



October 28, 2024



The TXOGA Chartbook serves as an essential resource for our members and those keen on comprehending the data that narrate ongoing developments within the economy and the oil and gas sectors, both internationally and domestically, including specific trends in Texas.

Key points for the week of October 28, 2024

- **U.S. economic indicators remained stable.** Federal Funds 30-day futures held at 4.8%, indicating no expected rate changes in November, while yields on long-term bonds, particularly lower-quality corporate bonds, edged higher during the week ending October 25. Business conditions remain favorable for GDP growth in Q4 2024, as indicated by the Philadelphia Fed's ADS Index and the University of Michigan's consumer sentiment survey, which recorded its highest business conditions reading in six months.
- **Oil market fundamentals loosened slightly, but prices stabilized as geopolitical tensions in the Middle East eased.** West Texas Intermediate (WTI) crude oil prices rose 3.6% week-over-week (w/w) to nearly \$72 per barrel as of October 25. U.S. crude oil production remained at a record-high 13.5 million barrels per day (mb/d), while domestic demand (20.3 mb/d) and net petroleum exports (2.5 mb/d) declined, leading to a 5.5 million-barrel increase in crude oil inventories, according to the Energy Information Administration's (EIA) data as for the week ended October 18.
- **U.S. natural gas prices rose by 12.2% w/w amid strong consumption, exports, and winter weather forecasts.** U.S. natural gas consumption exceeded 80 billion cubic feet per day (bcf/d) in October, and net exports reached a record 13.8 bcf/d, per EIA projections. Updated weather projections from NOAA and AccuWeather predict below-average temperatures in the Pacific Northwest, above-average temperatures in the Southeast, and increased storm activity.
- The [Chart of the Week](#) highlights how mean reversion analysis has recently been effective in both oil and natural gas markets.

TXOGA Chart of the Week: Oil and natural gas price mean reversion updates

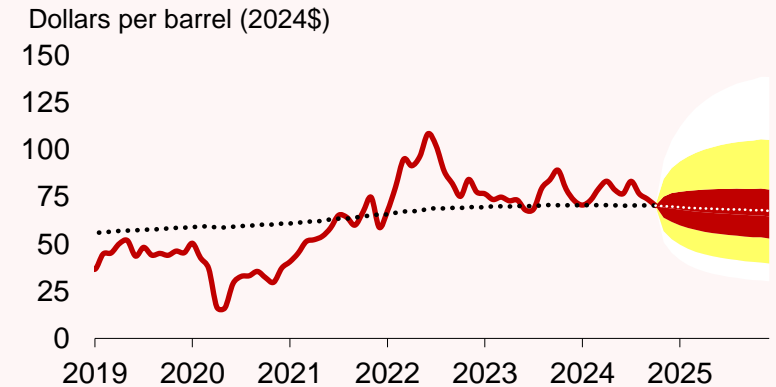
› Defining terms

- Mean reversion analysis is useful for assessing short-term markets, as fundamental factors often cause prices to revert to their mean over time, even though the timing of this reversion can be uncertain..
- These analyses are not forecasts but instead compare futures prices (represented by the dotted white line) with a mean reversion target (dotted black line) and confidence intervals based on historical data.
- Historical price variation and the tendency for prices to return to their mean help inform these confidence intervals (represented by the red, yellow, and white ranges).

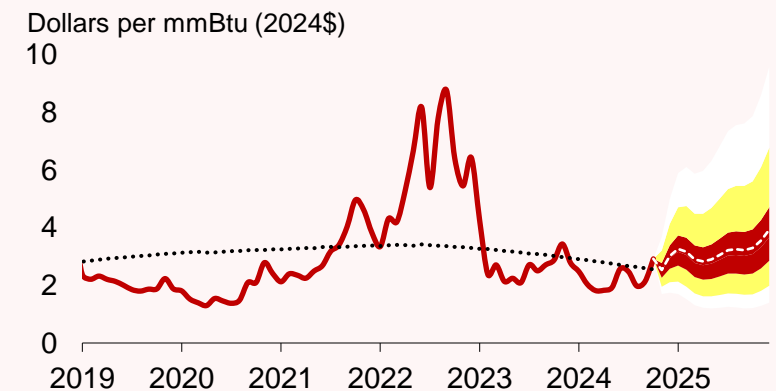
› Recent price behavior

- In recent months, mean reversion analysis has proven to be useful for both oil and natural gas prices.
- As of October 25, West Texas Intermediate (WTI) crude oil futures have re-aligned with the historical mean reversion target. The futures strip remains in backwardation (i.e., futures prices are currently lower than spot prices), with historically-based confidence intervals suggesting greater potential for upside than downside.
- Natural gas futures prices for November are currently below the historical mean reversion target, and the contract for January delivery is 30% higher and in contango (i.e., futures prices are currently higher than spot prices).

WTI crude oil price mean reversion analysis

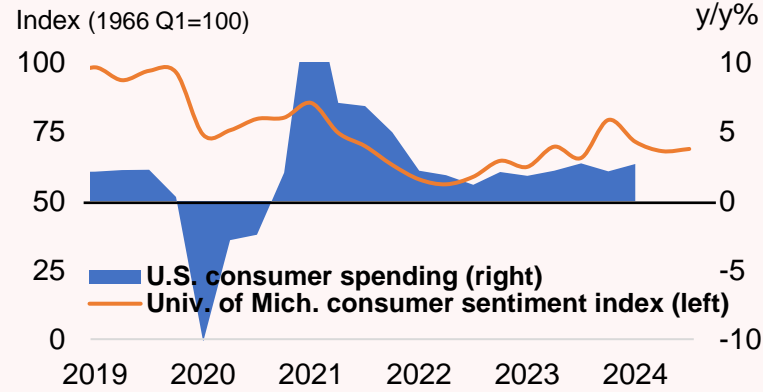


Natural gas price mean reversion analysis



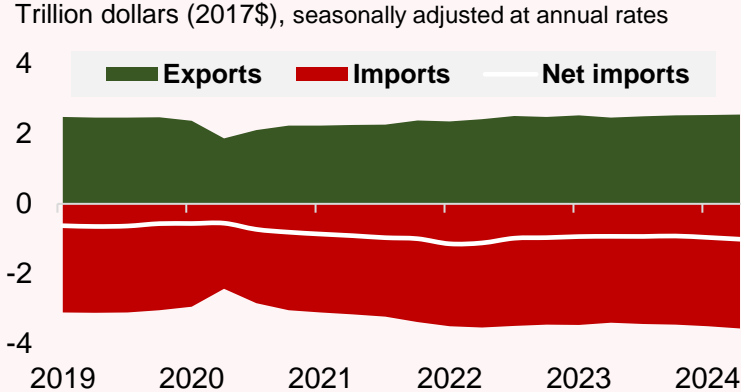
U.S. economic indicators

Consumer sentiment vs. spending



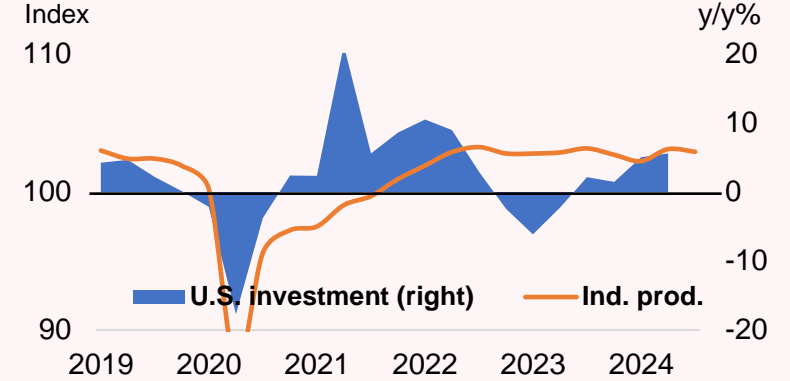
Consumer sentiment slipped. Consumer sentiment fell by 1.7% m/m, according to the University of Michigan's initial survey for October. However, the overall strength of sentiment historically implies consumer spending growth for Q4 2024. Consumer spending grew by 2.7% y/y in Q2 2024 per the Bureau of Economic Analysis.

Real net exports of goods and services



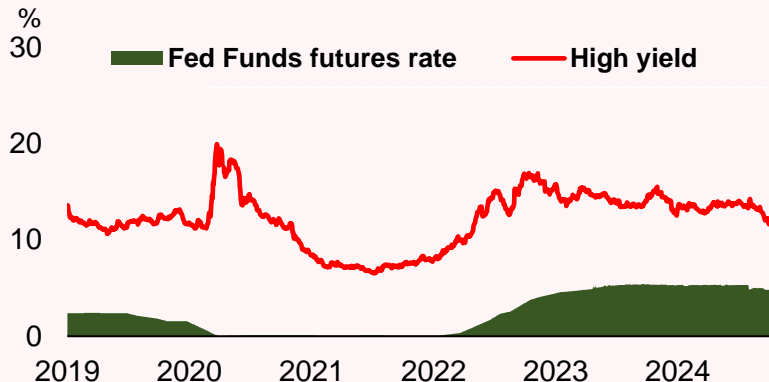
U.S. petroleum trade surplus revised up for Q2 2024. The U.S. real trade deficit ran at an annualized rate of \$1.04 trillion in Q2 2024 per BEA. On a nominal basis, the trade surplus for petroleum and products was revised upwards by \$3.1 billion to \$35.7 billion in Q2 2024.

Industrial production and investment growth



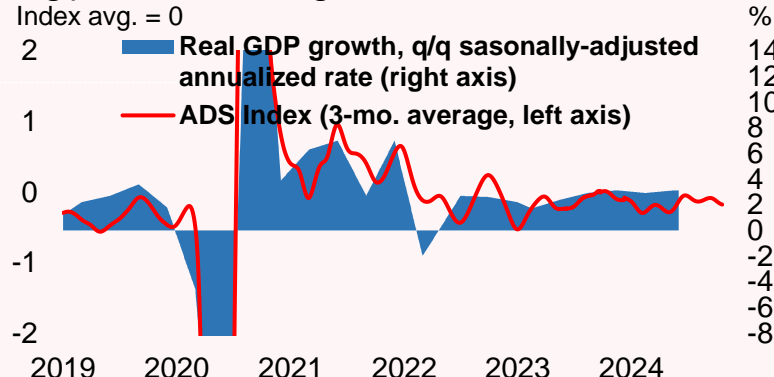
Solid investment growth. In updated GDP data for Q2 2024, economy-wide investment grew by 5.6% y/y per BEA. U.S. industrial production edged down by 0.2% m/m in September, per the Federal Reserve Board – but continues to suggest investment growth in Q3 2024.

Fed Funds rate and CCC and lower corporate bond yields



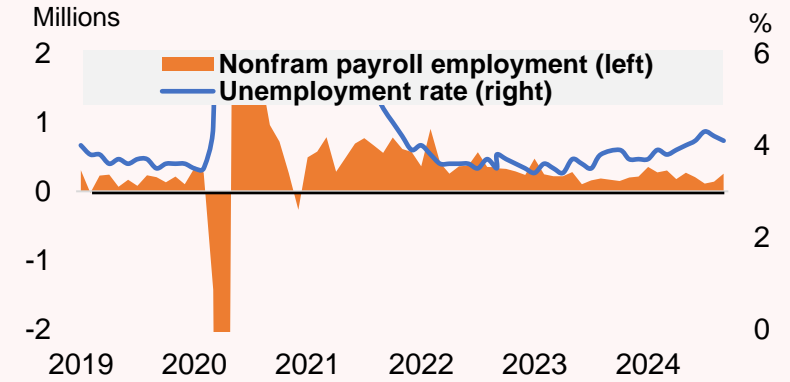
Increased bond premium for low credit quality. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. For the week ended Oct. 25, HY rose by 0.1% w/w to 11.7%, while Fed Funds futures rate was steady at 4.8%, resulting in a premium for low credit quality of 6.9%.

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



The ADS index stabilized. 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 accurately reflected real GDP growth and, with readings as of Oct. 25 remained consistent with further growth through Q4 2024.

Nonfarm payroll employment & unemployment rate

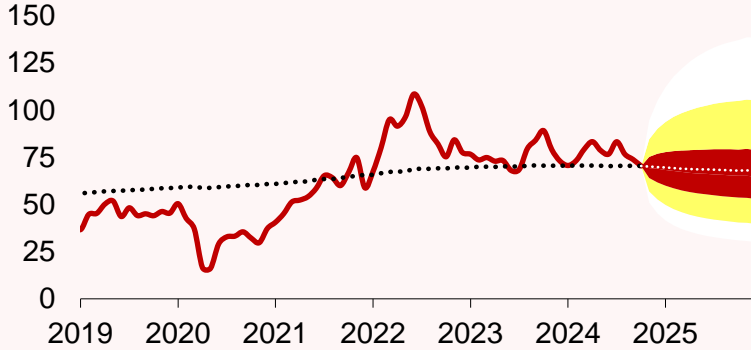


Labor market conditions strengthened in September. The employment situation is a lagging indicator of GDP growth. As nonfarm payrolls rose by 254,000—the highest since March—the U.S. unemployment rate fell by 0.1% m/m to 4.1% in September per BLS.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

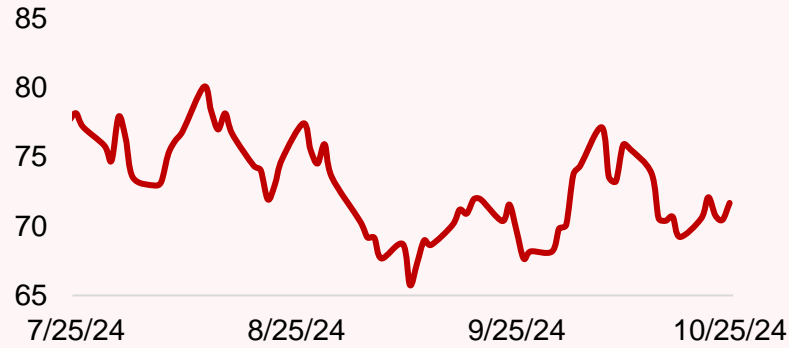
Dollars per barrel (2024\$)



Futures prices aligned with the historical mean reversion target. The futures strip remains 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

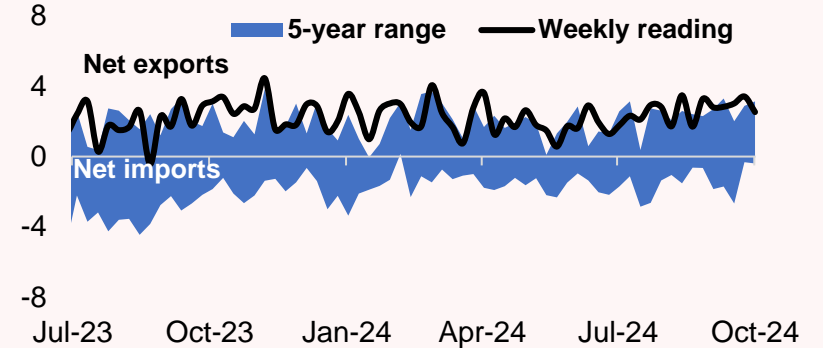
Dollars per barrel



WTI crude oil prices rose by 3.6% w/w to nearly \$72 per barrel as of October 25, as the market stabilized following declines the prior week which reflected a lower geopolitical premium.

U.S. petroleum net exports (imports)

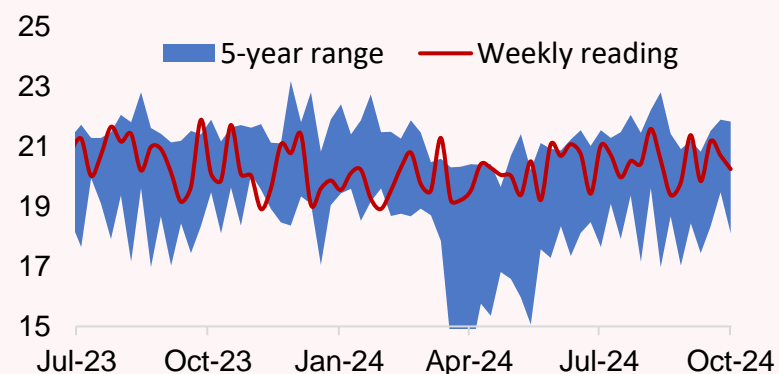
Million barrels per day, mb/d



Petroleum net exports fell. The U.S. was a petroleum net exporter of 2.5 mb/d for the week ended Oct. 18, down by 0.9 mb/d from the prior week.

U.S. petroleum demand

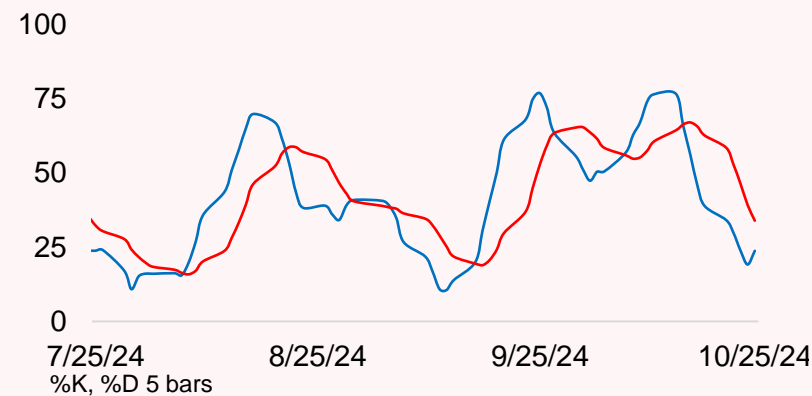
Million barrels per day (mb/d)



Petroleum demand decreased. U.S. petroleum demand, as measured by deliveries, fell by 0.4 mb/d w/w to 20.3 mb/d for the week ended Oct. 18.

WTI crude prompt month futures slow stochastic

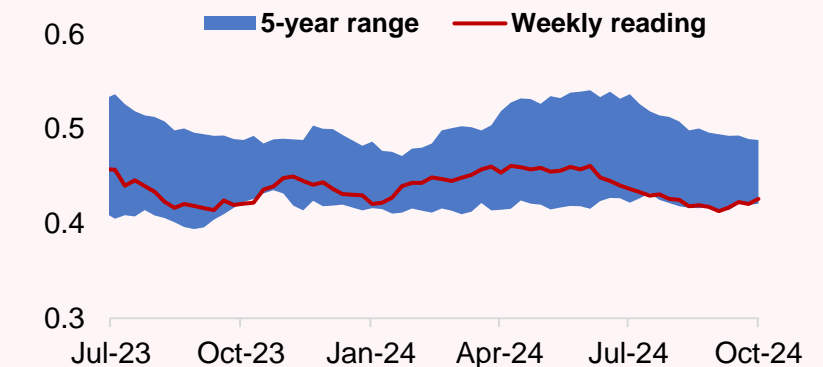
Index level



Price momentum slowed during the week ended Oct. 25.

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

Billion barrels

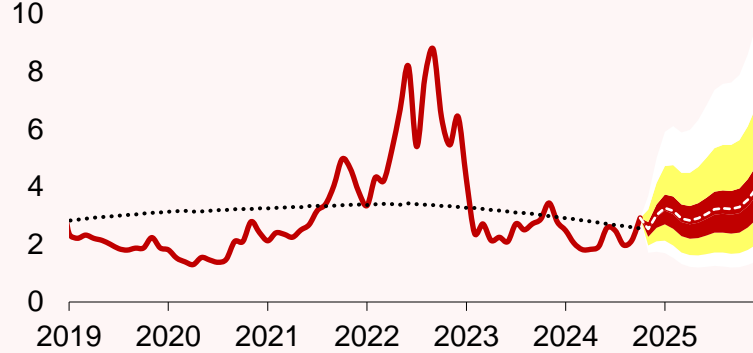


Inventories increased. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) increased by 5.5 million barrels (mb) for the week ended Oct. 18.

U.S. natural gas market indicators

Natural gas price mean reversion analysis

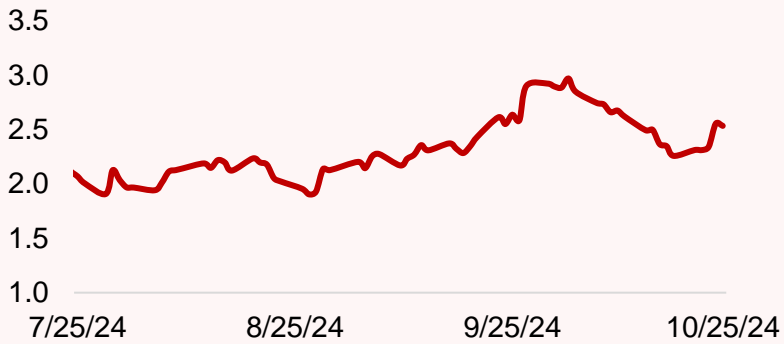
Dollars per mMBtu (2024\$)



Near-term natural gas futures prices fell below the historical mean reversion target and rise by 30% between the contracts for delivery in November and January. Confidence intervals based on past prices show the potential for greater upside than downside.

Natural gas prompt month futures prices

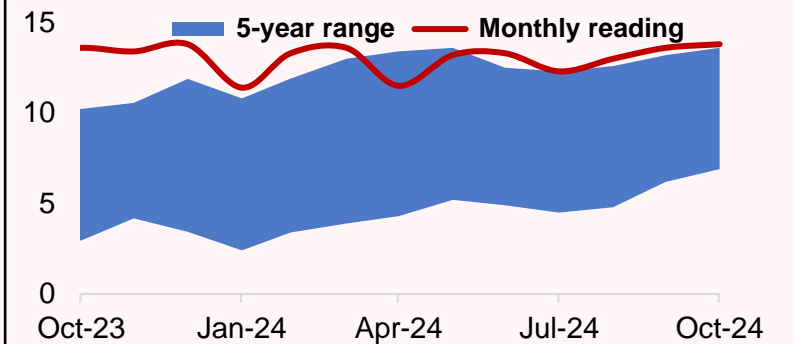
Dollars per million Btu



Natural gas prices at Henry Hub rose by 12.2% w/w to \$2.53 per million Btu for the week ended October 25.

U.S. natural gas net exports

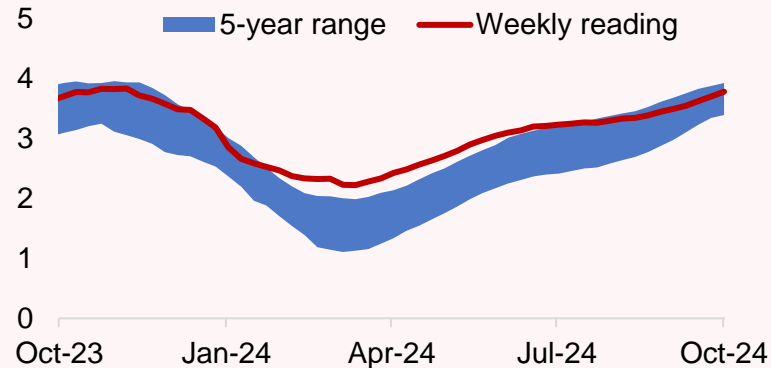
Billion cubic feet per day, bcf/d



Natural gas net exports of 13.8 bcf/d, as projected for October by EIA, rose above the 5-year range and to a record high for any month on record.

U.S. weekly working gas storage

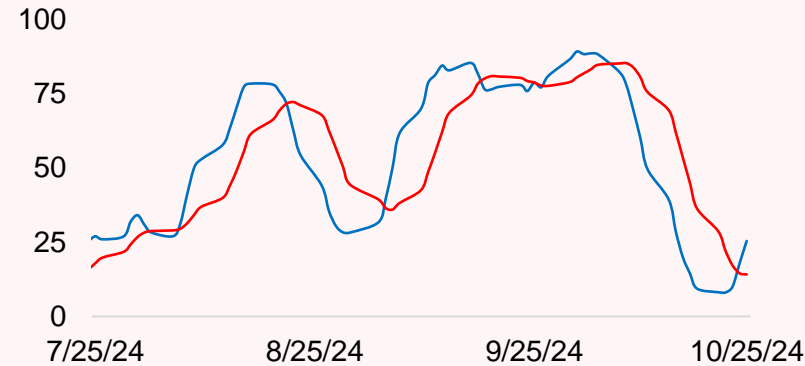
Trillion cubic feet (tcf)



Storage stabilized within the 5-year range. Working gas in underground storage rose by 2.2% w/w to 3.79 tcf as of Oct. 19 and rose to the 73rd percentile within the 5-year range.

Natural gas futures slow stochastic

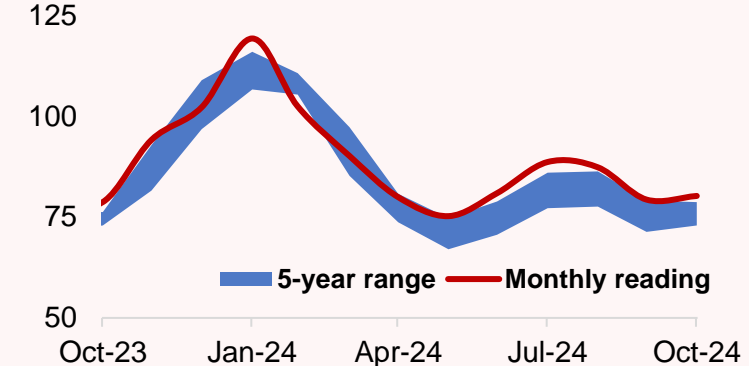
Index level



Natural gas price momentum fell during the week ended October 25.

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

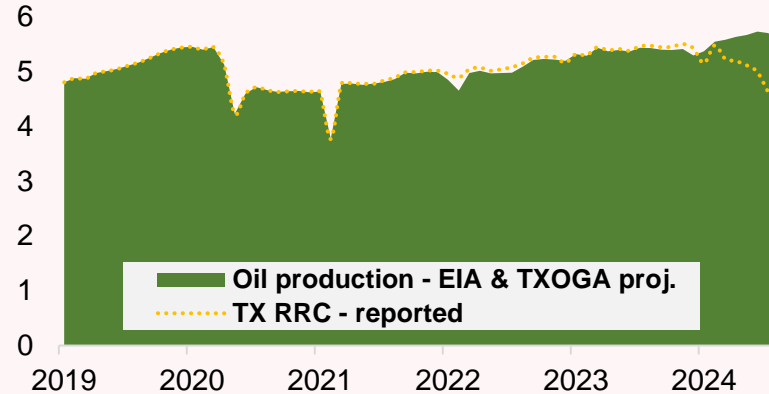


Consumption remained strong. U.S. natural gas consumption of 80.2 bcf/d in October per EIA remained above the top of the 5-year range.

Texas' oil and natural gas production

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

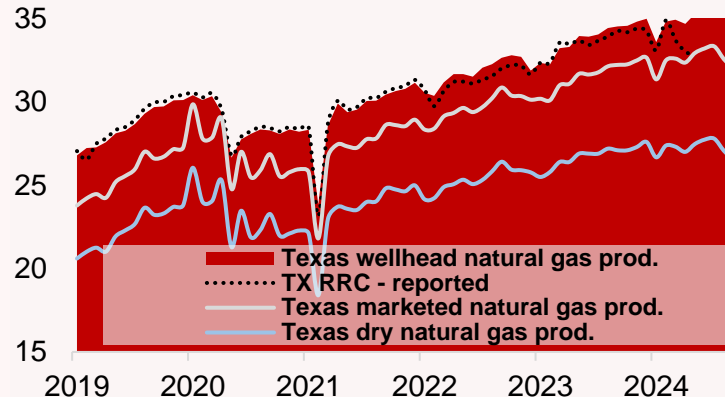
Million barrels per day (mb/d)



Near-record oil production. Texas' oil production remained above 5.7 mb/d in July per EIA, and TXOGA estimates that it slipped to 5.62 and 5.65 mb/d in August and September, respectively.

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

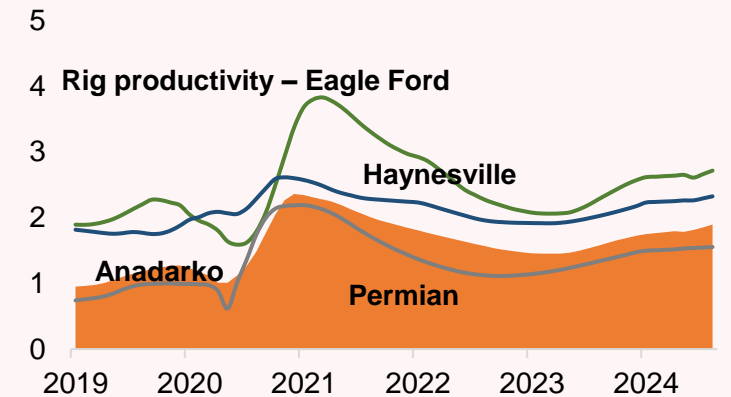
Billion cubic feet per day (bcf/d)



Record-high natural gas production. Texas produced record highs of 35.7 bcf/d of natural gas gross withdrawals and 33.3 bcf/d of marketed production in July per EIA. TXOGA estimates that Texas' marketed production was 32.0 bcf/d in September with 26.5 bcf/d of dry gas production.

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

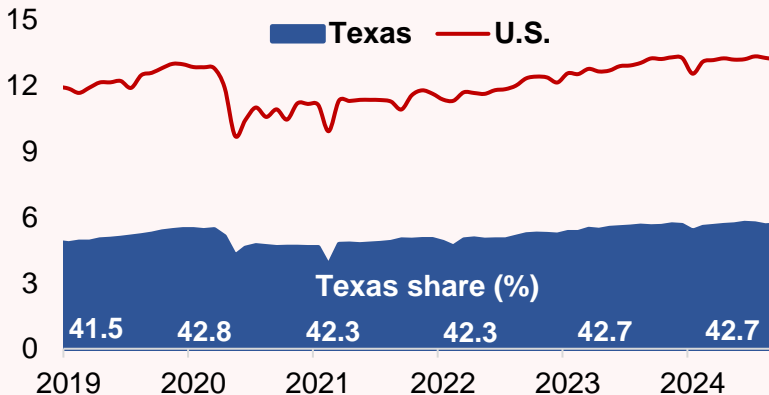
Thousand barrels per day oil-equivalent, kb/dae



Strong productivity gains. EIA estimates of rig productivity for August 2024 show continued increases year-over-year across the major Texas basins, including the Anadarko (+13.4% y/y), Eagle Ford (+15.1% y/y), Permian (+17.0% y/y), and Haynesville (+13.0% y/y).

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

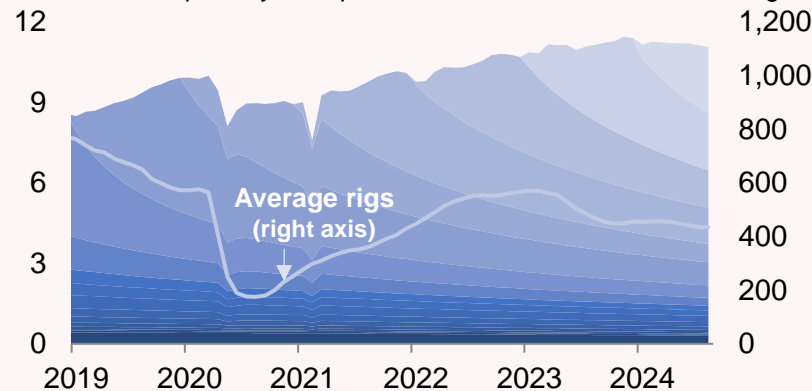
Million barrels per day (mb/d)



Texas' share remained strong. Texas accounted for an estimated 42.7% of U.S. crude oil production year-to-date through September by TXOGA's estimates.

Texas shale basin wellhead oil & natural gas production

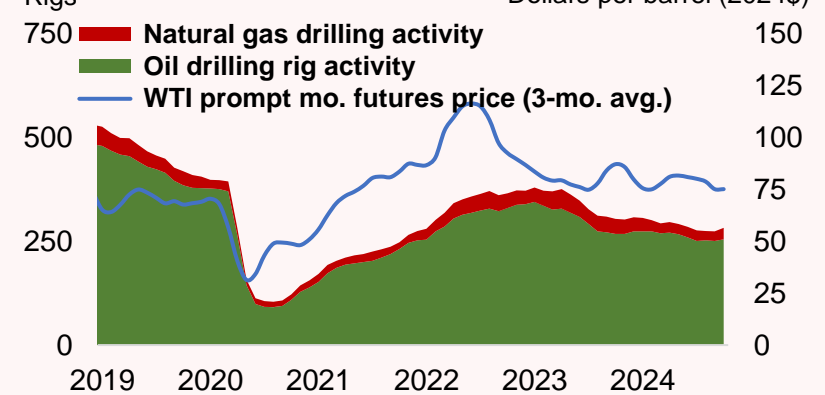
Million barrels per day oil-equivalent



EIA estimates show oil and natural gas production across Texas shale basins changes in August 2024 Permian (+6.6% y/y) but fallen in the Eagle Ford (-3.3% y/y), Haynesville (-13.7% y/y), and Anadarko (-0.8% y/y) regions.

Texas drilling activity and WTI crude oil futures prices

Rigs (left axis), Dollars per barrel (2024\$) (right axis)

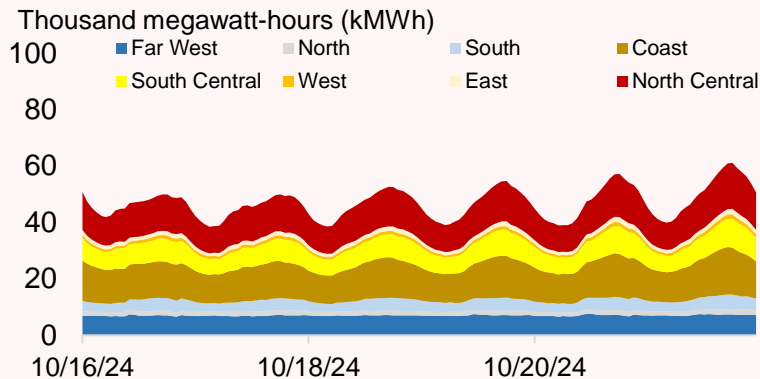


Texas' drilling rig activity was steady overall for the week ended October 25 per Baker Hughes. Texas had 254 oil-directed rigs (down by 2 rigs w/w) and 29 natural gas-directed rigs (up by 2 rigs w/w).

Texas Electricity Analysis

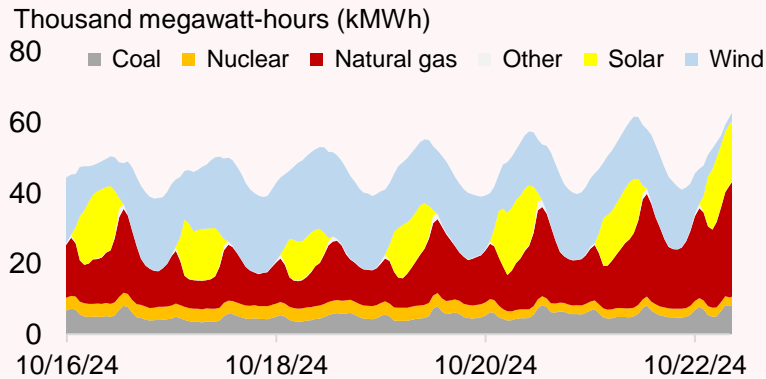


ERCOT electricity load by region



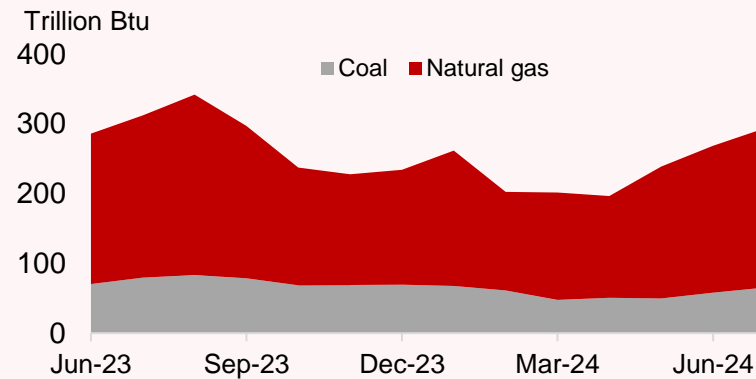
For Oct. 16-22, ERCOT's average hourly electricity load was 47.0 kMWh, down by 12.9% w/w, while the maximum load hourly load of 61.1 kMWh fell by 13.8% w/w. Variability was the highest in the South Central and South regions.

ERCOT hourly electricity generation by source



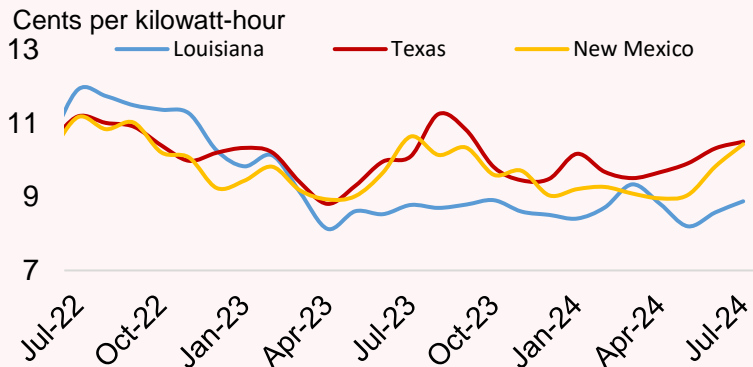
Thermal and dispatchable resources generated up to 85% of ERCOT's electricity. ERCOT's hourly electricity generation for the period Oct. 16-22 ranged between 39 and 65 kMWh with a standard deviation of 6.2 kMWh. Thermal and dispatchable sources generated 85% of the region's power on the night of Oct. 22, including 65% from natural gas.

Texas electricity plant receipts of natural gas and coal



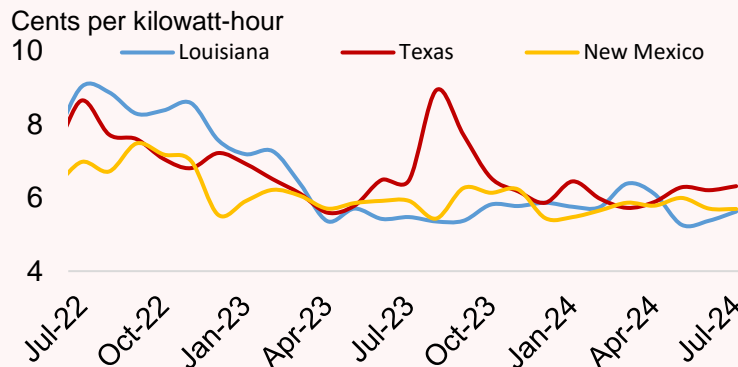
Texas electricity plant receipts of natural gas and coal increased seasonally but decreased year-over-year by 1.9% y/y and 17.4% y/y, respectively, in July 2024.

Electricity prices – average across all end-use sectors



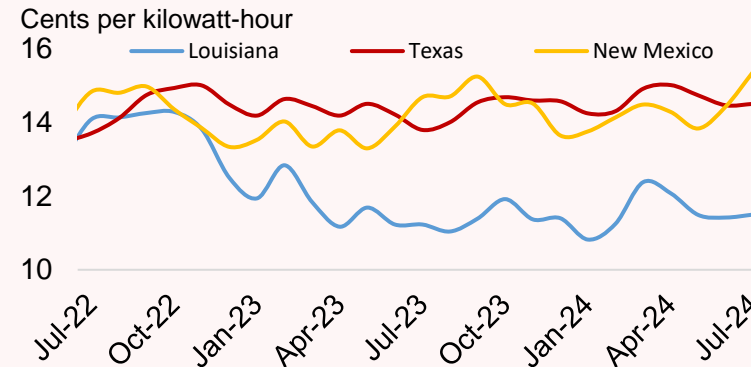
Texas' electricity prices rose in July. The average price of electricity in Texas increased by 1.7% m/m in July to 10.50 cents per kWh, compared with 8.88 cents per kWh in Louisiana and 10.43 cents per kWh in New Mexico.

Industrial electricity prices



Texas' industrial electricity prices decreased. Texas' industrial electricity prices averaged 6.31 cents per kWh in July, up by 1.8% m/m. Rates in New Mexico and Louisiana remained lower at 5.69 cents per kWh and 5.62 cents per kWh, respectively.

Residential electricity prices



Texas' residential electricity prices rose. For Texas' residential consumers, the average price of electricity (14.51 cents per kWh) rose by 0.3% m/m from June, remaining above rates in Louisiana (11.50 cents per kWh) but lower than that in New Mexico (15.39 cents per kWh).

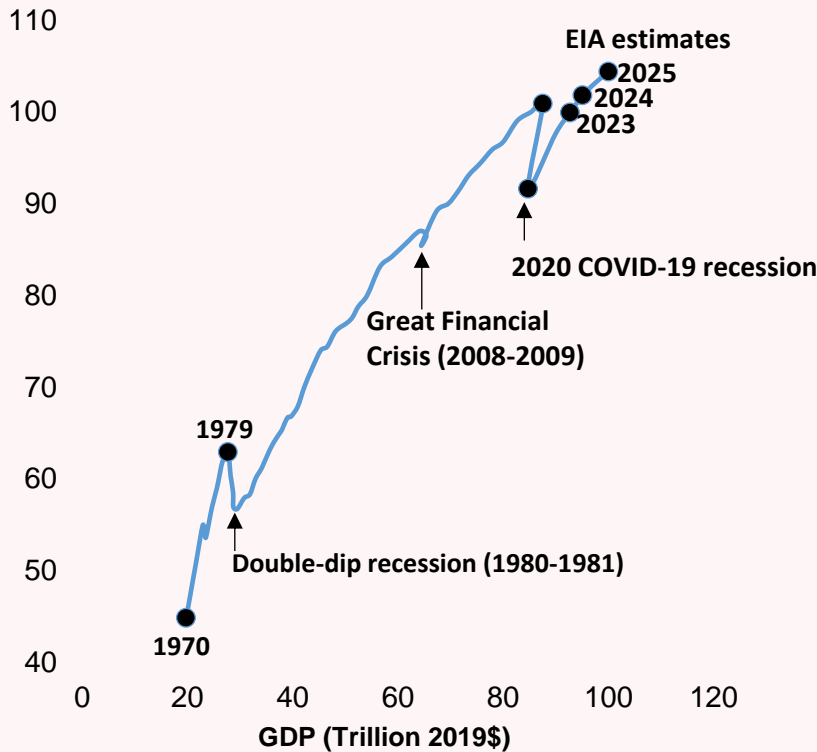
Global Oil Market Balance Projections to 2025



- **Record-high global demand.** EIA's October 2024 Short-Term Energy Outlook projects global demand of 103.1 mb/d this year and 104.4 mb/d in 2025 – both record highs.
- **Supply shifts.** In the latest forecast, EIA reflected relatively greater OPEC supplies and lower Russian output this year. The U.S. remains the largest source of supply growth in 2025.
- **For oil inventories, EIA projects global stock withdrawals to continue through Q2 2025,** including 0.6 mb/d in Q4 2024 and Q1 2025, corresponding with Brent crude oil prices of \$76 in Q4 2024 and \$78 on average in 2025, compared with \$79 per barrel currently.

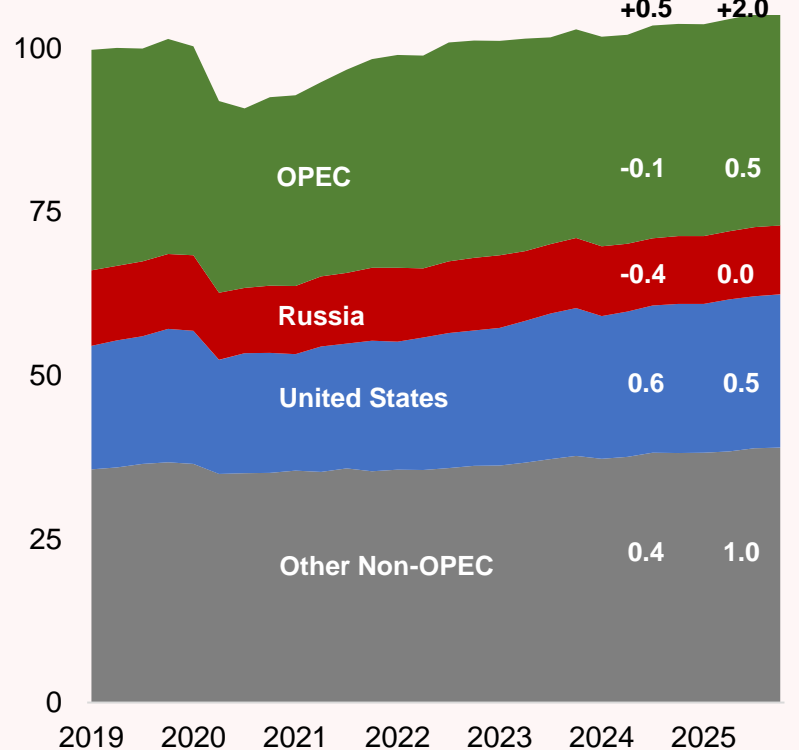
Global oil demand and GDP

Million barrels per day (mb/d)



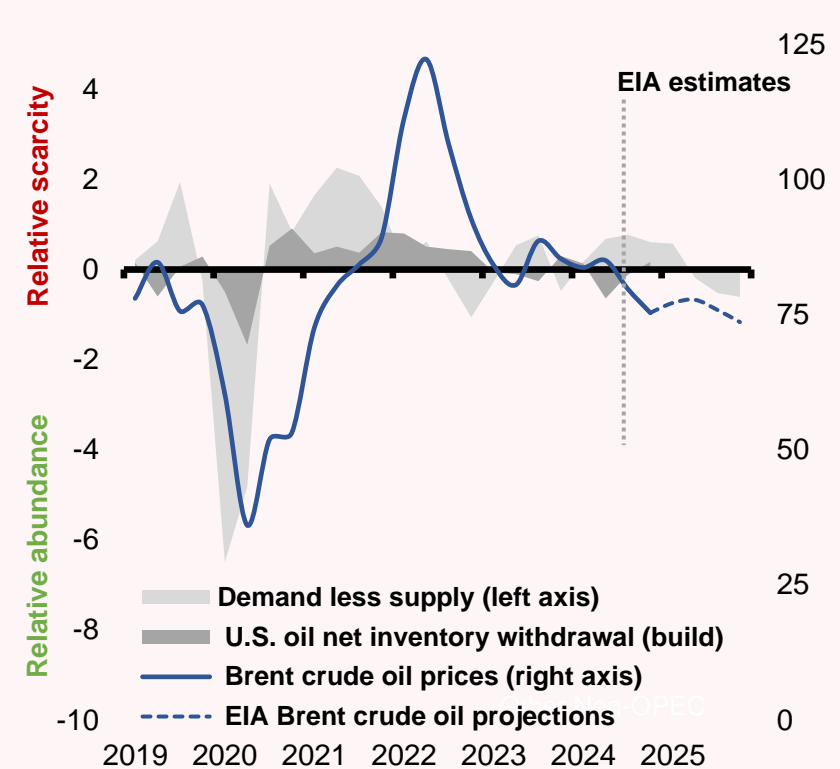
Oil production by country/region

Million barrels per day, mb/d



Global demand/supply & Brent prices

Million barrels per day (mb/d)



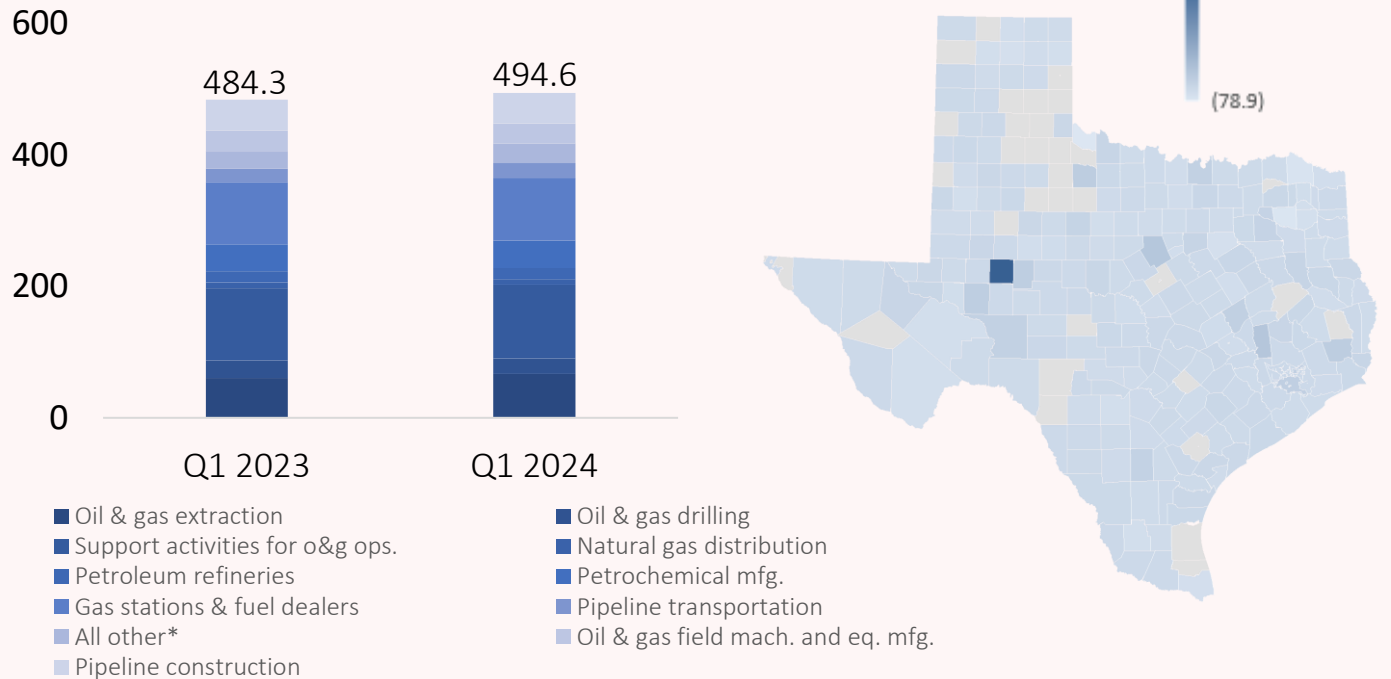
Texas' oil and natural gas industry wages eclipsed \$20.8 billion in Q1 2024



- ▶ Texas' oil and natural gas industry employment and wages grew by 2.1% y/y and 6.5% y/y, respectively, in Q1 2024, raising the totals to nearly 494,593 jobs and \$20.8 billion in wages – the highest wages since the 2020 pandemic.
- ▶ Two-thirds of the year-over-year job growth occurred in the upstream and supporting services, while another quarter of the job growth occurred in pipeline transportation per the latest data (released on August 20, 2024) from the U.S. Census Bureau and Texas Workforce Commission.

Texas oil and natural gas industry direct employment rose by +2.1% y/y in Q1 2024

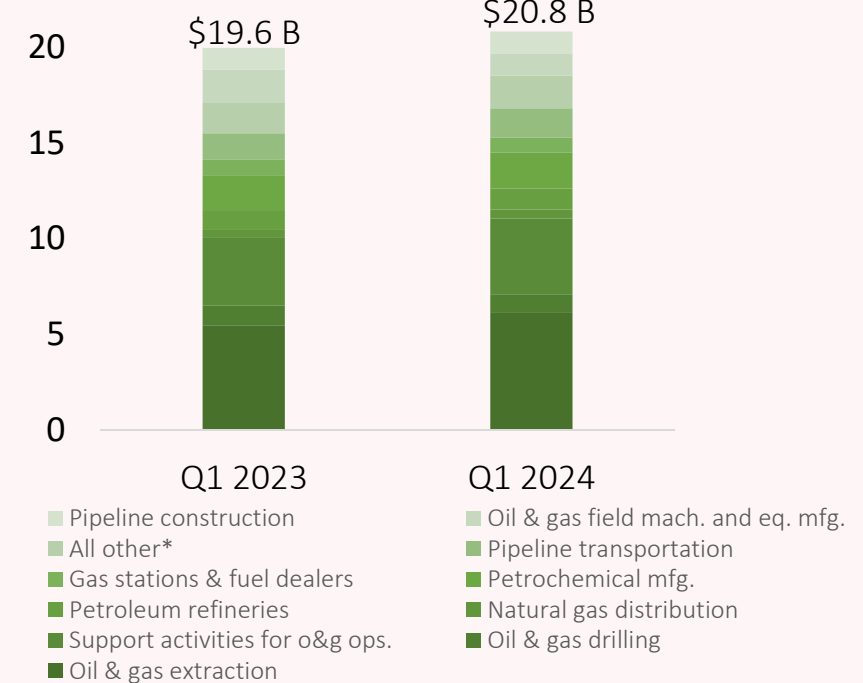
Thousand Jobs



* 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.

Texas oil and natural gas industry direct wages rose by +6.5% y/y in Q1 2024

Billion dollars



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