



November 13, 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 November 13, 2023

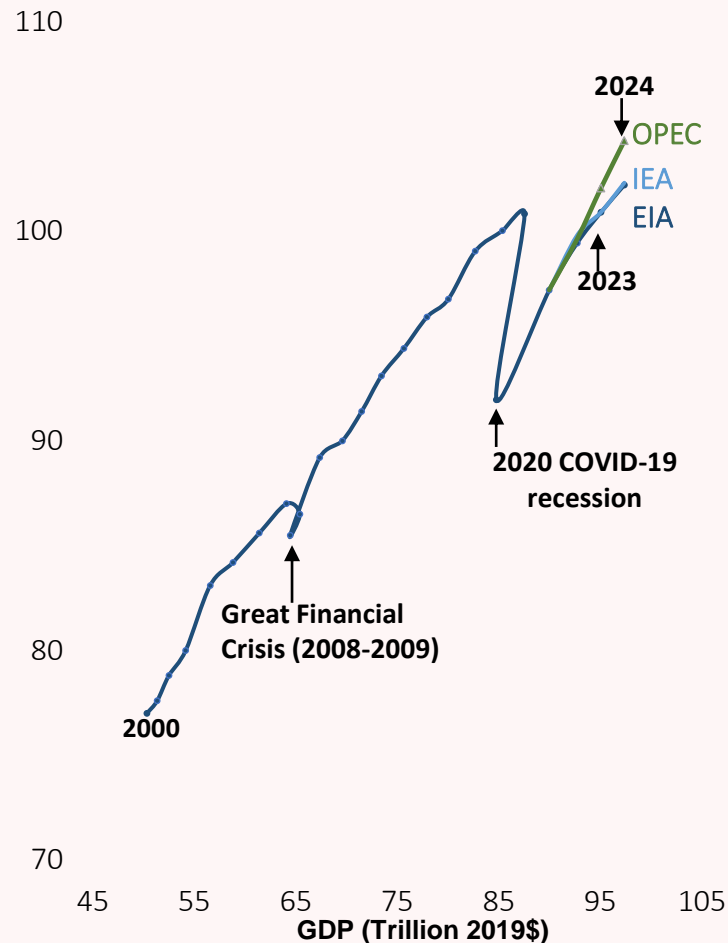
- **Mixed economic indicators.** The ADS business conditions index from the Philadelphia Federal Reserve Bank showed continued positive business conditions conducive to GDP growth, and the yield premium for sub-investment grade corporate bonds declined to under 10%. Contrarily, the University of Michigan's early November consumer survey showed a weakening of consumer sentiment, mainly due to concerns over high interest rates.
- **Oil markets projected to tighten in 2024.** As highlighted in the [Chart of the Week](#), the U.S. Energy Information Administration (EIA), International Energy Agency (IEA), and OPEC each project record highs for global oil demand in 2024. However, there is a disparity in growth forecasts, ranging from 1.3 million barrels per day (mb/d) to 2.3 mb/d. The EIA's November outlook revised upwards the 2024 global oil demand forecast while reducing the supply estimate for the same period. Despite higher demand projections, EIA's figures still fall below those of the IEA and OPEC.
- **Decline in U.S natural gas prices amid strong storage levels.** For the week ended November 10, U.S. natural gas prices dropped by over 13% week-over-week (w/w), nearing \$3.00 per million British thermal unit (Btu). October 2023 saw U.S. natural gas net exports hit a record high of 14.6 billion cubic feet per day (bcf/d), according to EIA data. Domestic consumption has continued near the top of its five-year range. Nevertheless, domestic prices have remained historically low, supported by strong production (104.6 bcf/d of dry natural gas for the week ended November 8 per EIA) and significant storage levels.

TXOGA Chart of the Week: Global Oil Markets Per EIA's Short-Term Energy Outlook (STEO)

- The U.S. Energy Information Administration (EIA), International Energy Agency (IEA), and OPEC agree that global oil demand could reach record highs in 2024, but disagree on the extent of growth, ranging from 1.3 mb/d to 2.3 mb/d.
- In their November 2023 outlook, EIA increased their estimate of 2024 global oil demand but lowered their estimate of supply growth next year. Despite the increased demand projections, EIA's estimates remained below those of the IEA and OPEC.
- Notably, compared with EIA estimates for 2024 issued earlier this year, the global supply outlook has dropped by 1.0 mb/d, which shows a tighter market balance despite broad expectations for slower economic growth next year.

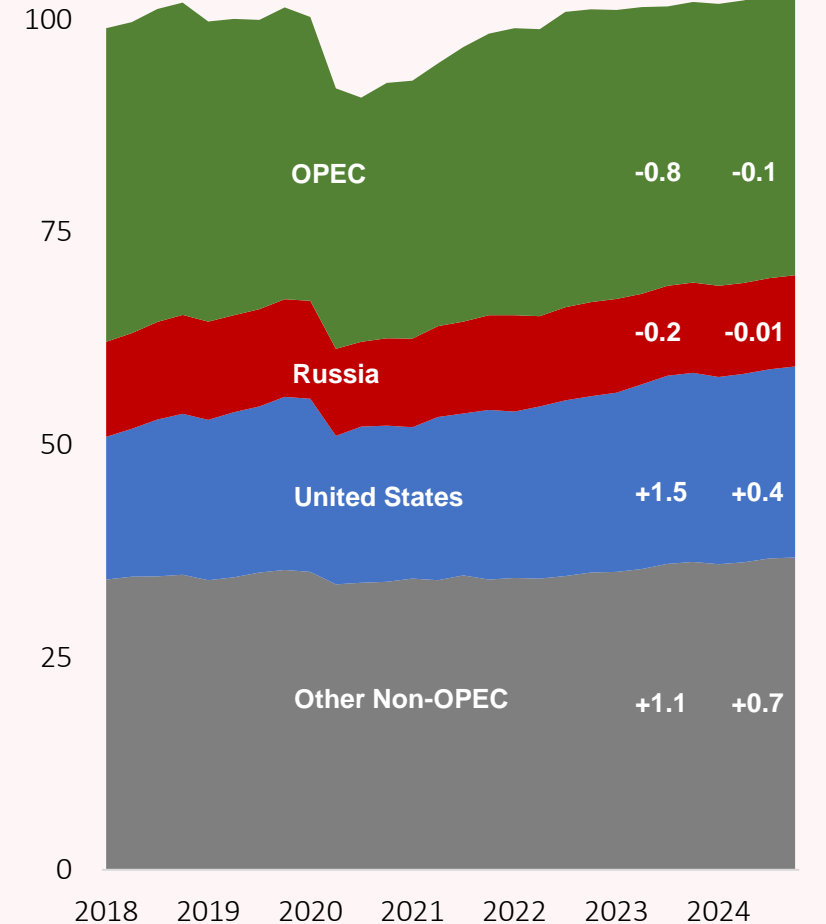
Global oil demand and GDP

Million barrels per day (mb/d)



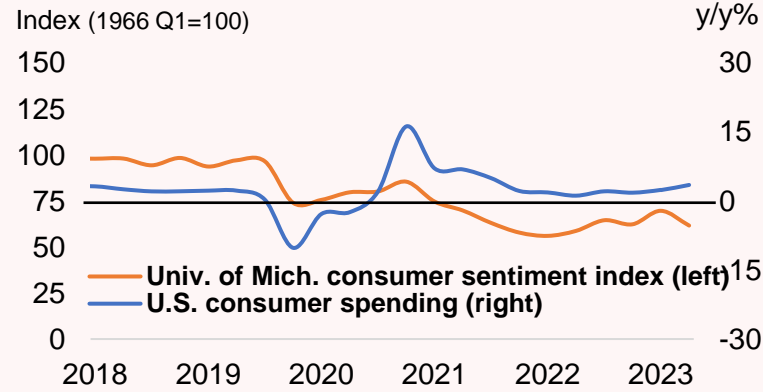
Oil production by country/region

Million barrels per day, mb/d



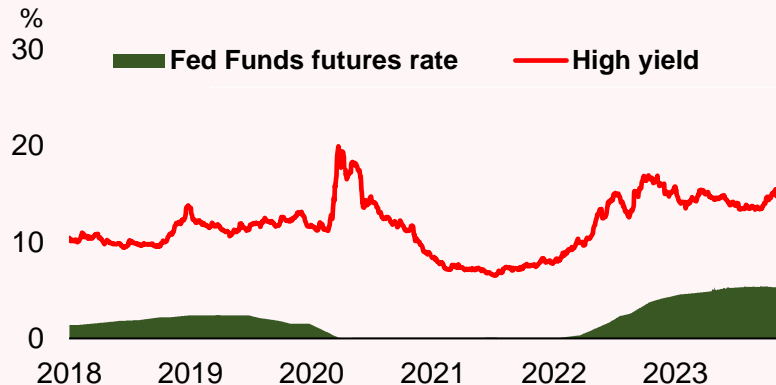
U.S. economic indicators

Consumer sentiment vs. spending



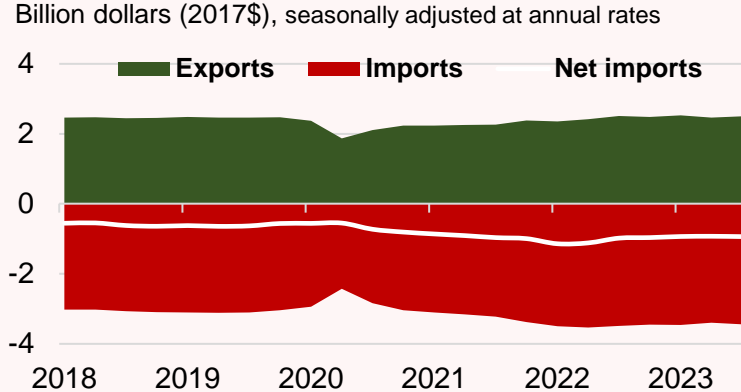
Consumer sentiment weakened entering November. In its initial reading for November, the Univ. of Michigan consumer sentiment index fell for a fourth straight month, mainly due to concerns about the negative effects of high interest rates. The index has nevertheless remained consistent with slow consumer spending growth.

Fed Funds rate and CCC and lower corporate bond yields



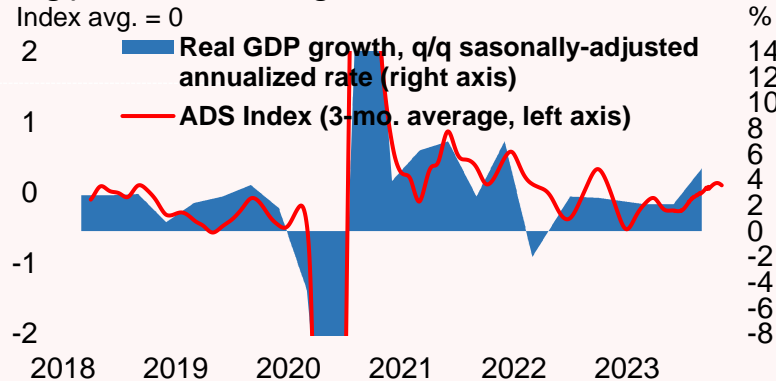
Low credit quality premium fell. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. HY rates fell by 60 basis points (bps) between Nov. 1 and 9, while the Fed Funds futures rate remained stable near 5.3%. The premium for low credit quality decreased to 9.55% as of Nov. 9.

Real net exports of goods and services



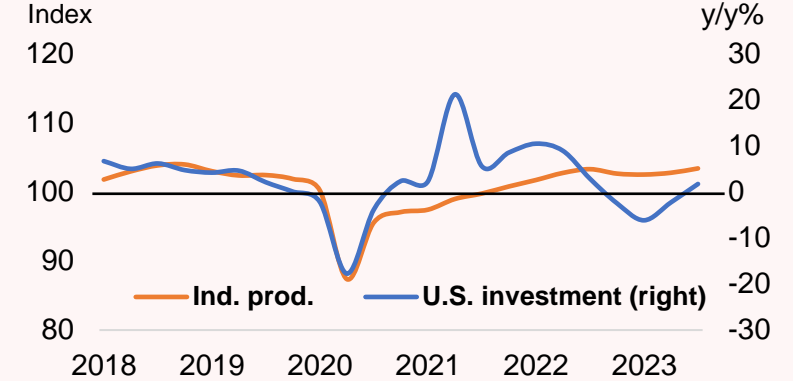
The U.S. trade deficit widened in Q3 2023. The U.S. real trade deficit ran at an annualized rate of \$938 billion in Q3 2023, per the U.S. Bureau of Economic Analysis. Petroleum and product exports of \$185 billion were partially offset by imports of \$167 billion for net surplus of \$18 billion for Q3 on an annualized basis, down \$25.4 billion in the same quarter a year ago.

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



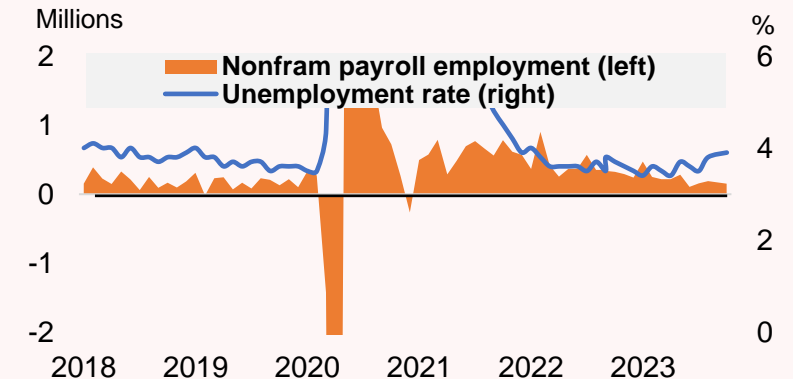
Stable growth conditions. The ADS business conditions index, published by the Philadelphia Fed. Res. Bank, is a leading indicator of GDP growth. A rolling 3-month average of the ADS index has remained solid with positive readings so far in Q4 2023, which historically corresponds with continued GDP growth.

Industrial production and investment growth



Investment resumed growth of 1.8% y/y in Q3 2023 in the initial reading of Q3 2023 GDP by the Bureau of Economic Analysis. This growth was consistent with changes in industrial production, which grew by 0.1% y/y in Sep. along with a capacity utilization rate of 79.7%.

Nonfarm payroll employment & unemployment rate

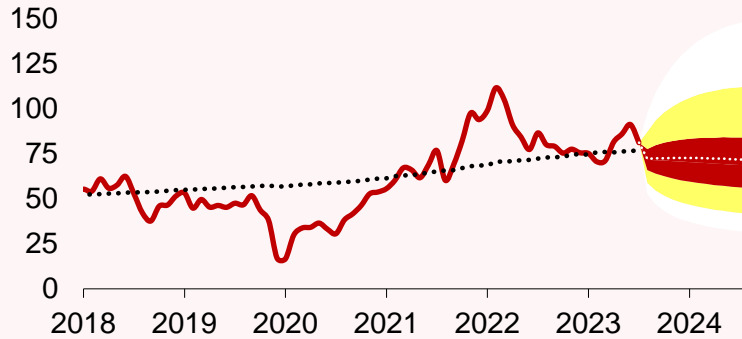


With tepid payroll increases, the unemployment rate edged up in October. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate rose by 0.1% to 3.9% in October per BLS, while non-farm payrolls rose by 150,000, their lowest for the month of October.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

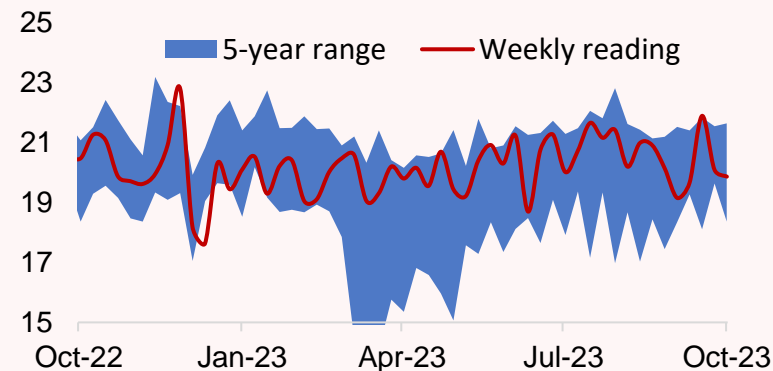
Dollars per barrel (2023\$)



Futures prices have fallen below their historical mean. Mean reversion analysis can be useful in to assess short-term market actions. As prices decreased the past two weeks, they aligned with the best-fit curve through historical prices (MR target). The futures price strip has remained below recent prices (backwardated). Confidence intervals based on past prices show the potential for greater upside than downside.

U.S. petroleum demand

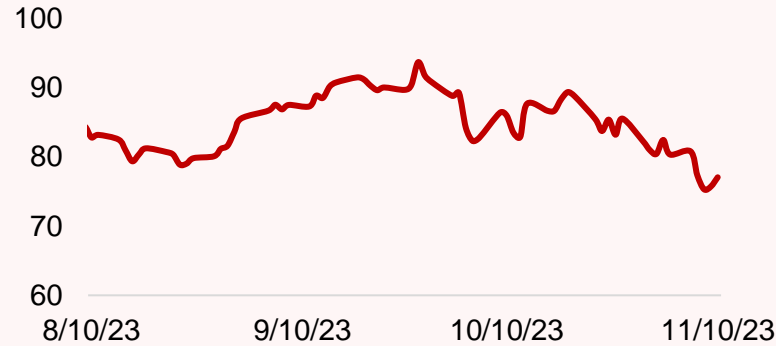
Million barrels per day (mb/d)



Petroleum demand fell. U.S. petroleum demand, as measured by deliveries, of 19.9 mb/d for the week ended Oct. 27 and in the middle of the 5-year range.

WTI crude prompt month futures prices

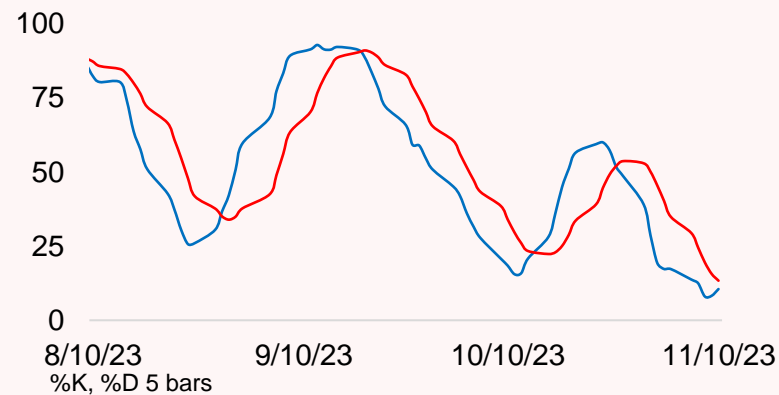
Dollars per barrel



WTI crude oil prices fell by 5.5% w/w to \$77 per barrel per barrel for the week ended Nov. 10 despite market fundamentals have remained tight with solid U.S. demand, strong exports, and historically low inventories.

WTI crude prompt month futures slow stochastic

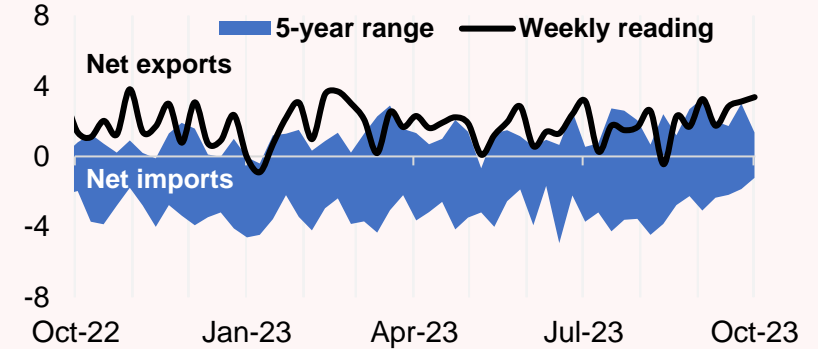
Index level



Price momentum decelerated but steadied during the week ended Nov. 10.

U.S. petroleum net exports (imports)

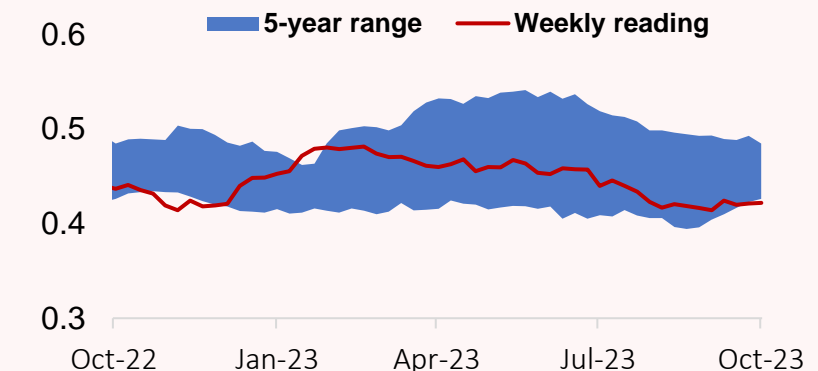
Million barrels per day, mb/d



Petroleum net exports rose. The U.S. was a petroleum net exporter of 3.4 mb/d for the week ended Oct. 27, up from 3.1 mb/d in the prior week. The main driver of the weekly change was increased refined product net exports, partially offset by higher crude oil net imports.

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

Million barrels (mb)

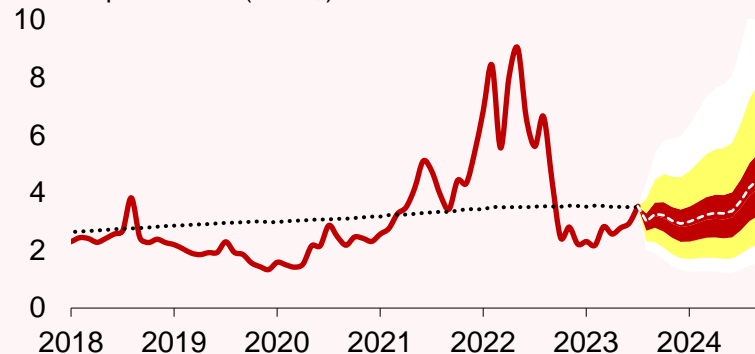


Inventories remained low. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) rose by 0.8 million barrels (mb) for the week ended Oct. 27 but remained at the bottom of the 5-year range.

U.S. natural gas market indicators

Natural gas price mean reversion analysis

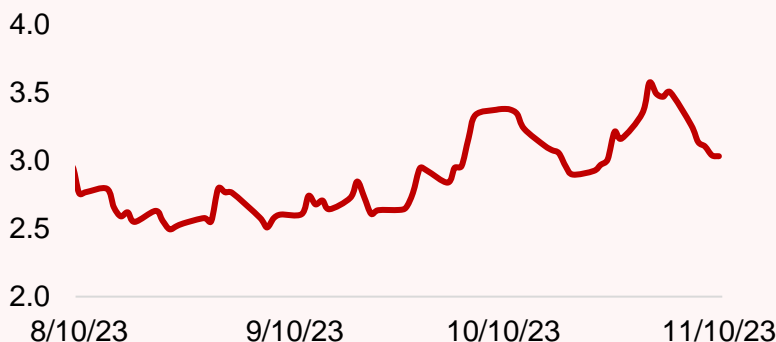
Dollars per mmBtu (2023\$)



Natural gas futures prices of \$3.03 per mmBtu for December 2023 delivery fell below their historical mean. Historical variation continued to show more potential upside than downside.

Natural gas prompt month futures prices

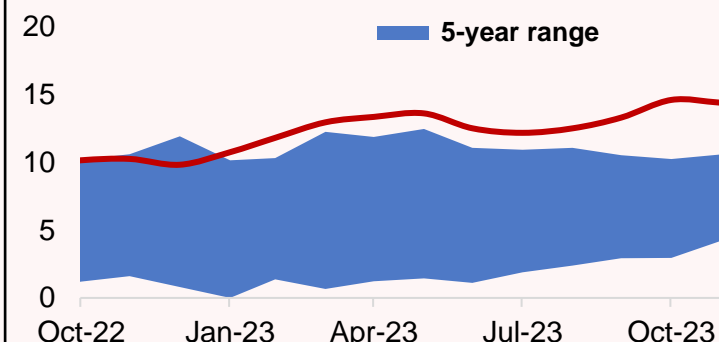
Dollars per million Btu



Natural gas prices at Henry Hub fell by 13% w/w to \$3.03 per million Btu for the week ended Nov. 10, reflecting historically strong storage levels.

U.S. natural gas net exports

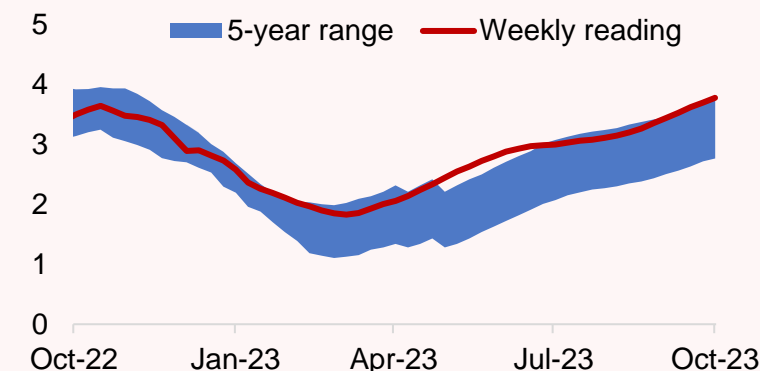
Billion cubic feet per day, bcf/d



Record high net exports. U.S. natural gas net exports are estimated to have reached 14.6 bcf/d in October and 14.4 bcf/d in November per EIA.

U.S. weekly working gas storage

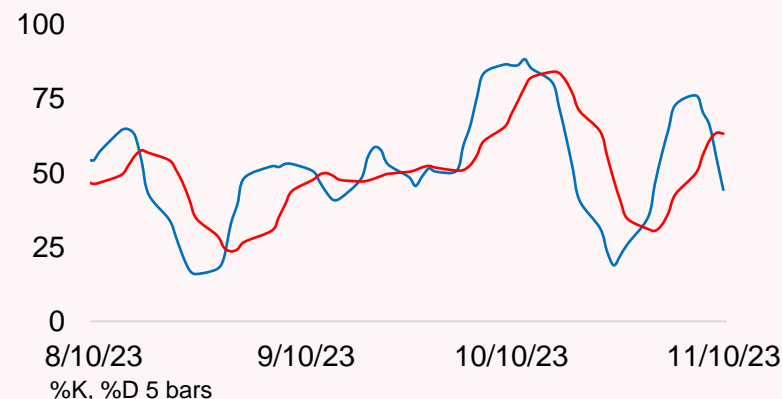
Trillion cubic feet (tcf)



Storage exceeded the top of its 5-year range. Working gas in underground storage (3.78 tcf as of Oct. 27) continued to rise above its 5-year range, and the injection rate of 2.1% w/w rose by 0.1% w/w from the prior week.

Natural gas futures slow stochastic

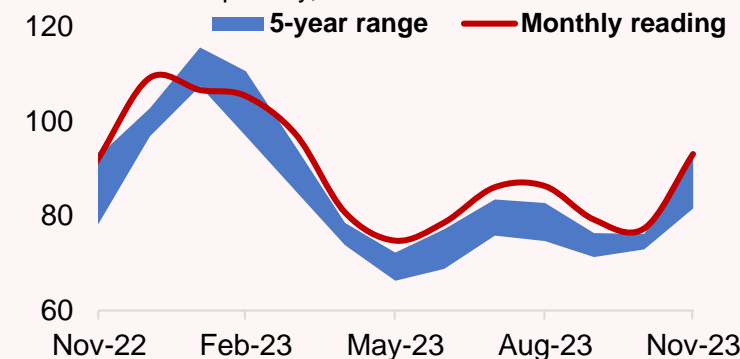
Index level



Natural gas price momentum turned slowed during the week ended Nov. 10.

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

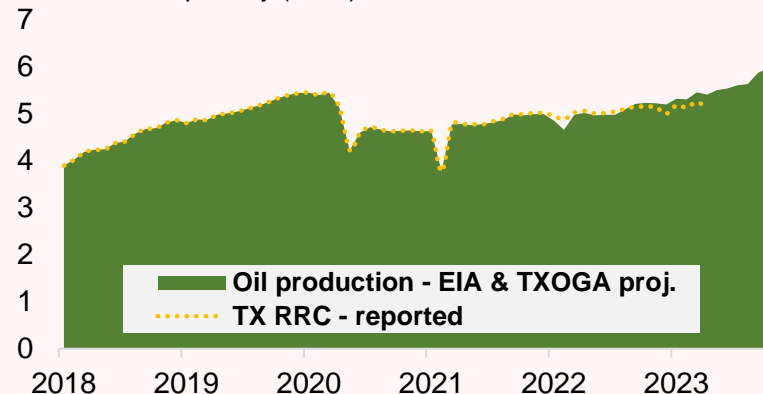


Strong consumption continued. Natural gas total consumption has remained at the top of its five-year historical range.

Texas' oil and natural gas production

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

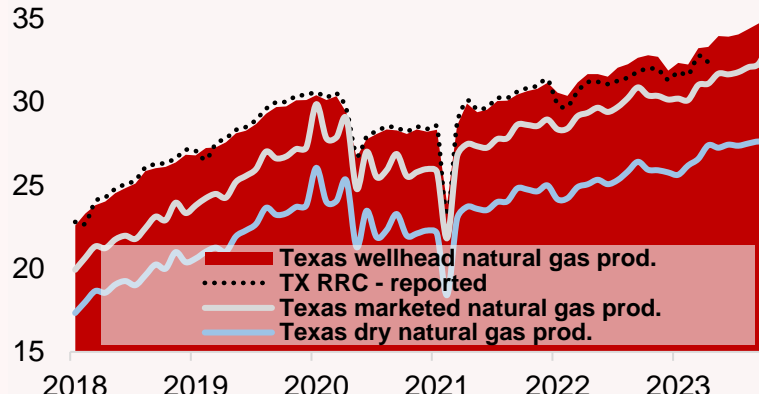
Million barrels per day (mb/d)



Record Texas oil production of 5.6 mb/d for August was reported last week by EIA. TXOGA estimates that Texas crude oil production climbed to 5.9 mb/d in September and 6.0 mb/d in October.

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

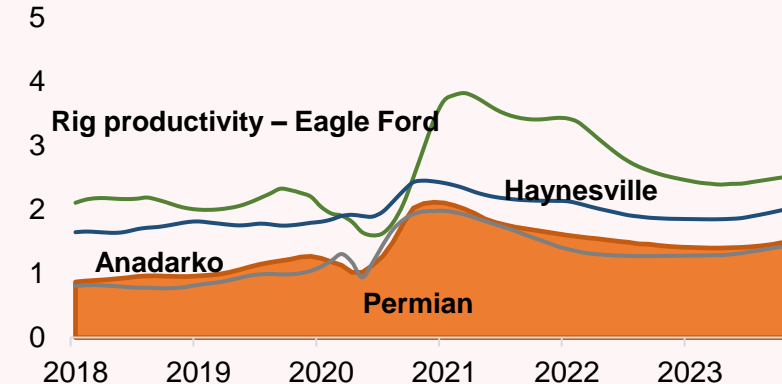
Billion cubic feet per day (bcf/d)



EIA reported for August that Texas' natural gas gross withdrawals (34.1 bcf/d) and marketed production (32.1 bcf/d) set new record highs. TXOGA estimates that in-state production has risen further to 35.0 bcf/d of gross production, including 33.5 bcf/d of marketed production, 27.6 dry gas production, and 3.3 mb/d of natural gas liquids (NGLs).

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

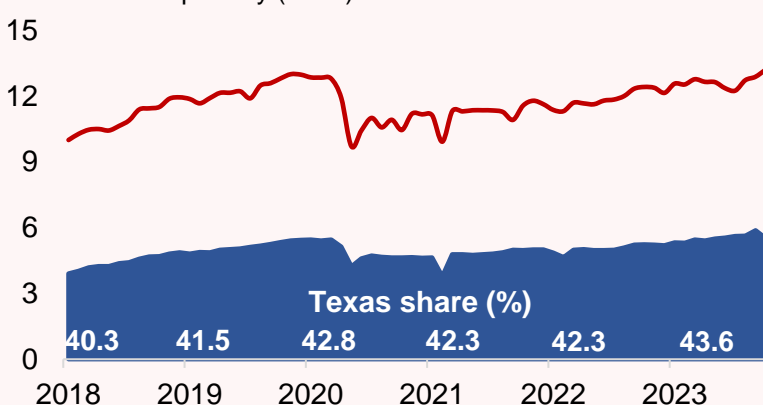
Thousand barrels per day oil-equivalent, kb/doe



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 – Oct. 2023

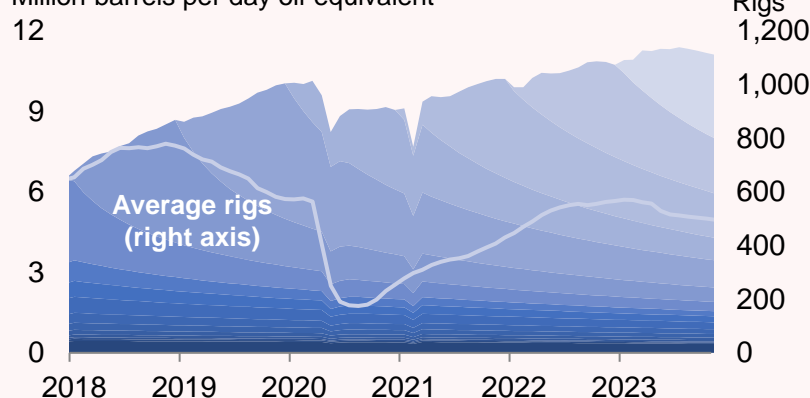
Million barrels per day (mb/d)



Through the first 10 months of the year, Texas accounted for 43.6% of U.S. crude oil production by EIA and TXOGA's estimates.

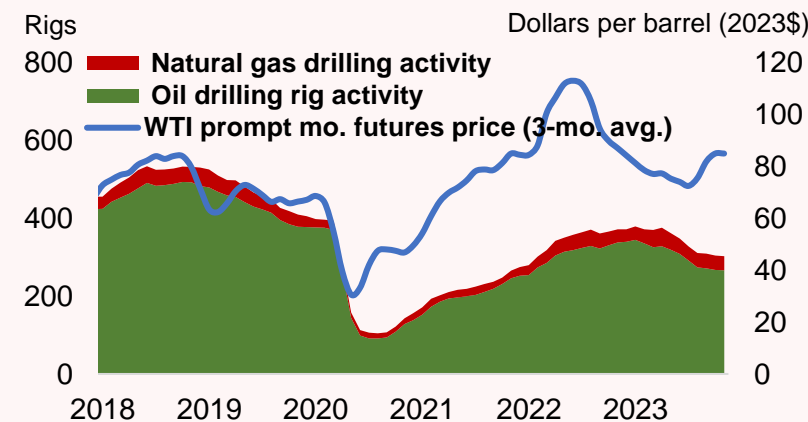
Texas shale basin wellhead oil & natural gas production

Million barrels per day oil-equivalent



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

Texas drilling activity and WTI crude oil futures prices

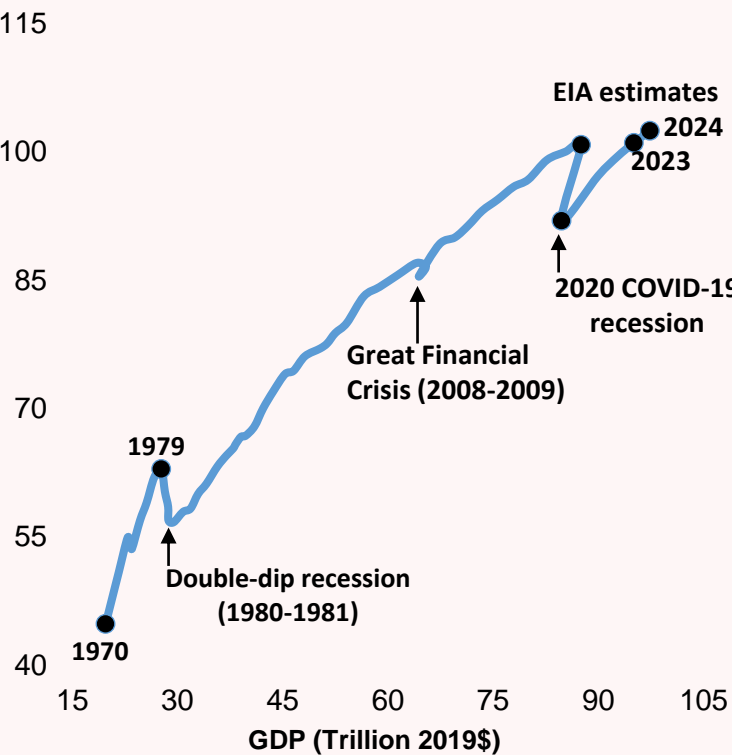


Texas' drilling rig activity fell by 2 rigs for the week ended Nov. 10 per Baker Hughes. Texas had 266 oil-directed rigs (down by 2 rigs w/w) and 36 natural gas-directed rigs (unchanged).

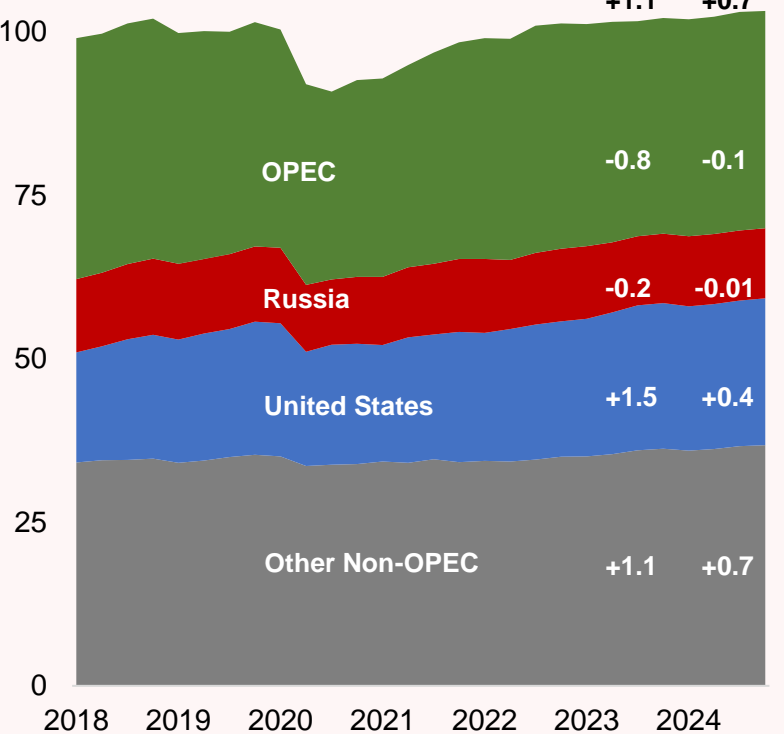
Global oil market balance at-a-glance: EIA estimates for November 2023 show a tight oil market and project Brent at \$93 per barrel in 2024

- **October demand projections for 2023 and 2024 slipped but remain at record levels.** Global oil demand is expected by EIA to reach a record 101.0 mb/d in 2023 and 102.4 mb/d in 2024.
- **EIA raised its 2024 oil production growth** projections by 0.2 mb/d in November. These are volumes needed to balance global markets in their view. The U.S. is assumed to be largest single contributor this year
- **For oil inventories, EIA shows U.S. stock withdrawals through year-end 2023,** corresponding with Brent crude oil prices of \$87 per barrel in Q4 and averaging \$93 per barrel in 2024

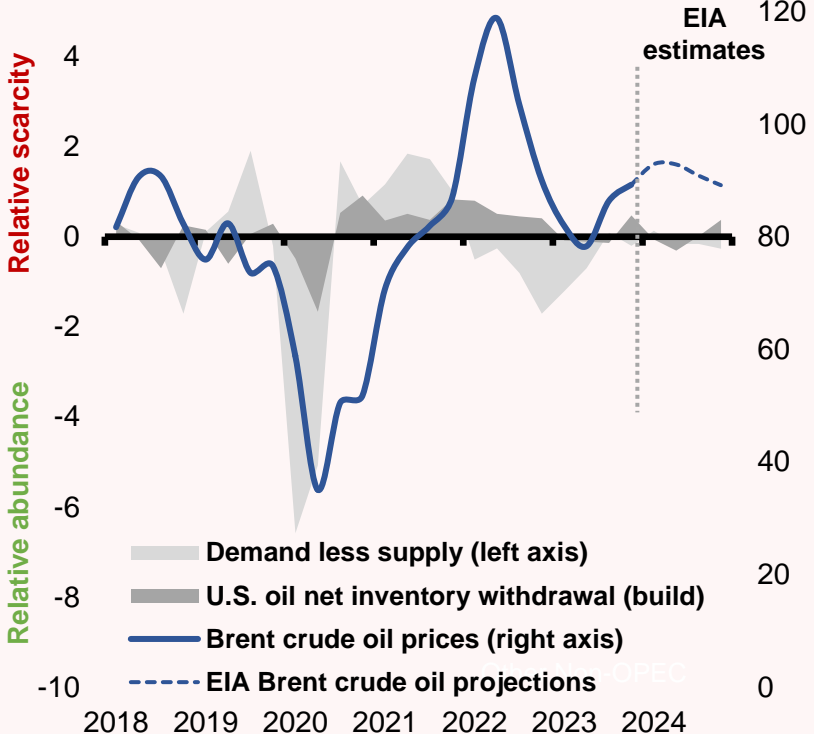
Global oil demand and GDP
Million barrels per day (mb/d)



Oil production by country/region
Million barrels per day, mb/d

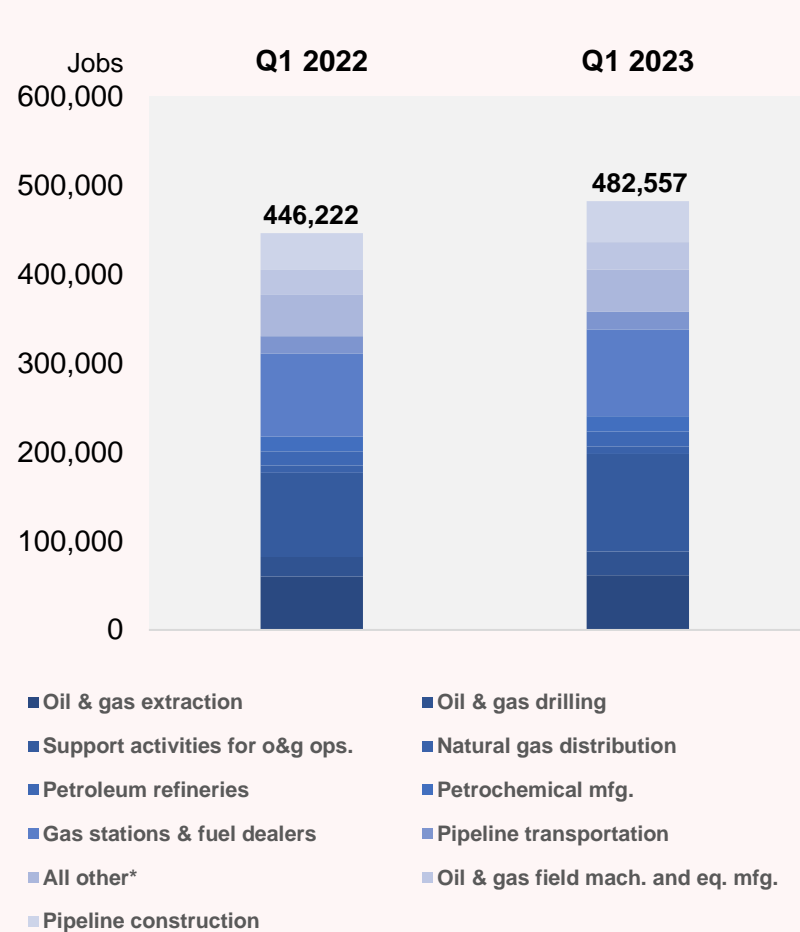


Global demand/supply & Brent prices
Million barrels per day (mb/d) 2023\$/Bbl

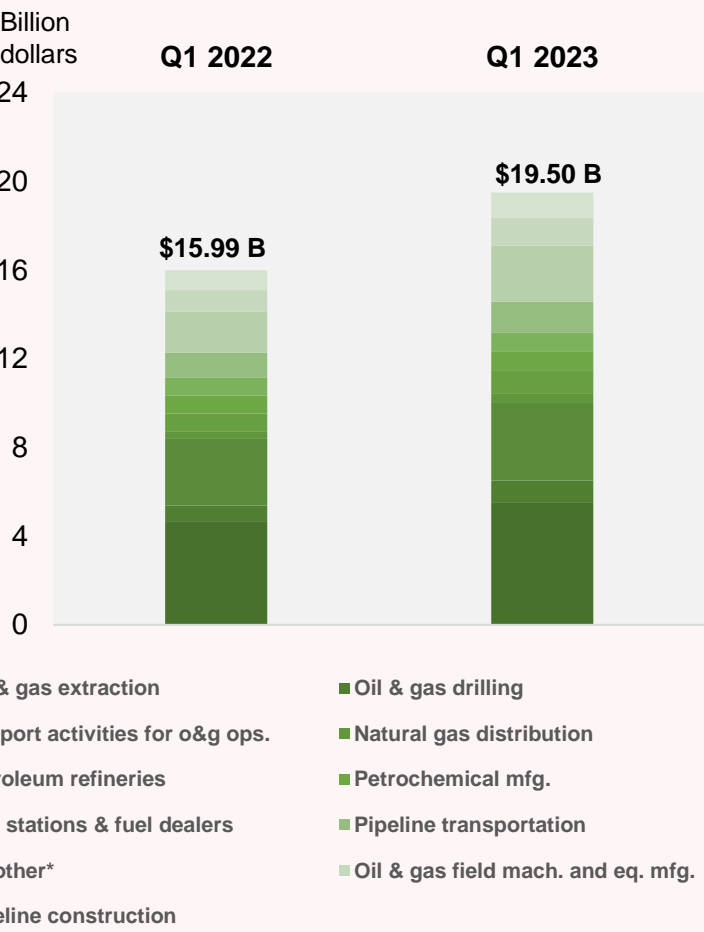


Texas' oil and natural gas industry employment and wages rose strongly

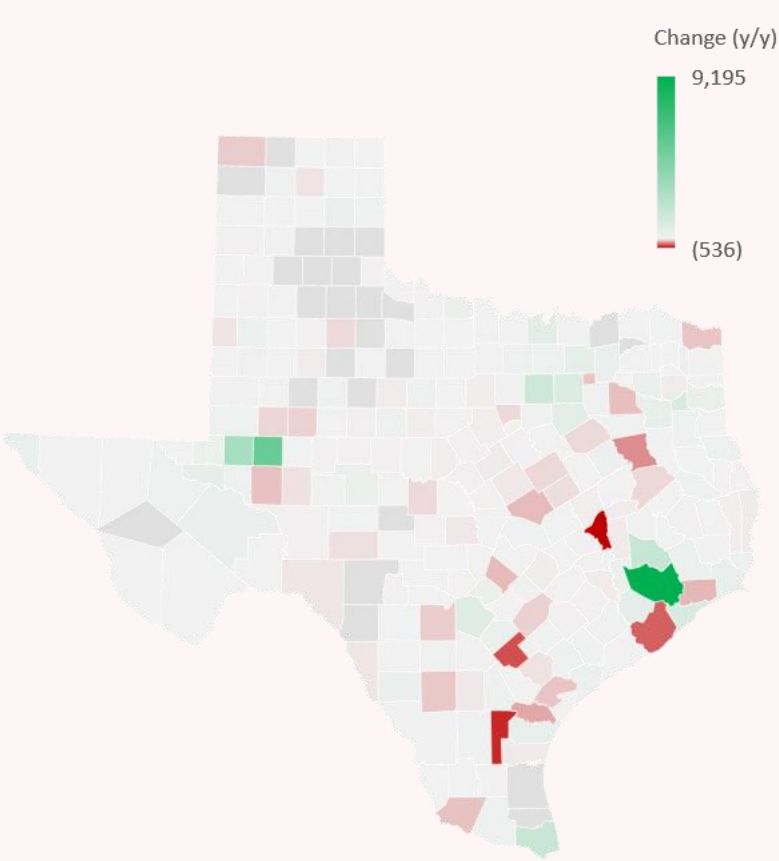
Texas Oil & Gas Industry Employment Rose by +8.1% y/y



Texas Oil & Gas Industry Wages Rose by +22.0% y/y



Heatmap of employment changes by county



* 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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