



December 18, 2023



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 December 18, 2023

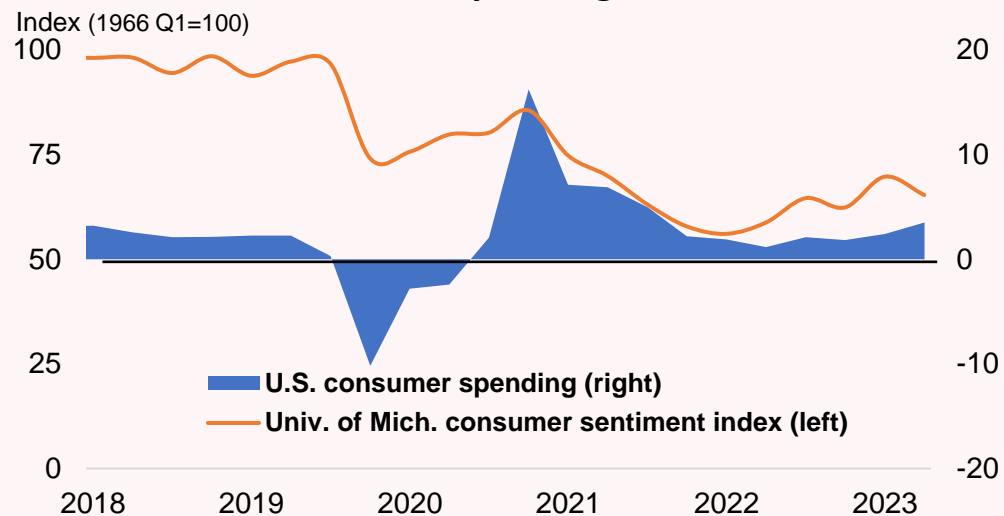
- ▶ **Strengthened economic indicators.** Consumer price inflation eased to 3.1% year-over-year in November per the U.S. Bureau of Labor Statistics. As highlighted in the [Chart of the Week](#), U.S. consumer sentiment rebounded in early December, which historically has supported consumer spending and GDP growth. The yield premium for lower-grade corporate bonds continued to fall during the week ended December 15 to its lowest since September.
- ▶ **Oil prices steadied as markets tightened.** Oil prices rose to \$72 per barrel on the strengthened economic indicators and as the U.S. Energy Information Administration (EIA) reported: 1) U.S. ending stocks of crude oil (excluding the SPR) fell by 4.3 million barrels, and 2) U.S. petroleum consumption rose to 21.1 million barrels per day (mb/d), which stood in the top half of the 5-year range.
- ▶ **U.S. natural gas prices fell despite lower storage levels.** U.S. natural gas prices fell to \$2.50 per million Btu for the week ended Dec. 15, despite strong exports and a 1.5% week-over-week drawdown in storage, which has downshifted into its 5-year historical range.
- ▶ **Rising futures prices.** Futures prices for oil and natural gas are currently higher than those for immediate “spot” delivery; that is, futures prices are “in contango.” This means that financial markets in which prices are established expect tighter market conditions for both oil and natural gas in 2024.

TXOGA Chart of the Week: U.S. consumer sentiment, spending and GDP growth

Consumer sentiment rebounded entering December

- ▶ How consumers feel about the economy tends to influence their perceived wealth and spending habits, and consumer spending represents about 70% of U.S. GDP on an expenditure basis.
- ▶ As concerns for price inflation have eased and realizations the U.S. is entering a Presidential election year have begun to sink in, the University of Michigan's consumer sentiment index rose by over 13% month-over-month (m/m) to 69.4 in early December from 61.3 in November, offsetting all declines from the prior four months.
- ▶ Based on historical relationships, the improved sentiment suggests relatively healthy consumer spending and GDP growth for Q4 2023 and a solid point of departure for 2024

Consumer sentiment vs. spending



University of Michigan Consumer Sentiment Index
Jumps as Inflation Worries Fade

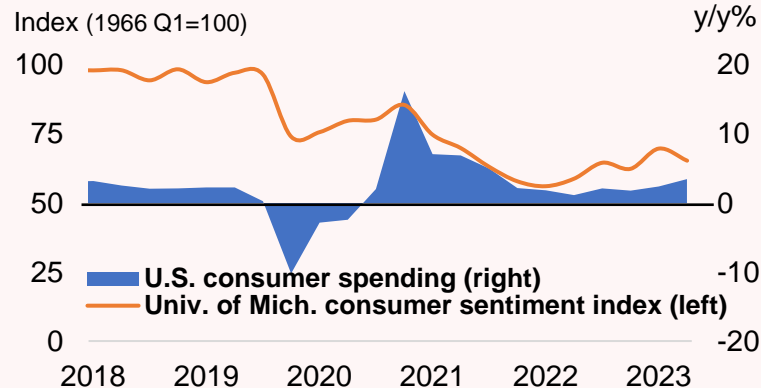
Bloomberg, Dec. 8, 2023

Surprise: Americans are starting to feel better about the
economy and inflation

NBC, Dec. 8, 2023

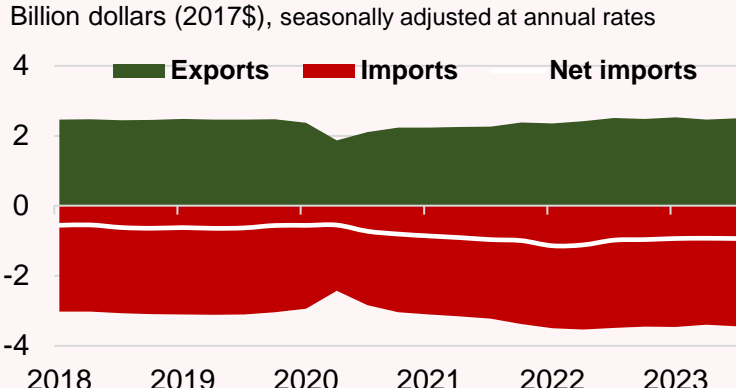
U.S. economic indicators

Consumer sentiment vs. spending



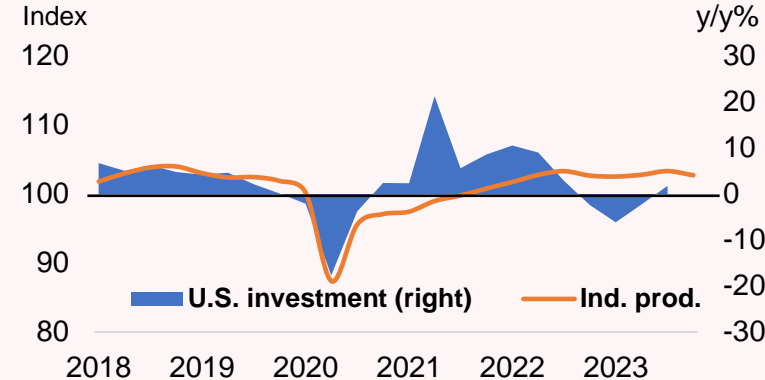
Buoyant consumer sentiment entering December. In its initial reading for December, the Univ. of Michigan consumer sentiment index rose to 69.4 from 61.3 in November. The index remained consistent with consumer spending growth.

Real net exports of goods and services



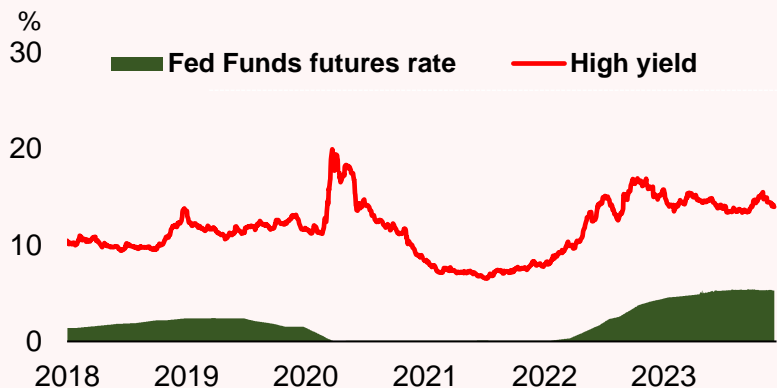
The U.S. trade deficit widened in Q3 2023. The U.S. real trade deficit ran at an annualized rate of \$935 billion in Q3 2023, up from \$927 billion in Q2 per the U.S. Bureau of Economic Analysis. On a nominal basis, the trade surplus for petroleum and products ran at annualized rate of \$29 billion in Q3 2023, down from \$29.5 billion in Q2 2023.

Industrial production and investment growth



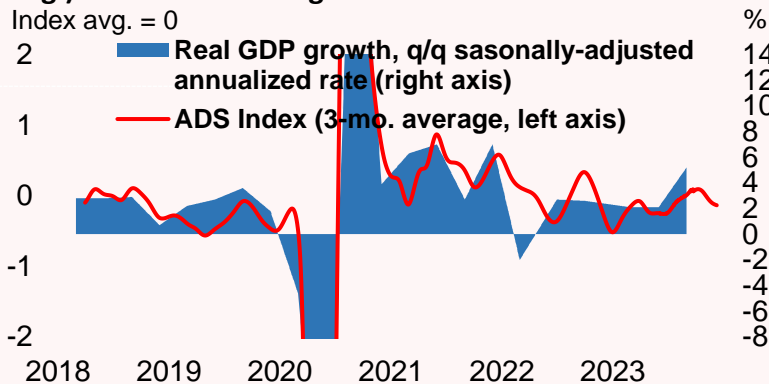
Industrial production has remained consistent with investment growth of 2.25% y/y in Q3 2023, as revised up from an initial reading of 1.8% y/y by the Bureau of Economic Analysis. Although industrial production has remained flat in recent months, in October 2023 it remained up by 1.2% year-to-date.

Fed Funds rate and CCC and lower corporate bond yields



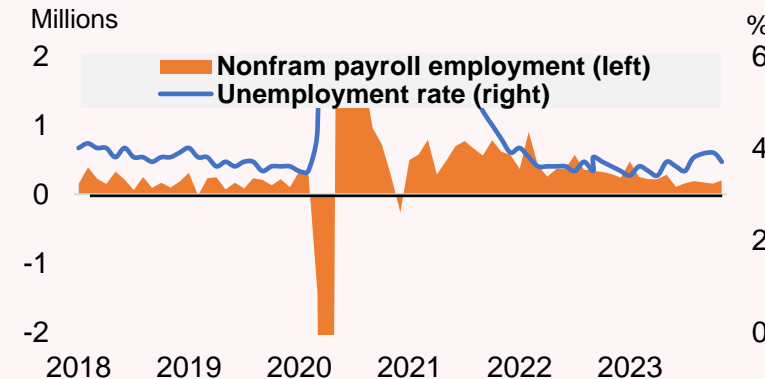
Bond premium for low credit quality fell to its lowest since early Sep. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. For the week ended Dec. 14, HY rates fell to 13.7%, while the Fed Funds futures held steady at 5.3%, resulting in a 23 basis-point (0.23%) w/w drop in the premium for low credit quality.

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



Business conditions consistent with Q4 2023 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 Q3 2023 real GDP and has remained consistent with continued GDP growth in Q4.

Nonfarm payroll employment & unemployment rate

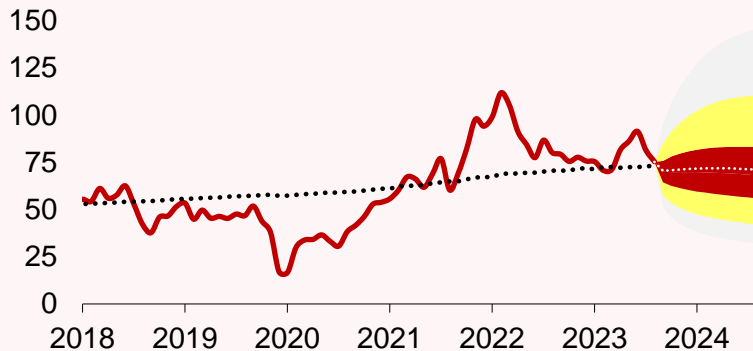


With a rebound in payroll increases, the unemployment rate fell in November. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate fell by 0.2% to 3.7% in November per BLS, while non-farm payrolls rose by 199,000.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

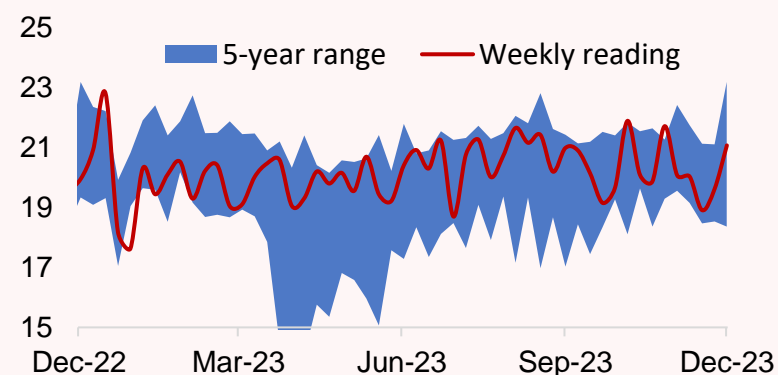
Dollars per barrel (2023\$)



Futures prices fell below the historical mean reversion target. Mean reversion analysis can be useful in to assess short-term market actions. As prices remained around \$72 per barrel for the week ended Dec. 15, the best-fit curve through historical prices (MR target) exceeded the futures price strip, which exceeds spot prices (“contango”). Confidence intervals based on past prices show the potential for greater upside than downside.

U.S. petroleum demand

Million barrels per day (mb/d)



Petroleum demand solid. U.S. petroleum demand, as measured by deliveries, was 21.1 mb/d for the week ended Dec. 8 and rose above the middle of the five-year range.

WTI crude prompt month futures prices

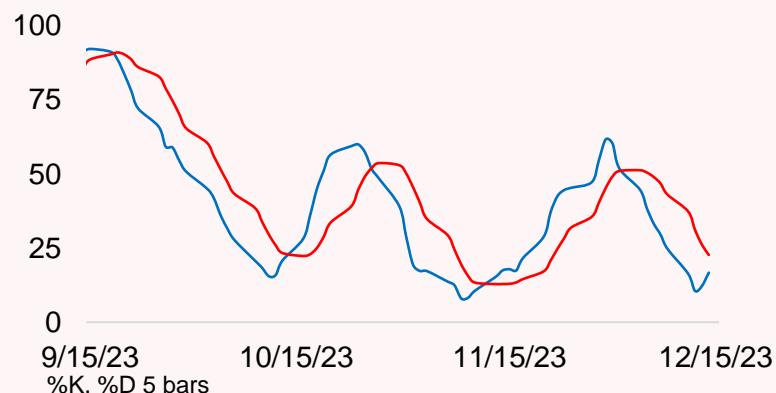
Dollars per barrel



WTI crude oil prices remained nearly \$72 per barrel for the week ended Dec. 15 despite tightened market fundamentals.

WTI crude prompt month futures slow stochastic

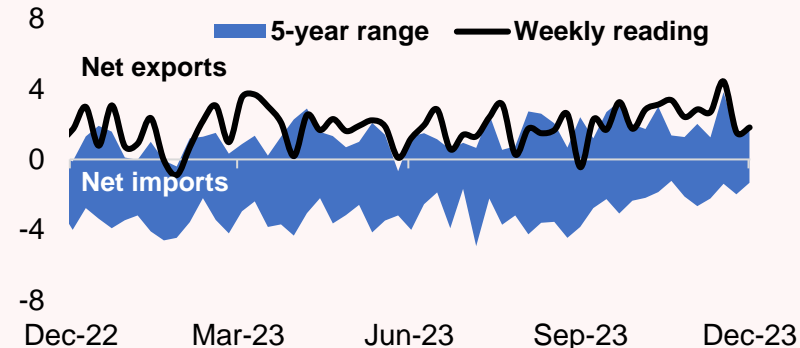
Index level



Price momentum turned decelerated during the week ended Dec. 15.

U.S. petroleum net exports (imports)

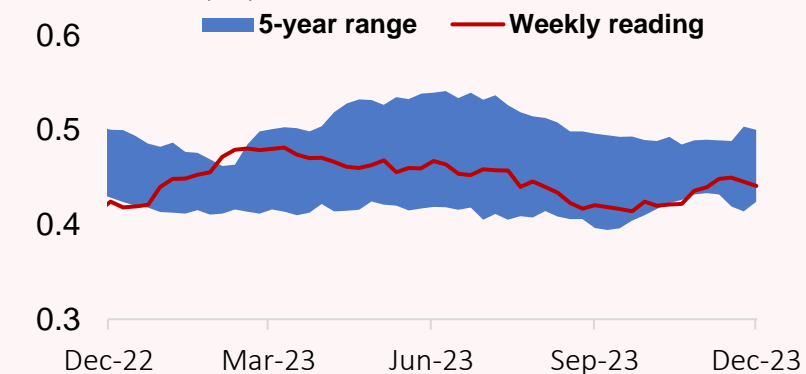
Million barrels per day, mb/d



Petroleum net exports decreased. The U.S. was a petroleum net exporter of 1.8 mb/d for the week ended Dec. 8, up from net exports of 1.5 mb/d in the prior week. The increase was mainly due to lower crude oil net imports.

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

Million barrels (mb)

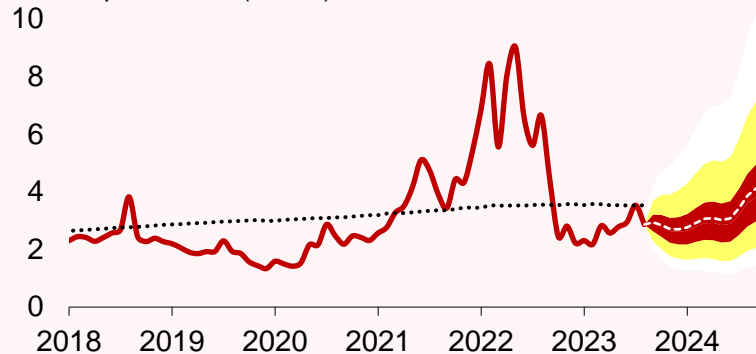


Inventories decreased for the 2nd straight week. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) fell by 4.3 million barrels (mb) for the week ended Dec. 8 and to the bottom fifth of the five-year range.

U.S. natural gas market indicators

Natural gas price mean reversion analysis

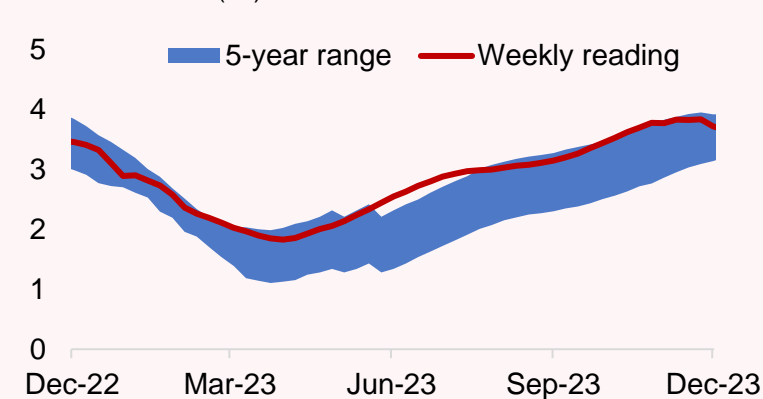
Dollars per mmBtu (2023\$)



Futures prices fell below the historical mean reversion target. Natural gas futures prices fell below their historical mean and exceeded spot prices (“contango”) through next winter. Historical variation continued to show more potential upside than downside.

U.S. weekly working gas storage

Trillion cubic feet (tcf)

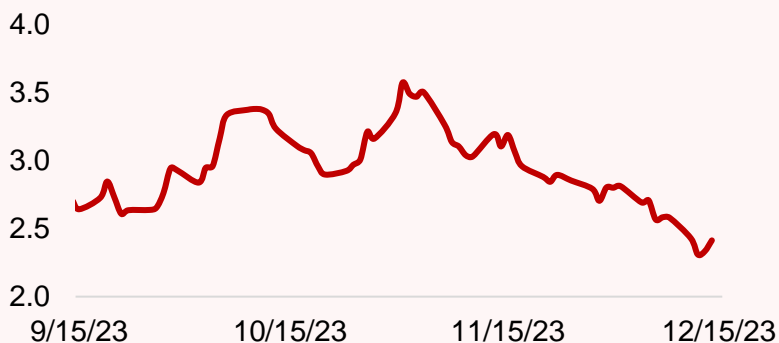


Storage dropped to the 60th percentile within the 5-year range.

Working gas in underground storage (3.6 tcf as of Dec. 8) fell by 1.5% week-over-week as of Dec. 8.

Natural gas prompt month futures prices

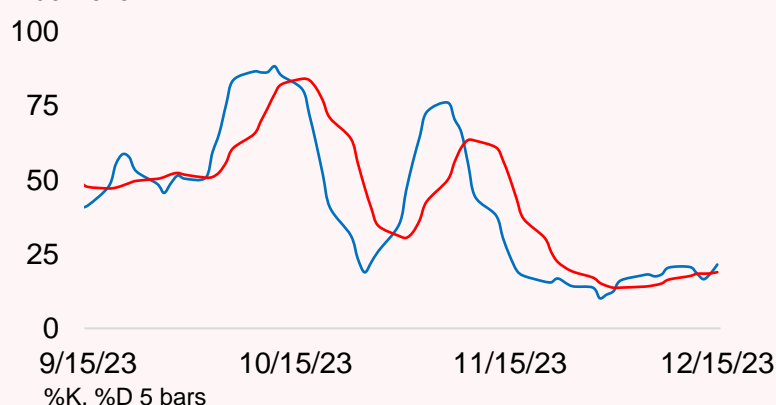
Dollars per million Btu



Natural gas prices at Henry Hub fell to \$2.50 per million Btu for the week ended Dec. 15 to their lowest for this time of year since the 2020 pandemic.

Natural gas futures slow stochastic

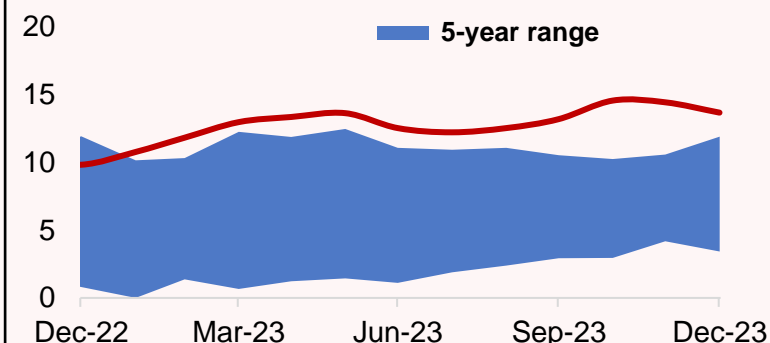
Index level



Natural gas price momentum turned positive during the week ended Dec. 15.

U.S. natural gas net exports

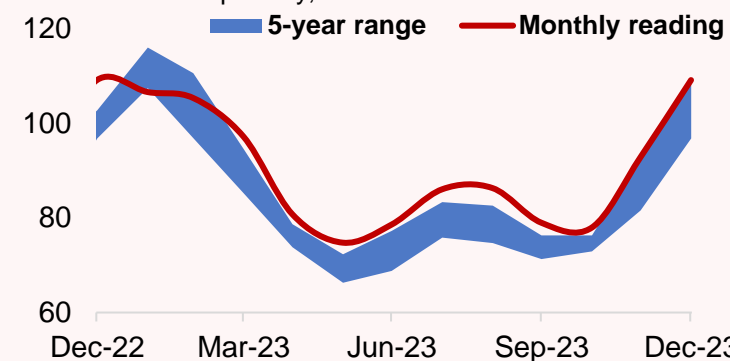
Billion cubic feet per day, bcf/d



Strong net exports. U.S. natural gas net exports are estimated to have averaged 14.4 bcf/d in November but pulled back to 13.7 bcf/d in December per the EIA.

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

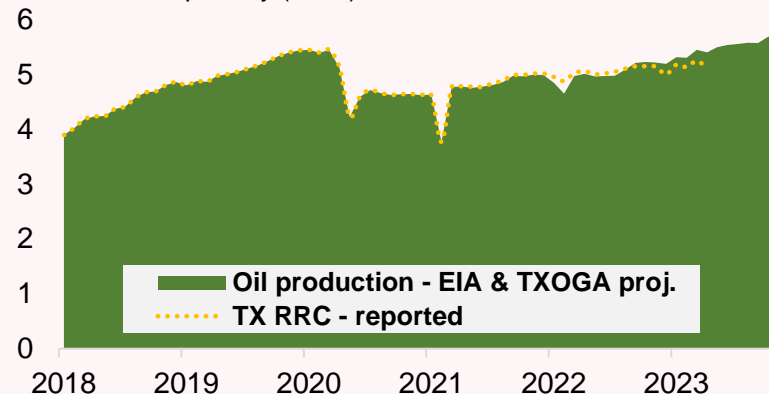


Seasonally strong consumption has continued. Natural gas total consumption through December 2023 has remained at the top of its five-year historical range per the EIA.

Texas' oil and natural gas production

Texas crude oil production, Jan. 2018 – Nov. 2023

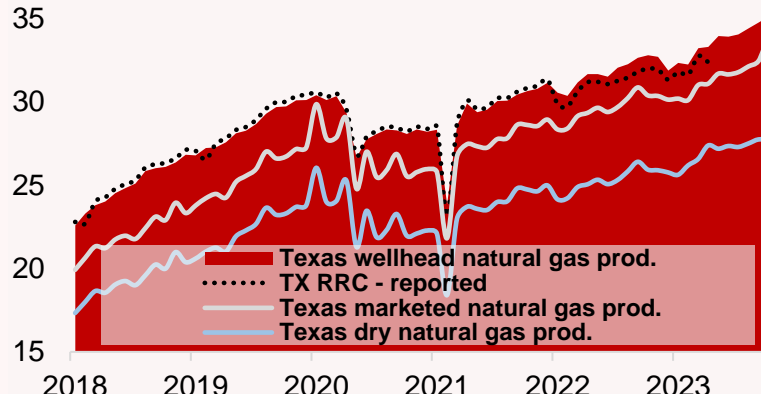
Million barrels per day (mb/d)



Texas' oil production of 5.6 mb/d held steady in September per EIA. TXOGA estimates that Texas crude oil production rose to 5.7 mb/d in October and remained steady in November.

Texas natural gas production, Jan. 2018 – Nov. 2023

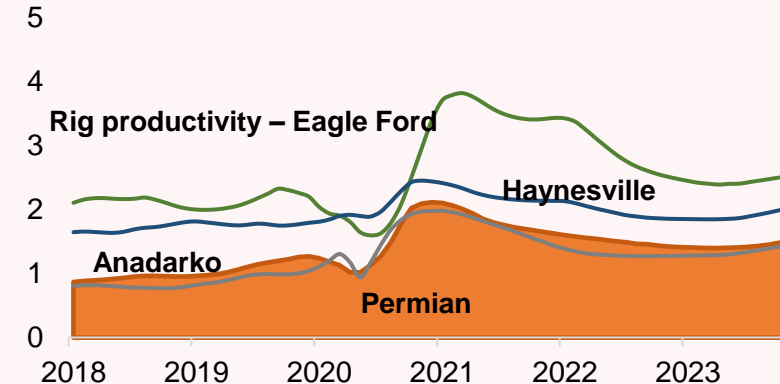
Billion cubic feet per day (bcf/d)



Texas' natural gas production set records in September with 34.8 bcf/d of gross withdrawals and 32.4 bcf/d of marketed production. TXOGA estimates further records that gross withdrawals eclipsed 35 bcf/d in both October and November, and marketed production hit 33.6 bcf/d in October.

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

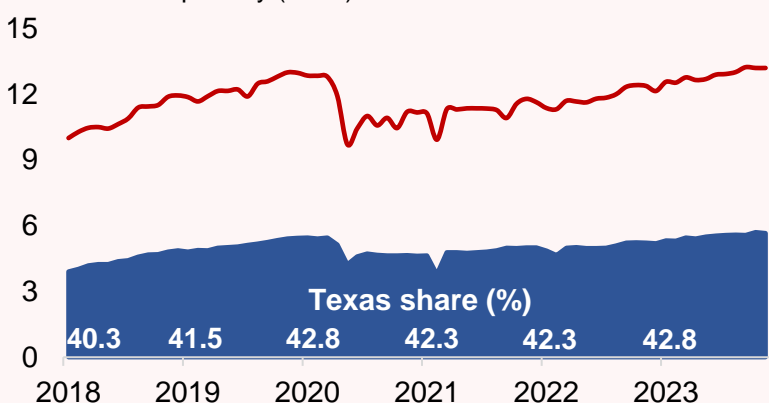
Thousand barrels per day oil-equivalent, kb/doe



EIA estimates of rig productivity for November 2023 show increases year-over-year across all of the major Texas basins, but the strongest productivity gains in the Anadarko (+13.5% y/y), Haynesville (+9.2% y/y), and Permian Basin (+6.2% y/y).

U.S. and Texas crude oil production, Jan. 2018 – Nov. 2023

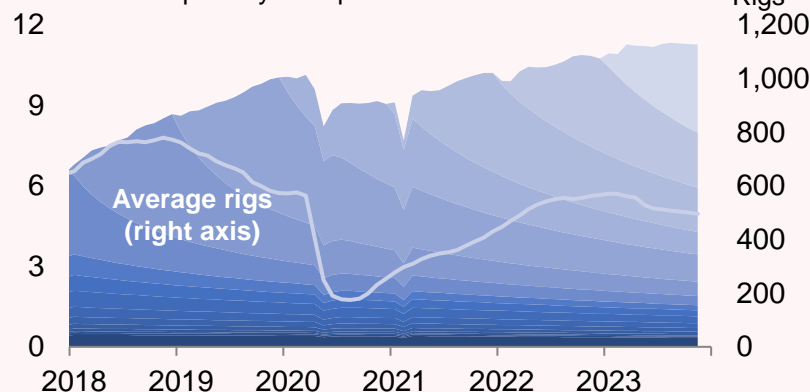
Million barrels per day (mb/d)



Through the first 11 months of the year, Texas accounted for 42.8% of U.S. crude oil production by EIA and TXOGA's estimates.

Texas shale basin wellhead oil & natural gas production

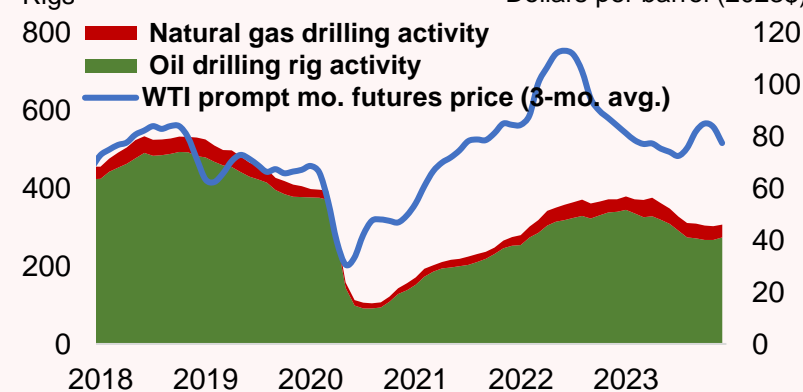
Million barrels per day oil-equivalent



EIA estimates Nov. 2023 production growth across Texas shale basins has been mixed, with strong increases year-over-year in the Permian and Eagle Ford, flat Haynesville production, and decreases in the Anadarko.

Texas drilling activity and WTI crude oil futures prices

Rigs (left axis), Dollars per barrel (2023\$) (right axis)

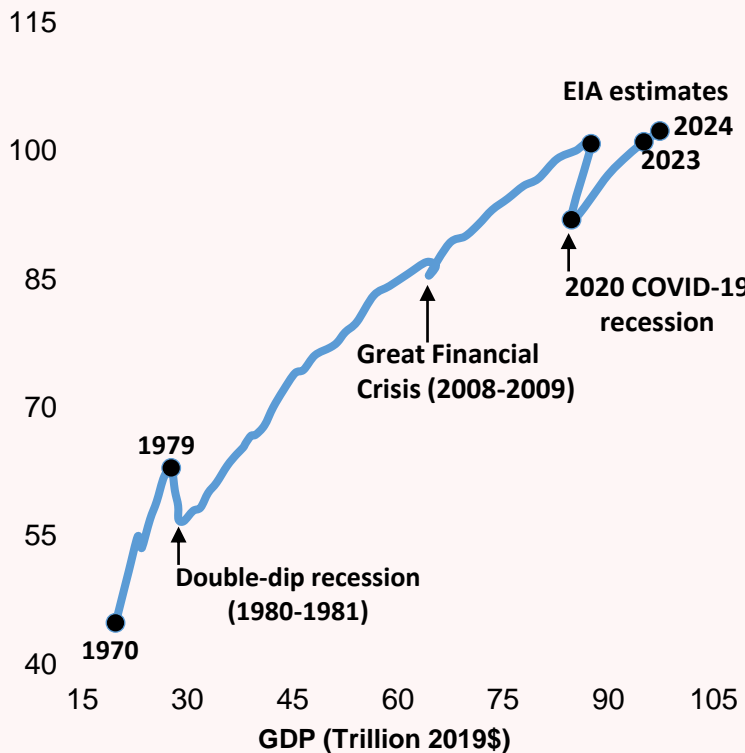


Texas' drilling rig activity rose for the week ended Dec. 8 per Baker Hughes. Texas had 276 oil-directed rigs (up by 4 rigs w/w) and 32 natural gas-directed rigs (down by 2 rigs w/w).

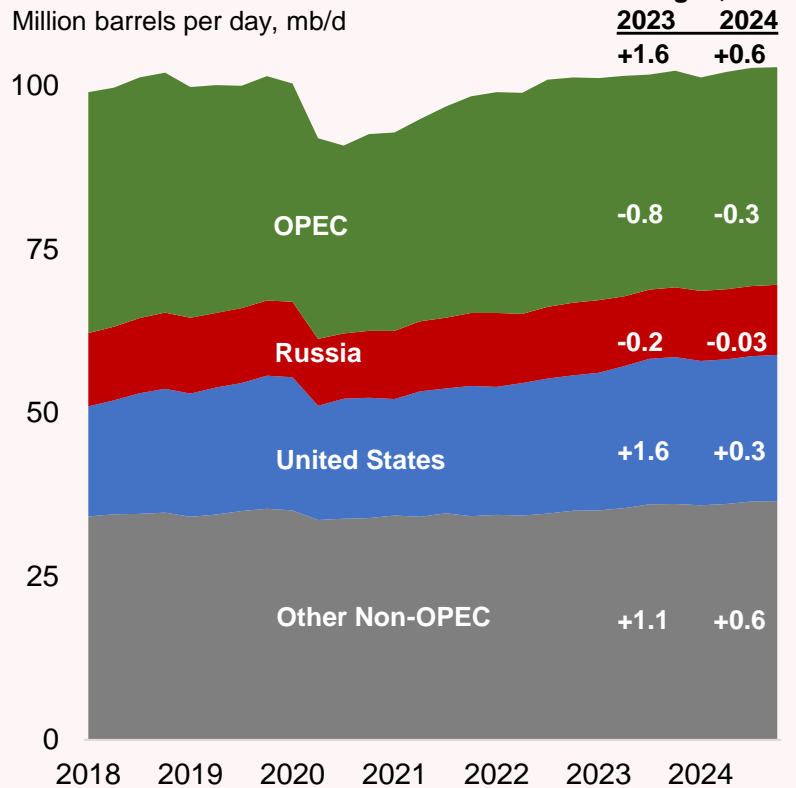
Global oil market balance at-a-glance: EIA estimates for December 2023 show a tight oil market and project Brent at \$82 per barrel in 2024

- ▶ **Record-high demand.** Global oil demand is expected by the EIA rise to 102.3 mb/d in 2024 from a record 101.0 mb/d in 2023.
- ▶ **Supply revisions.** Led by the U.S., global production for 2023 was upgraded by 0.5 mb/d compared with prior estimates, but 2024 supply was lowered by 0.1 mb/d
- ▶ **For oil inventories, the EIA projects U.S. stock withdrawals through year-end 2023 and a global deficit of 0.8 mb/d in Q1 2024, corresponding with Brent crude oil prices of \$82 in 2024, compared with \$77 per barrel currently**

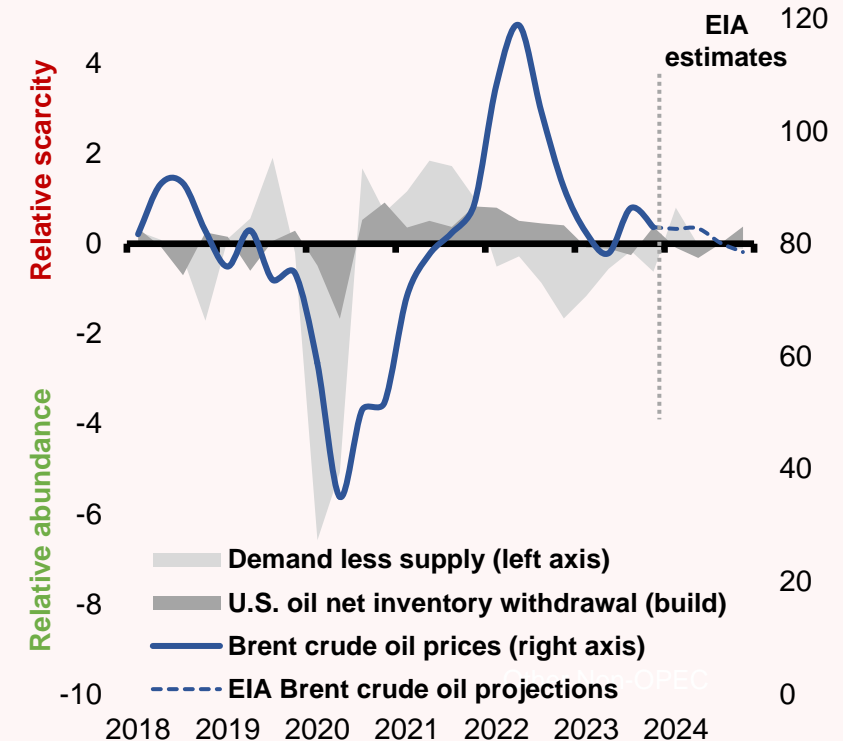
Global oil demand and GDP
Million barrels per day (mb/d)



Oil production by country/region



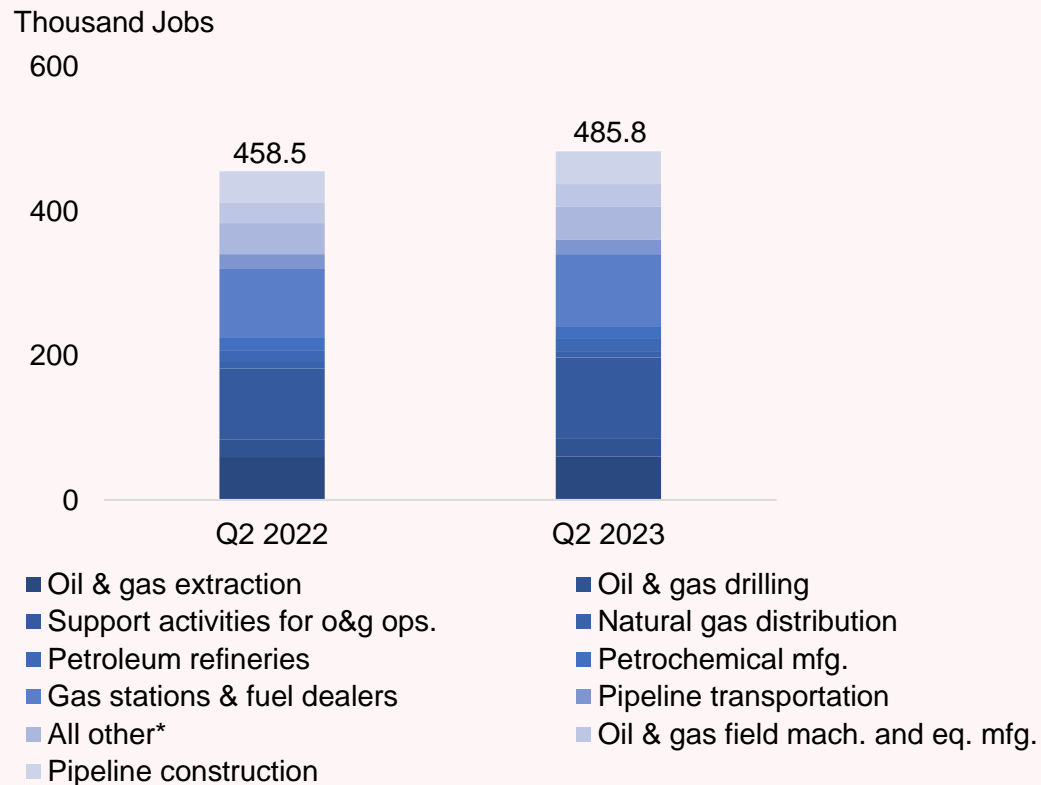
Global demand/supply & Brent prices
Million barrels per day (mb/d) and 2023\$/Bbl



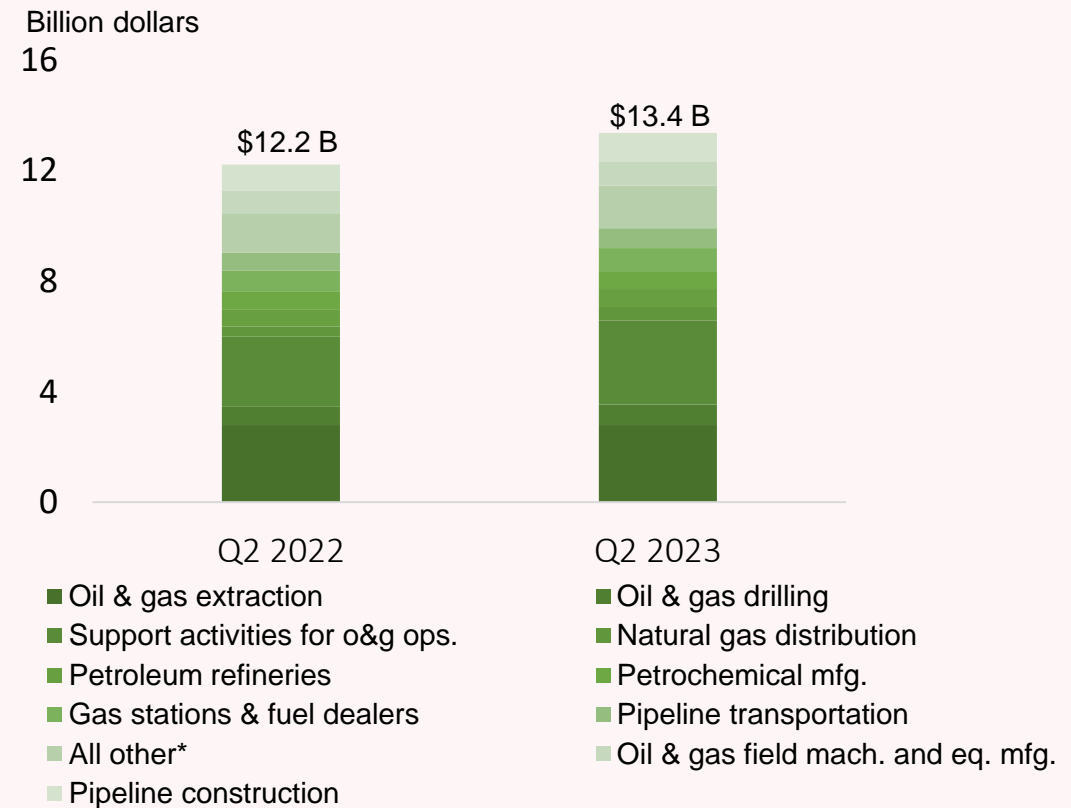
Texas' oil and natural gas industry's jobs and wages rose solidly

- › 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



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



* 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.

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