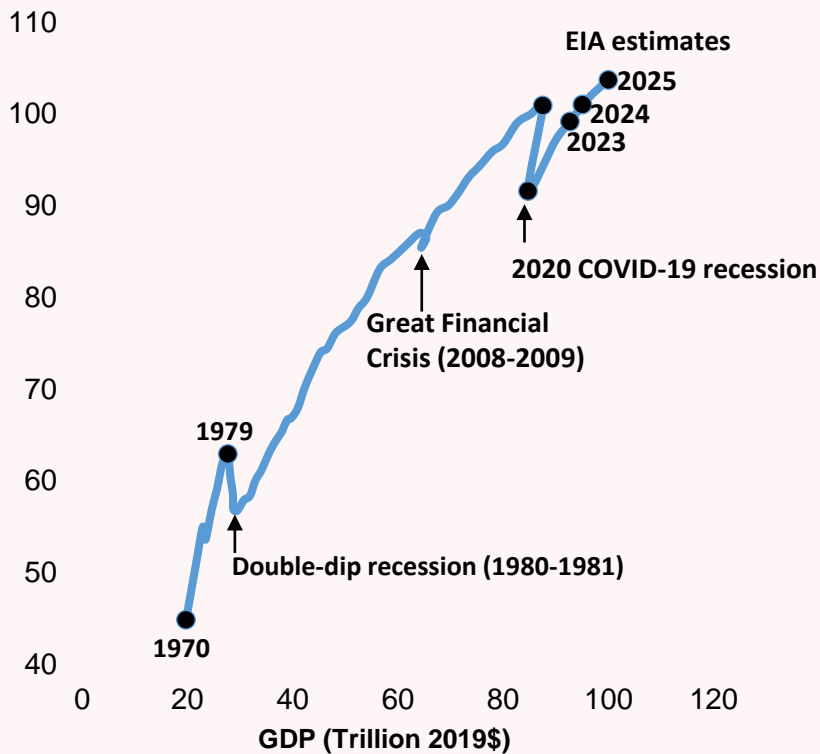
Texas' drilling rig activity decreased for the week ended Feb. 9 per Baker Hughes. Texas had 274 oil-directed rigs (unchanged w/w) and 27 natural gas-directed rigs (down by 2 rigs w/w).

Global Oil Market Balance Projections to 2025 by EIA

- Record-high demand. Global oil demand is expected by the EIA rise from a record 101.0 mb/d in 2023 to 102.4 mb/d in 2024 and 103.7 mb/d in 2025.
- Supply shift. As global oil supply is projected to rise 2.4 mb/d by 2025, EIA expects the U.S. to supply about one-third of global production growth over the next two years, compared with over 60% in 2023.
- For oil inventories, the EIA projects global stock withdrawals with a deficit of 0.8 mb/d in Q1 2024, corresponding with Brent crude oil prices of \$82.42 in 2024, compared with \$81.62 per barrel currently.

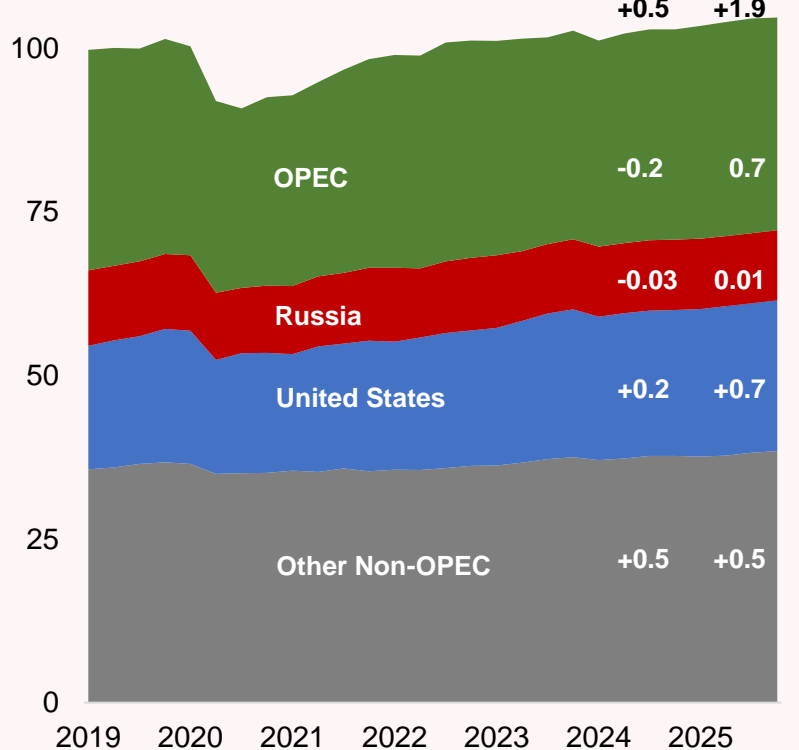
Global oil demand and GDP

Million barrels per day (mb/d)



Oil production by country/region

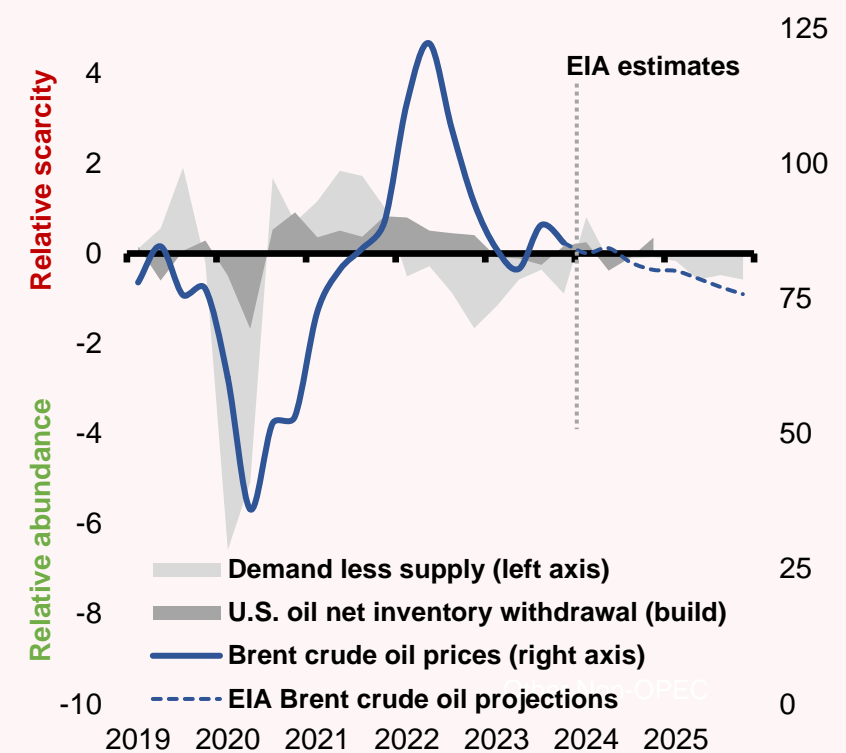
Million barrels per day, mb/d



Global demand/supply & Brent prices

Million barrels per day (mb/d)

2024\$/Bbl

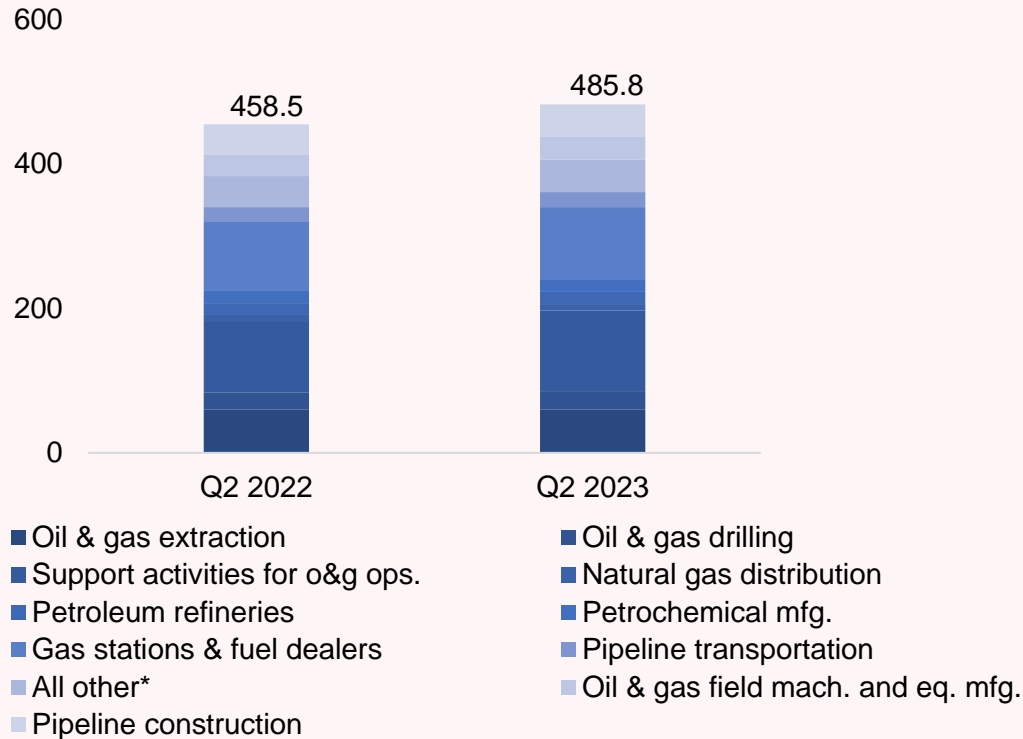


Texas' oil and natural gas industry's jobs and wages rose solidly

- ▶ Texas' oil and natural gas industry employment rose by 6.0% y/y in Q2 2023 with over half of the job growth in upstream drilling, extraction and support services, per data from the U.S. Census Bureau and Texas Workforce Commission
- ▶ Industry wage growth of 9.3% y/y outpaced job growth of 6.0% y/y, which reflected wage escalation

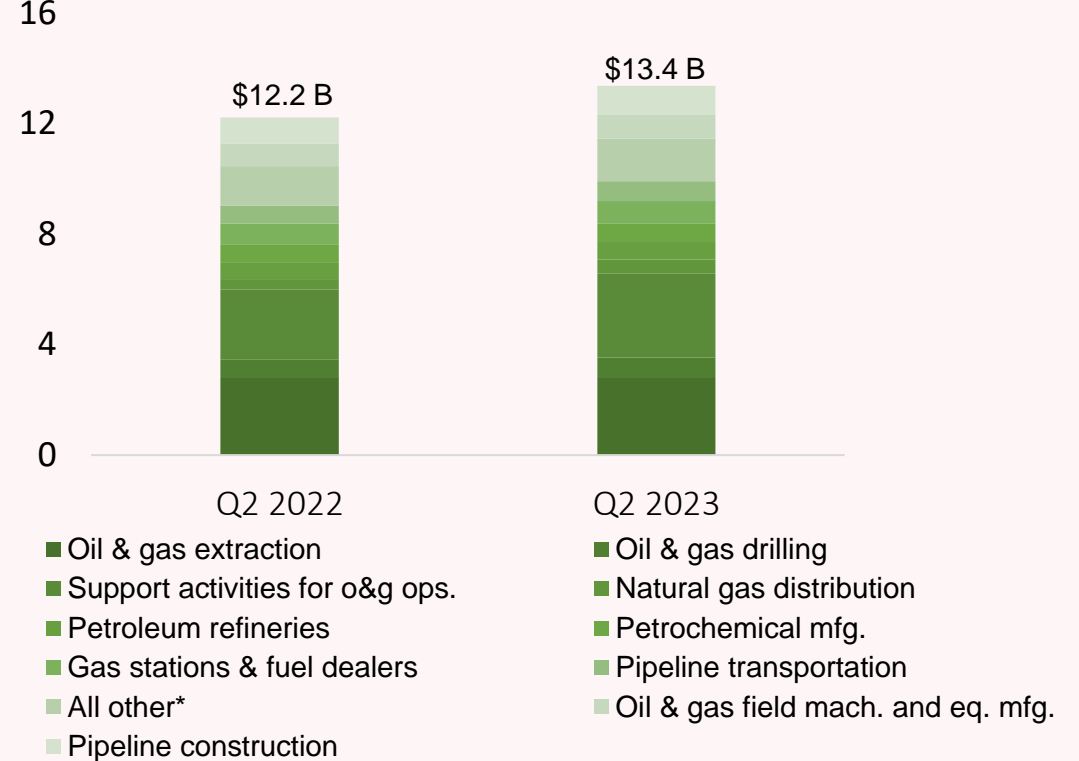
Texas Oil & Gas Industry Employment Rose by +6.0% y/y in Q2 2023

Thousand Jobs



Texas Oil & Gas Industry Quarterly Wages Rose by +9.3% y/y in Q2 2023

Billion dollars



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

R. Dean Foreman, Ph.D.
dforeman@txoga.org

