



January 8, 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 January 8, 2024

- **Solid U.S. economic indicators.** Consumer sentiment in the U.S. has shown improvement according to the University of Michigan's consumer survey for December. Additionally, business conditions and industrial production have remained stable, supported by strong employment data.
- **Oil markets tightened.** The U.S. Energy Information Administration (EIA) reported a significant decrease in U.S. crude oil stocks, which fell by 5.5 million barrels for the week ended Dec. 29 and 18.6 million barrels in December, placing them in the lowest 20% of the five-year range. Petroleum consumption rose, reaching the top 30% of the five-year range, and petroleum net exports have continued at record levels for the season.
- **U.S. natural gas prices increased as storage levels fell.** Prices for U.S. natural gas climbed above \$2.70 per million Btu as of January 5, due to a decrease in storage levels, which have moved down to the median of the five-year range. Prices remain below their historical mean.
- **In 2023, ERCOT set records for natural gas-based and total electricity generation.** As highlighted in the [Chart of the Week](#), a record 200 Terawatt hours (TWh) of electricity was generated from natural gas in the Electricity Reliability Council of Texas (ERCOT) region, with natural gas-based generation constituting 45.1% of the region's total generation, which also hit a record high. Natural gas-based generation in the region has increased and also become more flexible.

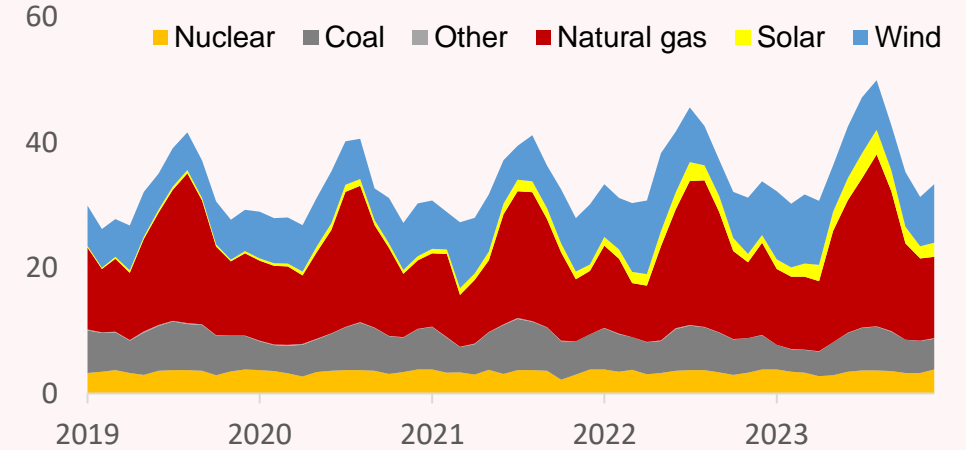
TXOGA Chart of the Week: ERCOT Generation by Fuel

Electric Reliability Council of Texas (ERCOT) Generation by Fuel

- **Record-high natural gas-based and total generation.** In 2023, ERCOT's natural gas-based electricity generation supplied a record high 200 TWh, representing 45.1% of the region's 443 TWh of total generation, which also was a record high.
- **Natural gas-based generation increased while also becoming more flexible.** As ERCOT's wind and solar-based generation has expanded, the flexibility and variability of ERCOT's natural gas-based generation increased. On a monthly average basis, the percentage standard deviation of natural gas (that is, monthly standard deviation of natural gas-based generation by year, divided by the annual average generation) rose to 17.8% in 2023, up by more than 4% compared with each of the past two years.

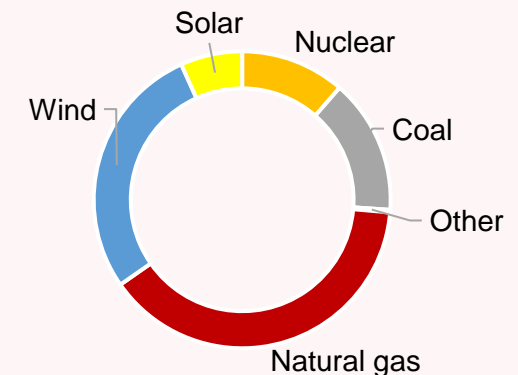
ERCOT Electricity Generation by Fuel

Terawatt-hours (TWh)



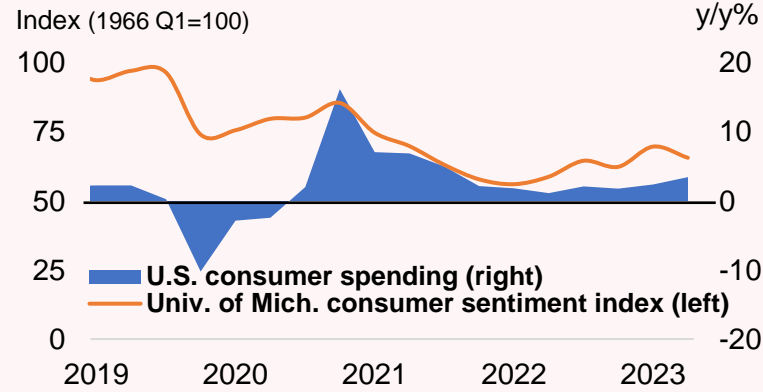
ERCOT Electricity Generation by Fuel in December 2023

33.4 TWh



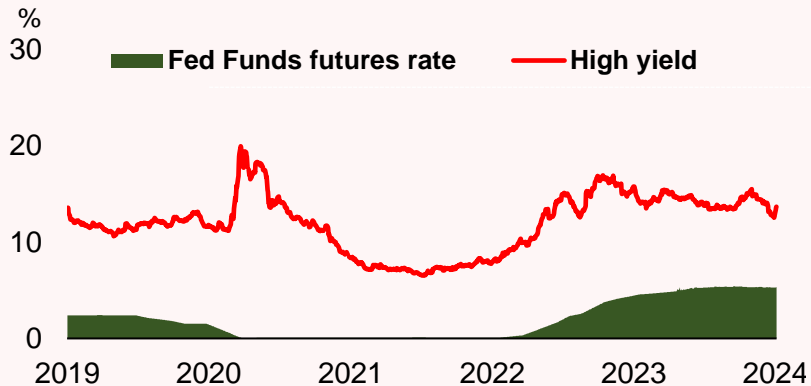
U.S. economic indicators

Consumer sentiment vs. spending



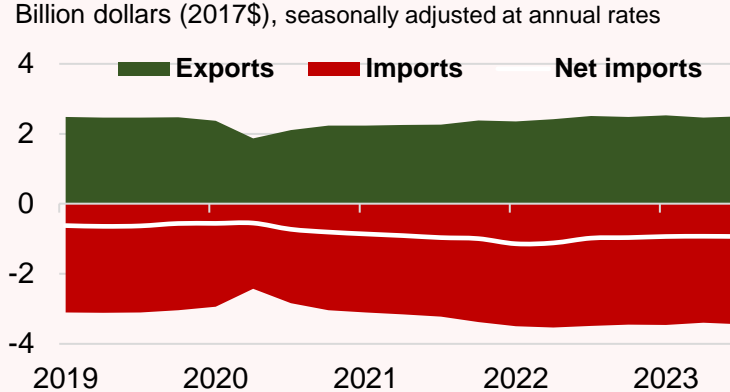
Buoyant consumer sentiment entering December. In its final reading for December, the Univ. of Michigan consumer sentiment index rose to 69.7 from 61.3 in November. The index remained consistent with consumer spending growth.

Fed Funds rate and CCC and lower corporate bond yields



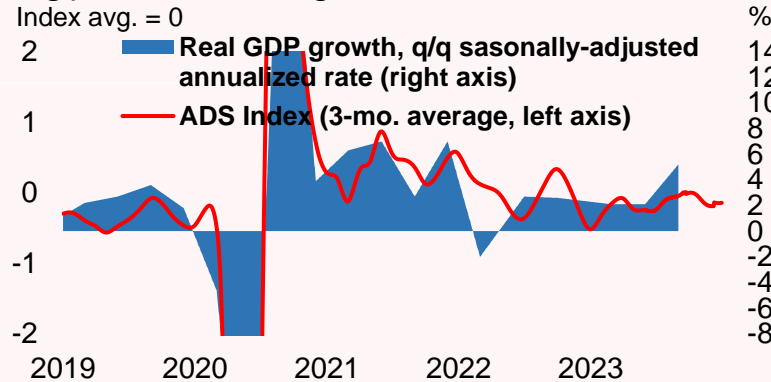
Bond premium for low credit quality increased. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. For the week ended Jan. 5, HY rates rose by 1.1% w/w to 13.7%, while the Fed Funds futures held steady at 5.3%, resulting in a 108 basis-point (1.08%) w/w rise in the premium for low credit quality.

Real net exports of goods and services



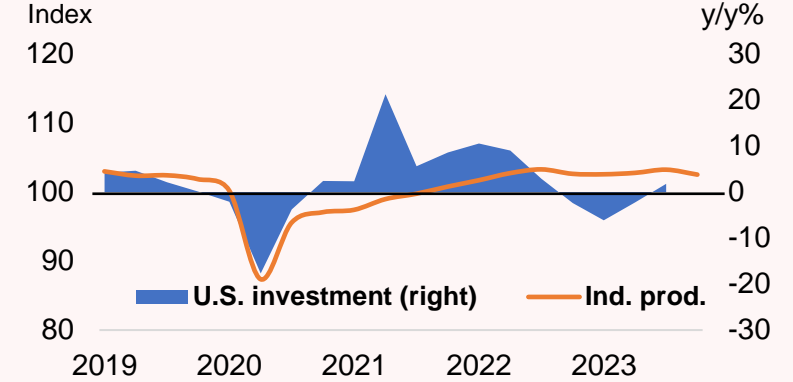
The U.S. trade deficit widened in Q3 2023. The U.S. real trade deficit ran at an annualized rate of \$935 billion in Q3 2023, up from \$927 billion in Q2 per the U.S. Bureau of Economic Analysis. On a nominal basis, the trade surplus for petroleum and products ran at annualized rate of \$29 billion in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

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



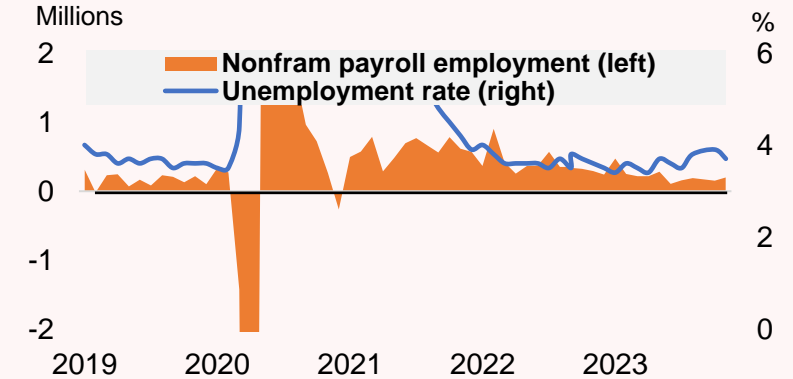
Business conditions consistent with Q4 2023 real GDP growth. The ADS business conditions index, published by the Philadelphia Fed. Res. Bank, is a leading indicator of GDP growth. A rolling 3-month average of the ADS index accurately reflected the increase in Q3 2023 real GDP and has remained consistent with continued GDP growth in Q4.

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. Industrial production has remained flat in recent months, and in November 2023 rose by 0.2% m/m and remained up by 0.1% y/y year-to-date.

Nonfarm payroll employment & unemployment rate

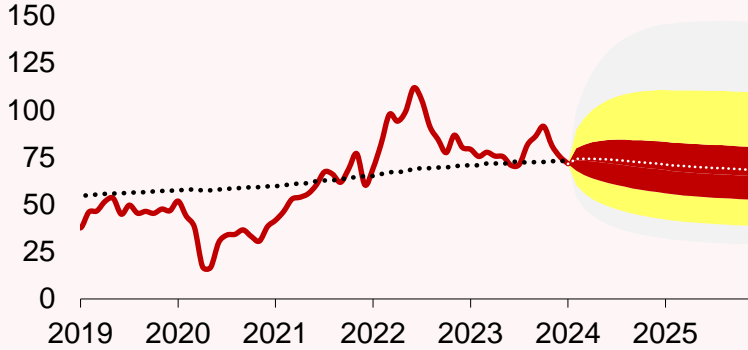


With a rebound in payroll increases, the unemployment rate fell in November. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate fell by 0.2% to 3.7% in November per BLS, while non-farm payrolls rose by 199,000.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

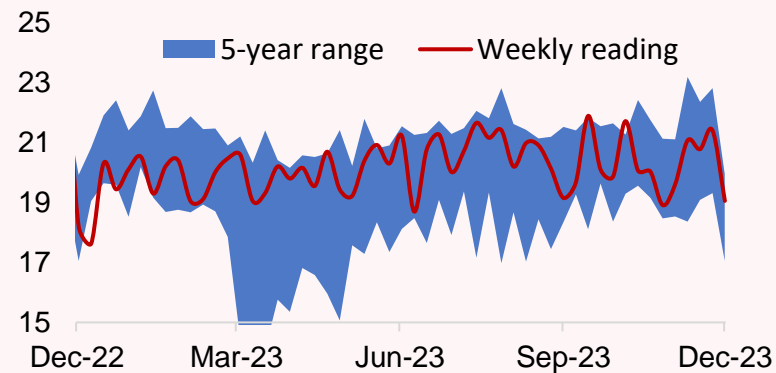
Dollars per barrel (2023\$)



Futures prices aligned the historical mean reversion target. Mean reversion analysis can be useful in to assess short-term market actions. As prices remained around \$73 per barrel for the week ended Jan. 5, the best-fit curve through historical prices (MR target) aligned with the futures price strip. Confidence intervals based on past prices show the potential for greater upside than downside.

U.S. petroleum demand

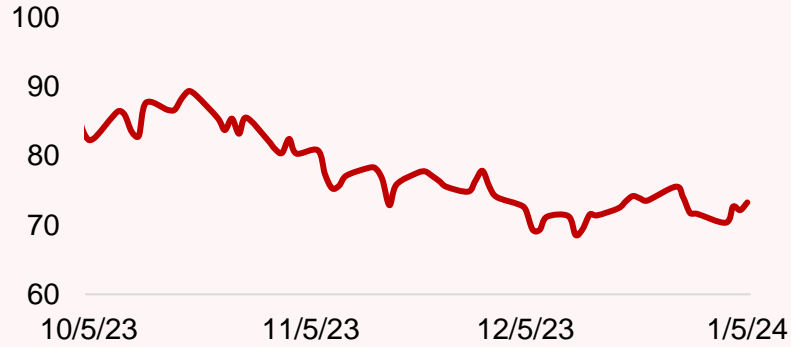
Million barrels per day (mb/d)



Petroleum rose within its historical range. U.S. petroleum demand, as measured by deliveries, was 19.1 mb/d for the week ended Dec. 29 and rose to the top 30% within its five-year range.

WTI crude prompt month futures prices

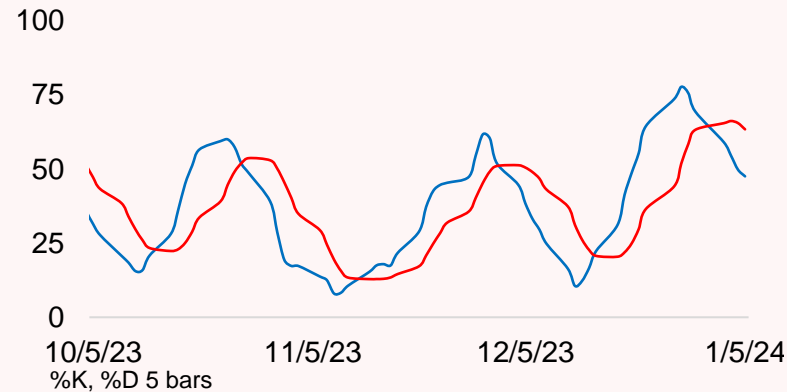
Dollars per barrel



WTI crude oil prices rebounded to \$73 per barrel per barrel for the week ended Jan. 5 as market fundamentals tightened.

WTI crude prompt month futures slow stochastic

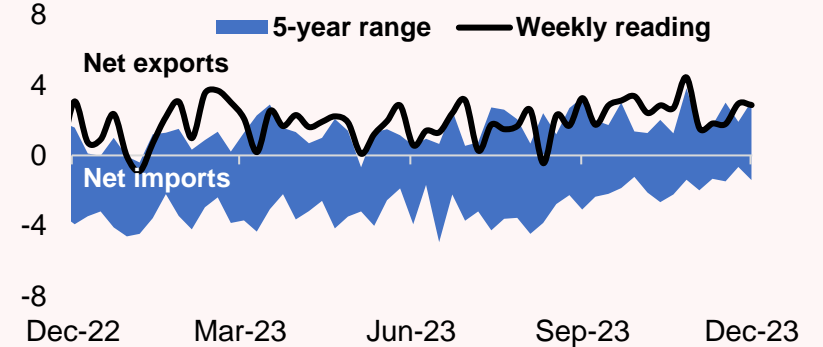
Index level



Price momentum rose in late December but slowed for the week ended Jan. 5.

U.S. petroleum net exports (imports)

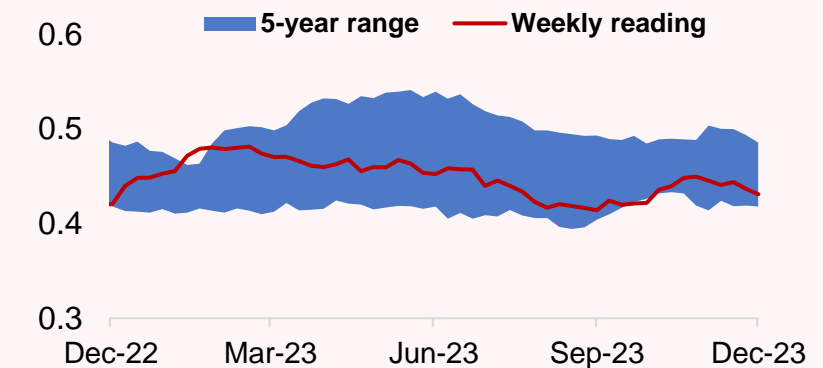
Million barrels per day, mb/d



Petroleum net exports decreased. The U.S. was a petroleum net exporter of 2.9 mb/d for the week ended Dec. 29 and averaged nearly 2.0 mb/d in 2023, the highest annual petroleum net exports on record per the EIA.

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

Million barrels (mb)

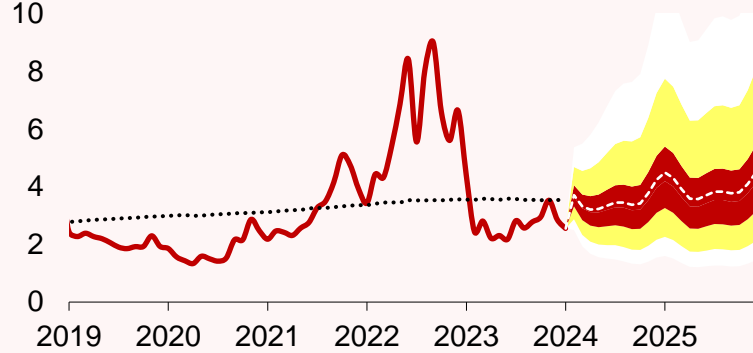


Inventories fell in four of the past five weeks. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) fell by 5.5 million barrels (mb) for the week ended Dec. 29 and by 18.6 mb month-to-date to their lowest 20% within the five-year range.

U.S. natural gas market indicators

Natural gas price mean reversion analysis

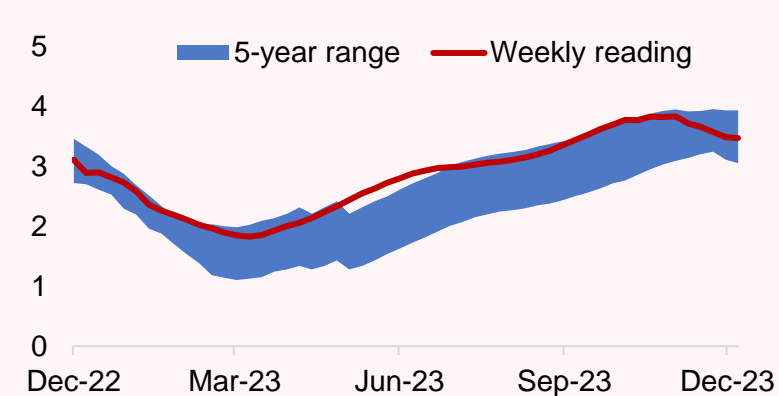
Dollars per mmBtu (2023\$)



Natural gas prices remained below the historical mean reversion target. Natural gas prices of around \$2.70 per million Btu remained below their historical mean. Historical variation continued to show more potential upside than downside.

U.S. weekly working gas storage

Trillion cubic feet (tcf)



Storage dropped to the middle of the 5-year range. Working gas in underground storage (3.5 tcf as of Dec. 29) fell by 0.4% week-over-week as of Dec. 29 to the median of its 5-year range.

Natural gas prompt month futures prices

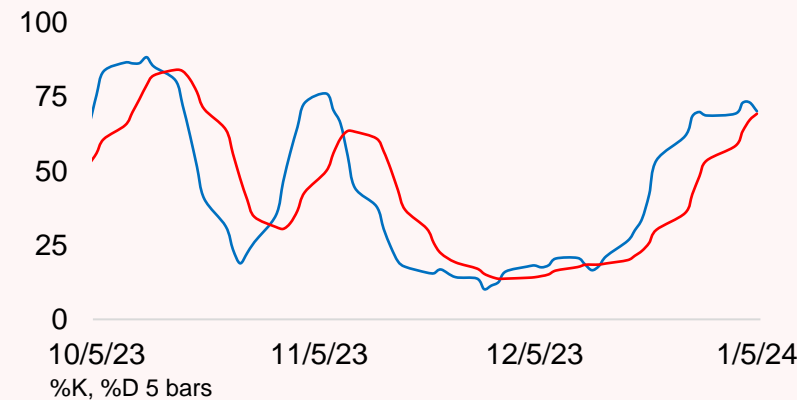
Dollars per million Btu



Natural gas prices at Henry Hub rose to over \$2.70 per million Btu for the week ended Jan. 5 as storage levels fell.

Natural gas futures slow stochastic

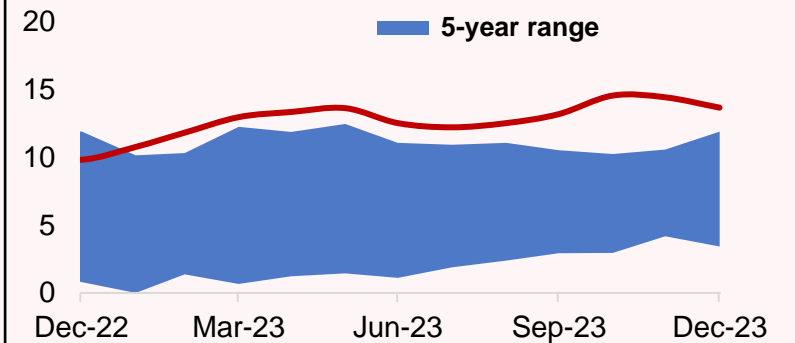
Index level



Natural gas price momentum turned rose in late December but slowed during the week ended Jan. 5.

U.S. natural gas net exports

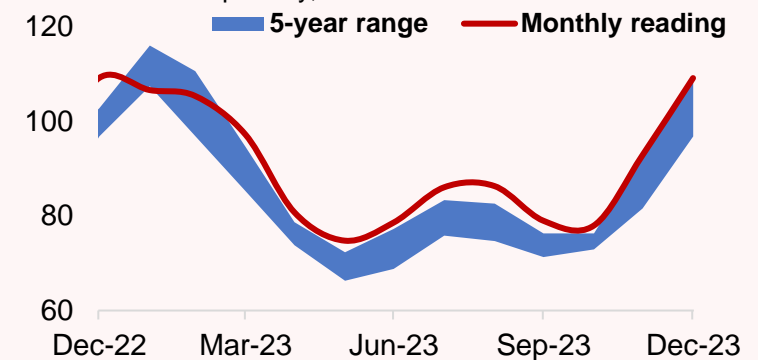
Billion cubic feet per day, bcf/d



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

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

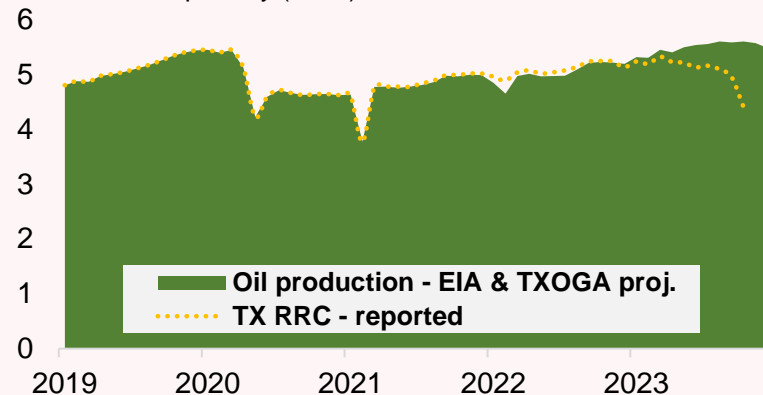


Seasonally strong consumption has continued. Natural gas total consumption through December 2023 has remained at the top of its five-year historical range per the EIA.

Texas' oil and natural gas production

Texas crude oil production, Jan. 2019 – Dec. 2023

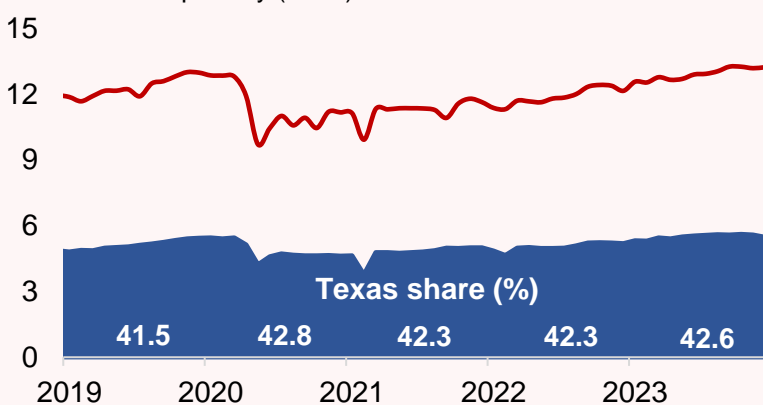
Million barrels per day (mb/d)



Strong production. Texas' oil production of 5.6 mb/d held steady in October per the EIA. TXOGA estimates that Texas crude oil production held at 5.6 mb/d in November and edged down to 5.5 mb/d in December.

U.S. and Texas crude oil production, Jan. 2019 – Dec. 2023

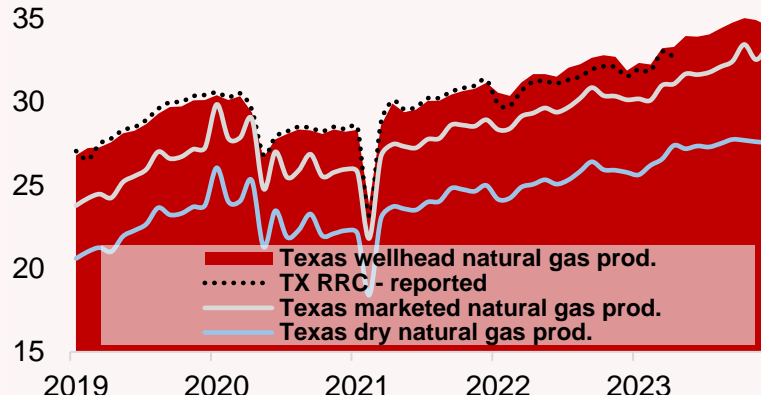
Million barrels per day (mb/d)



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 natural gas production, Jan. 2019 – Dec. 2023

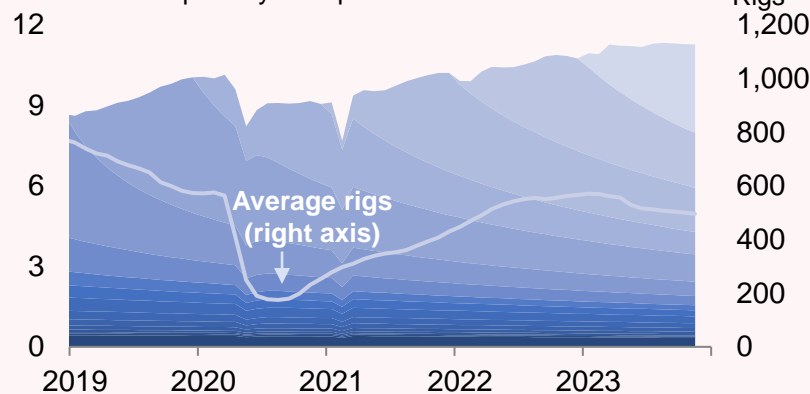
Billion cubic feet per day (bcf/d)



Record production in October. Texas' natural gas production set records for 35.0 bcf/d of gross withdrawals and 33.5 bcf/d of marketed production in October per EIA. TXOGA estimates that natural gas production eased through December to 34.6 bcf/d of gross withdrawals, 33.3 bcf/d of marketed production, and 27 bcf/d of dry gas production.

Texas shale basin wellhead oil & natural gas production

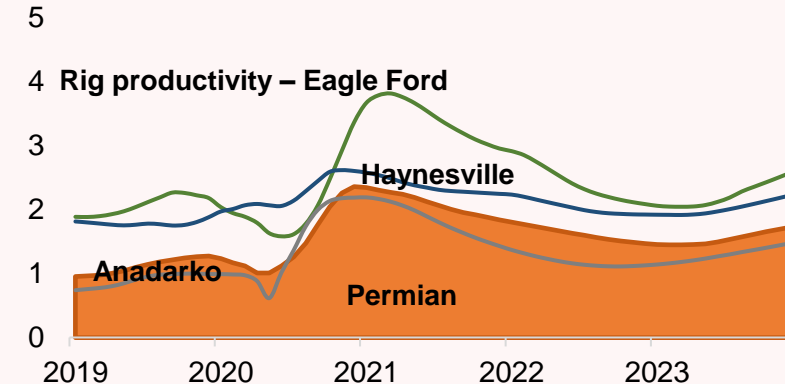
Million barrels per day oil-equivalent



EIA estimates Dec. 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 rig productivity by basin – new monthly prod. per rig

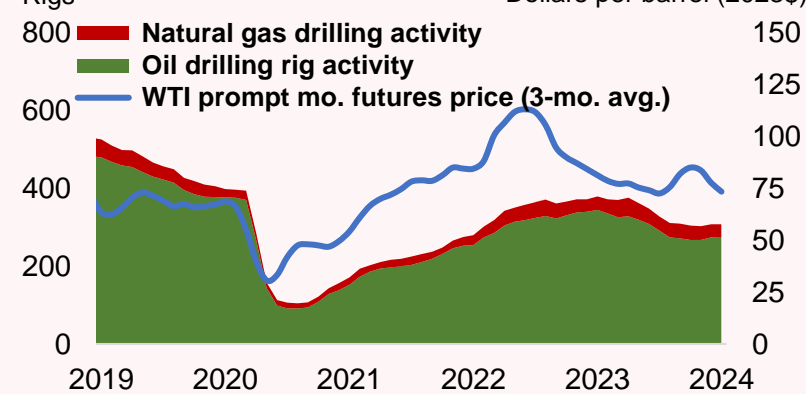
Thousand barrels per day oil-equivalent, kb/dae



Strong productivity. EIA estimates of rig productivity for December 2023 show increases year-over-year across the major Texas basins, including the Anadarko (+30.6% y/y), Eagle Ford (+23.3% y/y), Haynesville (+15.6% y/y), and Permian (+17.4% y/y).

Texas drilling activity and WTI crude oil futures prices

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

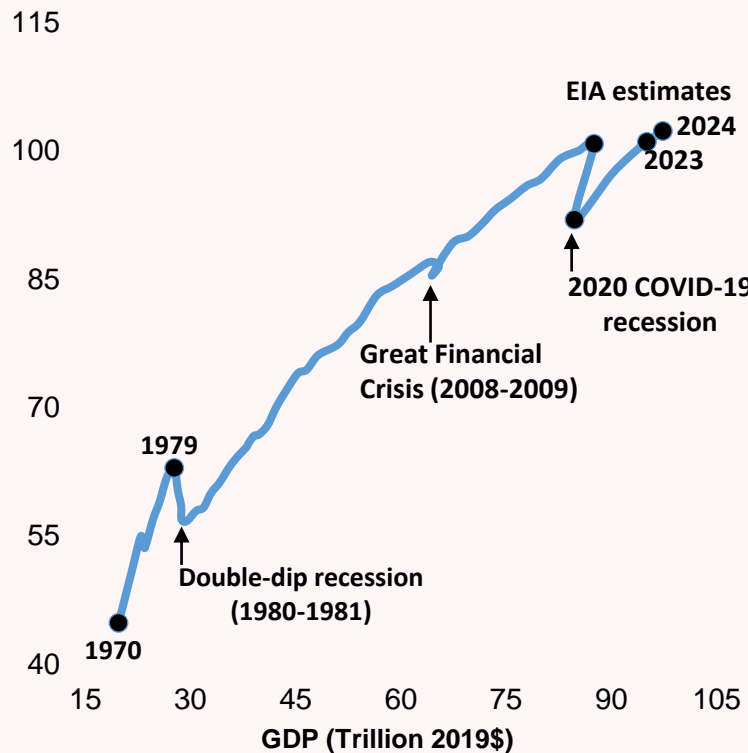


Texas' drilling rig activity slipped for the week ended Jan. 5 per Baker Hughes. Texas had 274 oil-directed rigs (unchanged w/w) and 34 natural gas-directed rigs (down by 1 rig w/w).

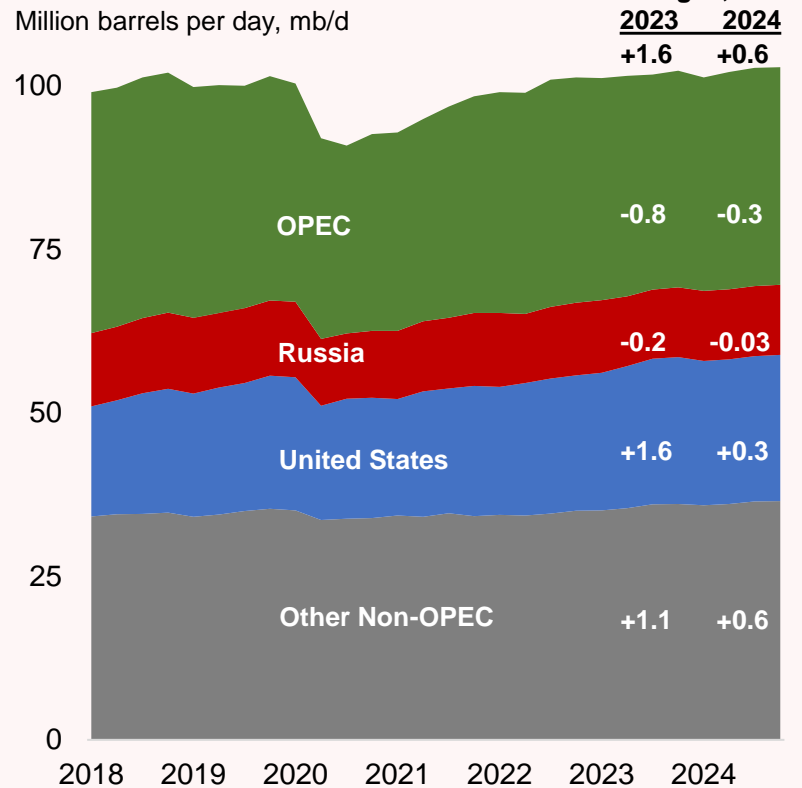
Global oil market balance at-a-glance: EIA estimates for December 2023 show a tight oil market and project Brent at \$82 per barrel in 2024

- ▶ **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**

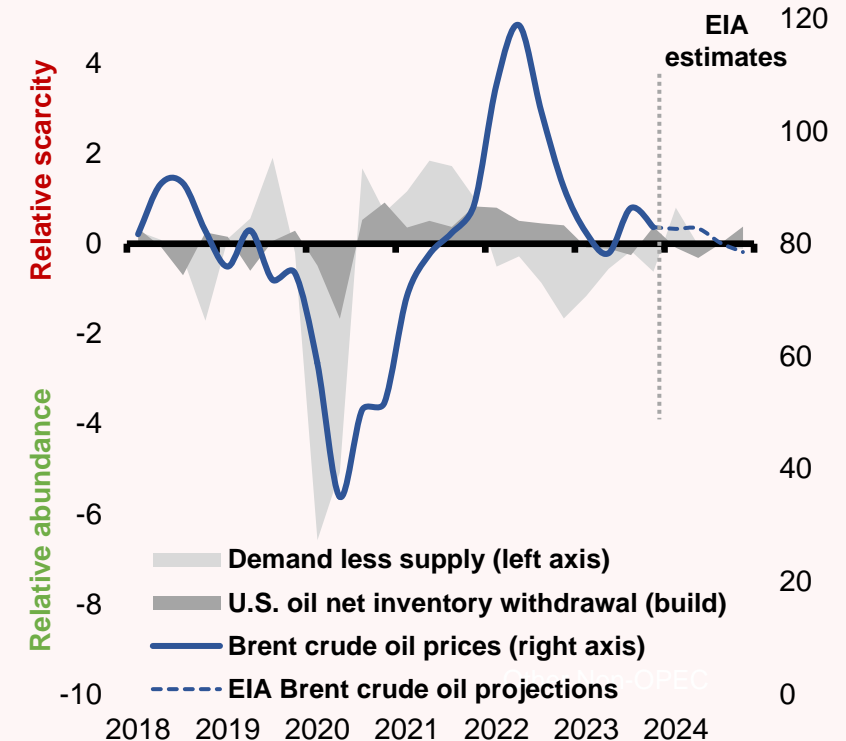
Global oil demand and GDP
Million barrels per day (mb/d)



Oil production by country/region



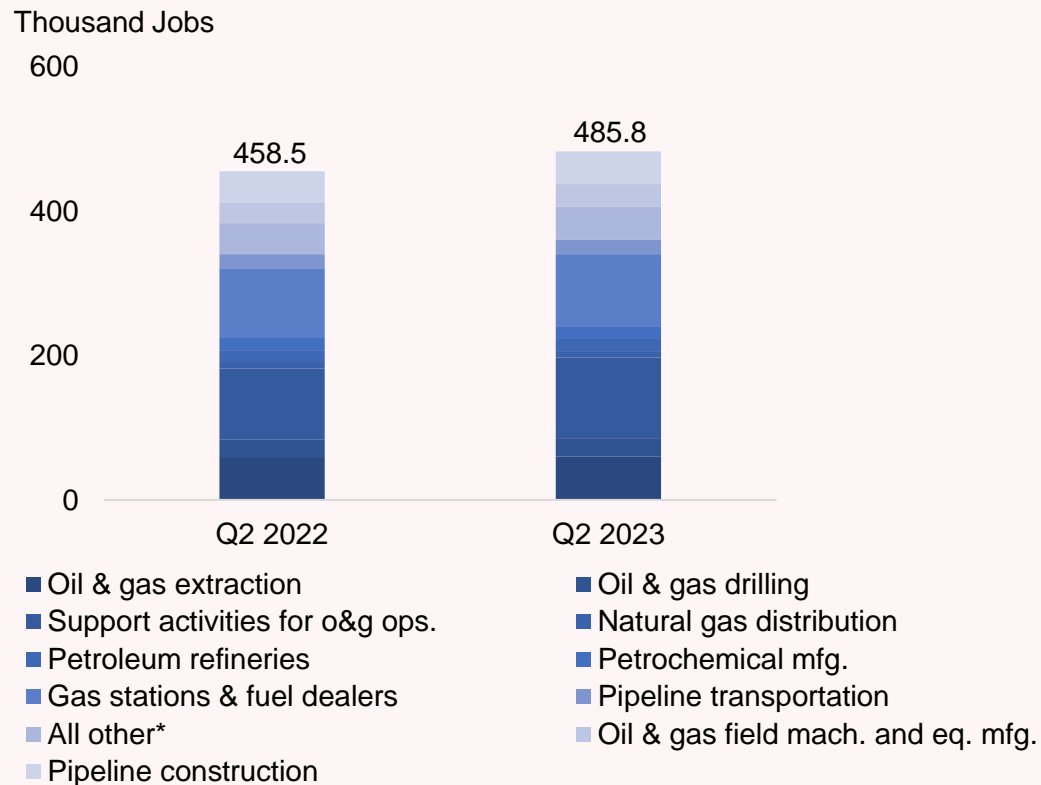
Global demand/supply & Brent prices
Million barrels per day (mb/d)



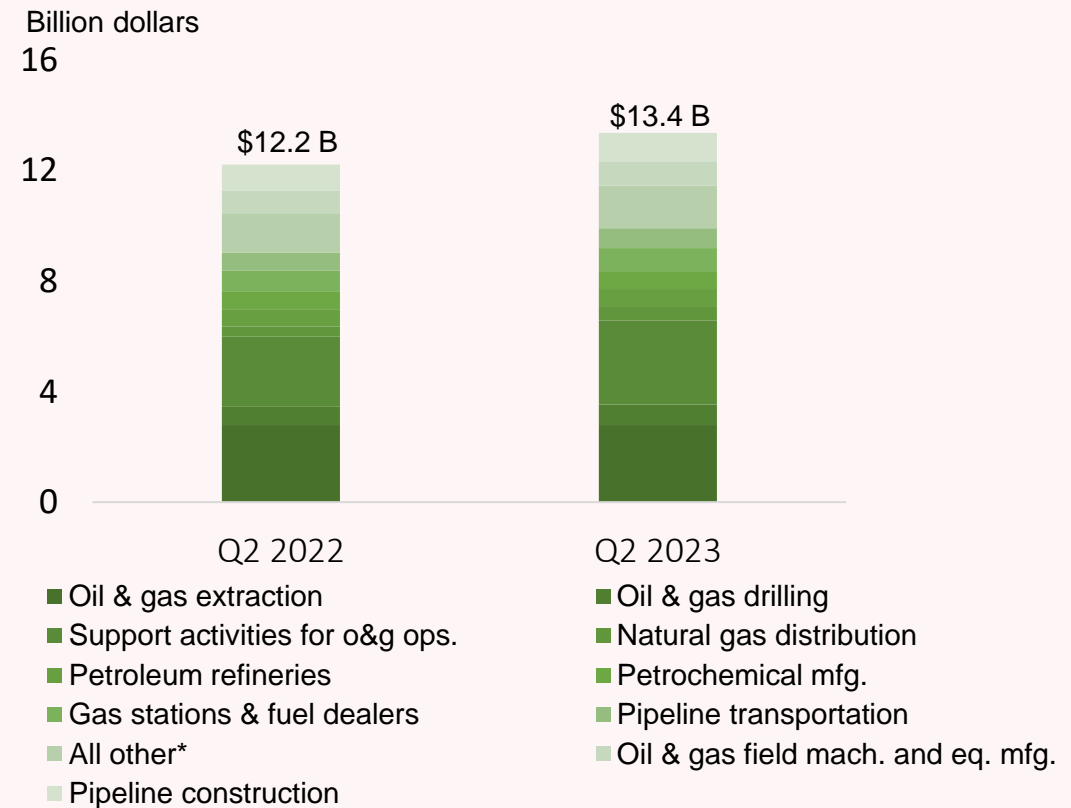
Texas' oil and natural gas industry's jobs and wages rose solidly

- › 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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