



March 25, 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 March 25, 2024

- **U.S. economic indicators remained stable this week.** Consumer sentiment continued to show strength, with the March reading of the University of Michigan's survey remaining strong. The Aruoba-Diebold-Scotti (ADS) Business Conditions Index, published by the Federal Reserve Bank of Philadelphia, pointed to ongoing favorable conditions, supporting economic expansion in Q1 2024. High-yield corporate bond yields held steady week-over-week (w/w) as of March 22, maintaining their lowest levels since December 2023.
- **Oil market fundamentals remained strong.** U.S. crude oil stocks decreased by 2.0 million barrels for the week ended March 15, reflecting the combined impact of a 2.3 million barrels per day (mb/d) increase in U.S. petroleum net exports—marking the second-highest weekly net exports ever—and a 1.1 mb/d decline in domestic petroleum demand, according to data from the Energy Information Administration (EIA).
- **Unusual uptick in natural gas storage levels.** Despite historical trends showing an average 3.2% week-over-week (w/w) decrease in U.S. natural gas storage levels by this point in winter over the past decade, storage levels increased by 0.3% w/w as of March 15. This marks the largest and only the second increase for week 11 of the year since 2012. With storage levels standing 14.7% above the top of their 5-year range, domestic real natural gas prices are poised to reach their lowest levels since 1994.
- The [Chart of the Week](#) highlights the effectiveness of global oil and natural gas-related investments, primarily driven by the private sector, in meeting the world's energy demands.

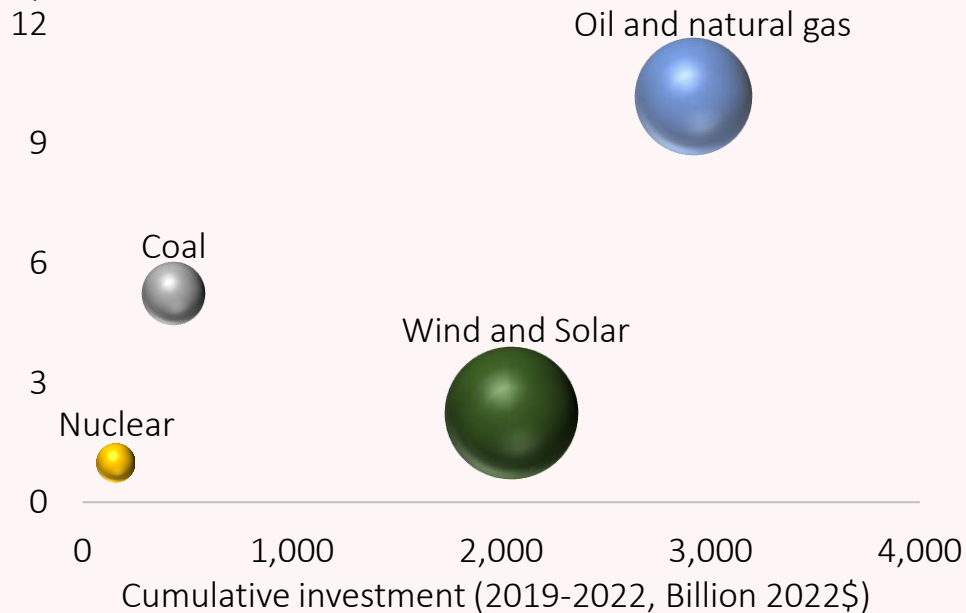


TXOGA Chart of the Week: Since 2019, global oil and natural gas investments have contributed 3X more per dollar invested than renewables

- Compare cumulative investments made between 2019 and 2022 in renewable power generation excluding grids, storage and electrification with those in oil and natural gas including midstream infrastructure. Next, consider the change in global energy consumption between 2019 and 2023, enabling these investments to be utilized
- Oil and natural gas contributed more than three times more energy per dollar invested, despite excluding infrastructure costs for renewables in power. Although investment efficacy is multifaceted by nature, a potential implication is that private sector oil and natural gas investments have been relatively more effective than government-driven global renewables investments

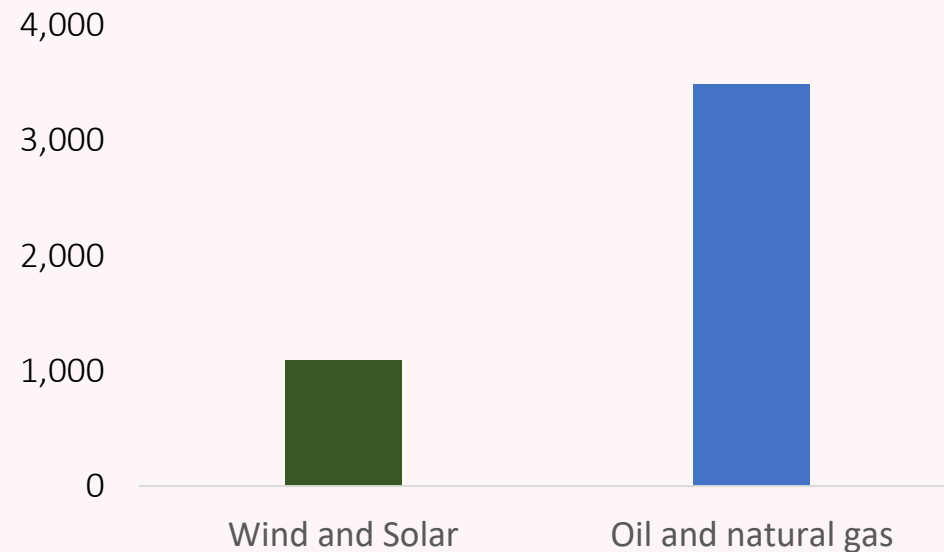
Global investment versus incremental energy consumption*

Quadrillion Btu



Incremental energy consumption per dollar invested since 2019*

Btu per dollar (2022\$)



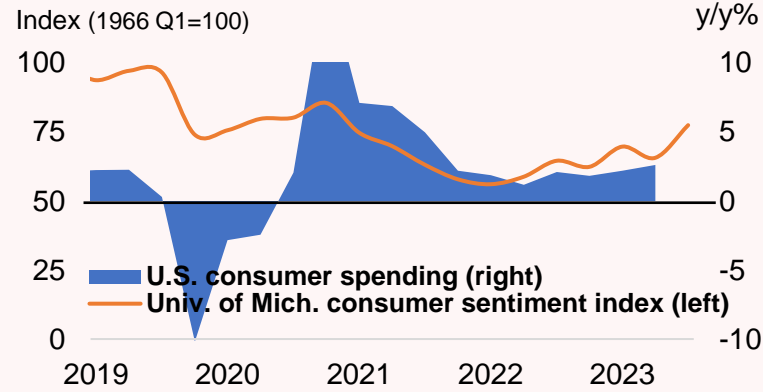
* Energy consumption change 2019 to 2023, compared with cumulative investments in 2019 to 2022.

Point size proportionate with estimated 2023 investment



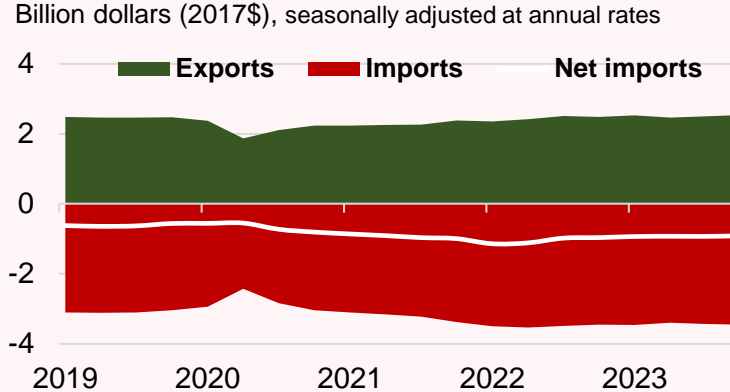
U.S. economic indicators

Consumer sentiment vs. spending



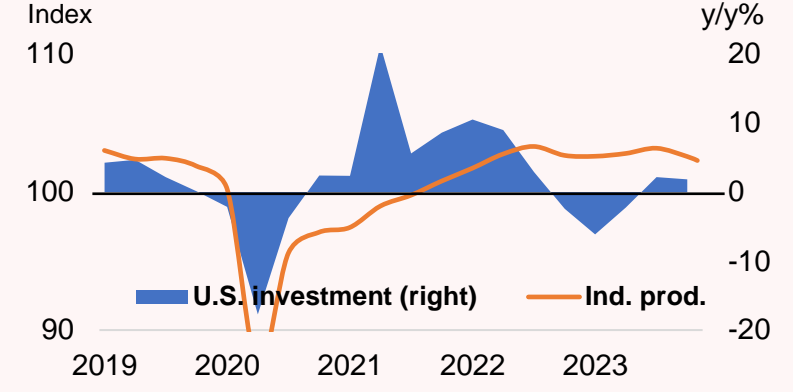
Consumer spending was revised upwards by 0.1% y/y to 2.7% y/y for Q4 2023 in the Feb. revision by BEA. The increased spending was consistent with improvement in the Univ. of Michigan's consumer sentiment index rose, which has since risen to 76.5 in the March reading and suggests further spending growth.

Real net exports of goods and services



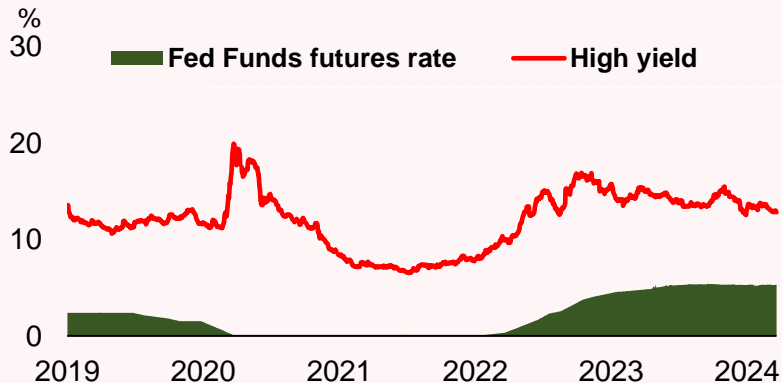
The U.S. trade deficit narrowed in Q4 2023. The U.S. real trade deficit ran at an annualized rate of \$908 billion in Q4 2023, down from \$931 billion in Q3 per the U.S. Bureau of Economic Analysis. On a nominal basis, the trade surplus for petroleum and products ran at annualized rate of \$16 billion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

Industrial production and investment growth



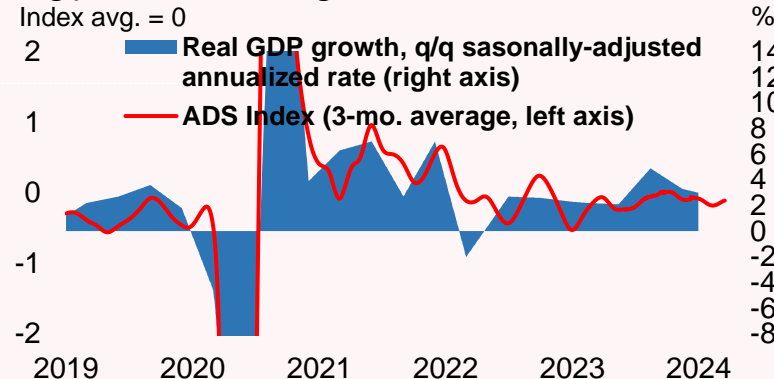
Industrial production edged up in Feb. 2024 and remained consistent with slow economy-side investment growth in Q1. Investment rose by 0.1% m/m in February per the Bureau of Economic Analysis.

Fed Funds rate and CCC and lower corporate bond yields



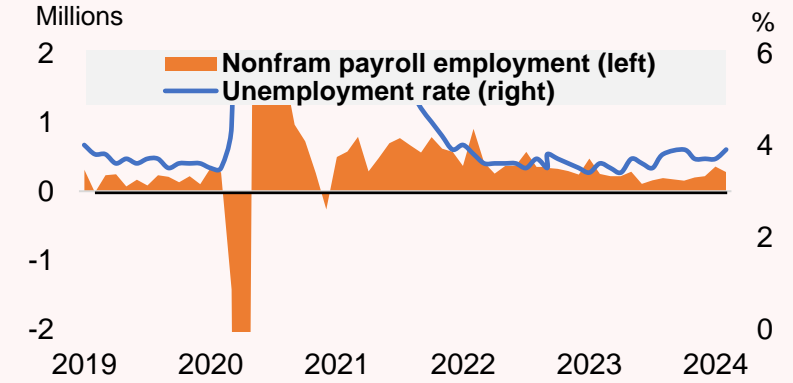
Decreased bond premium for low credit quality. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. For the week ended Mar. 22, HY rates held steady at 12.85% while the Fed Funds futures held steady at 5.3%, sustaining the lowest risk spread since December.

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



Business conditions show 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

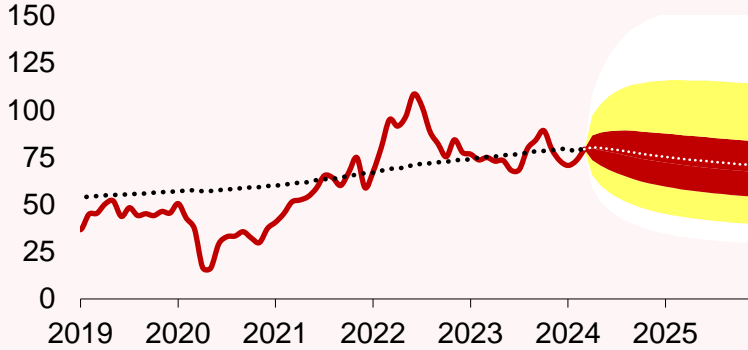


Higher unemployment rate despite payroll increases. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate rose to by 0.2% m/m to 3.9% in February per BLS, while non-farm payrolls rose by 275,000.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

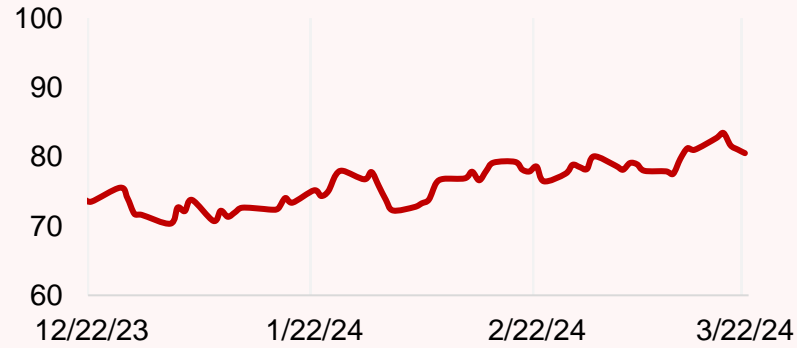
Dollars per barrel (2024\$)



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

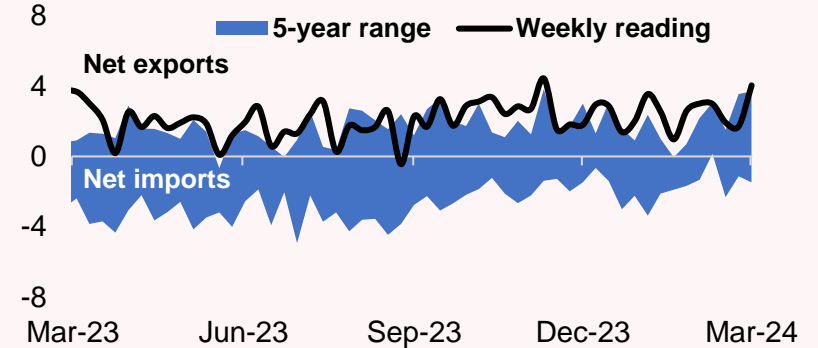
Dollars per barrel



WTI crude oil prices remained near \$80 per barrel for the week ended Mar. 22, supported by solid fundamentals and a Middle East geopolitical premium.

U.S. petroleum net exports (imports)

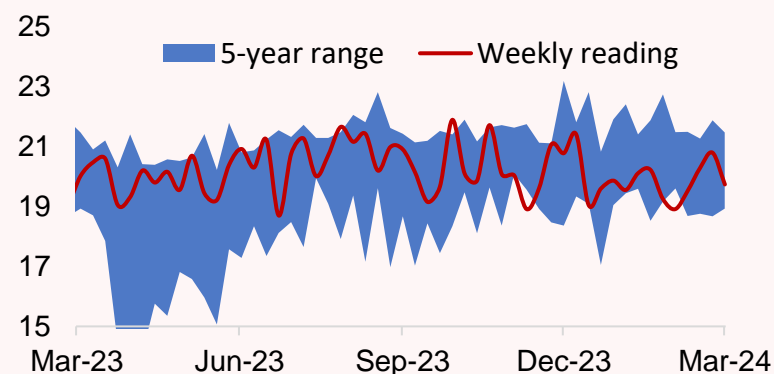
Million barrels per day, mb/d



Petroleum net exports rose. The U.S. was a petroleum net exporter of 4.1 mb/d for the week ended Mar. 15, up by 2.3 mb/d from the prior week and to the second greatest weekly net exports on record.

U.S. petroleum demand

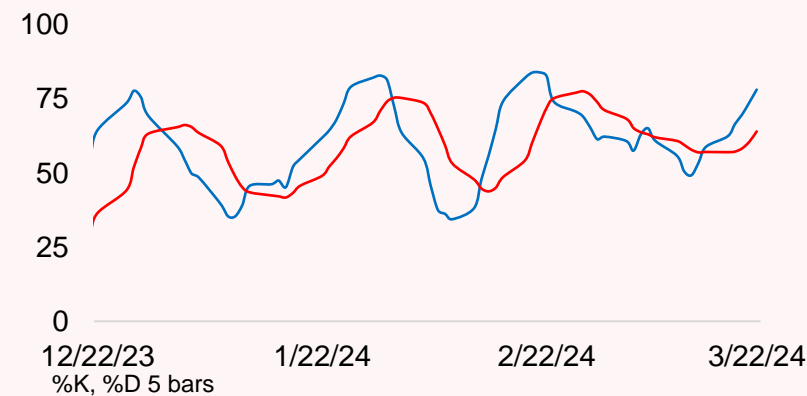
Million barrels per day (mb/d)



Petroleum demand decreased. U.S. petroleum demand, as measured by deliveries, fell by 1.1 mb/d w/w to 19.7 mb/d for the week ended Mar. 15.

WTI crude prompt month futures slow stochastic

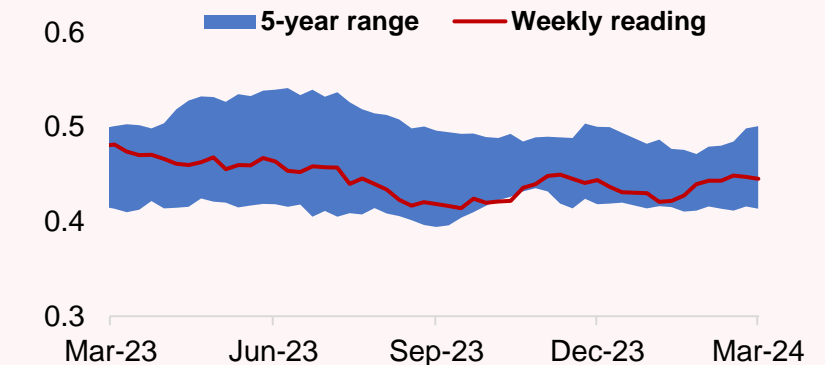
Index level



Price momentum neither increased nor decreased for the week ended Mar. 22.

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

Billion barrels (mb)

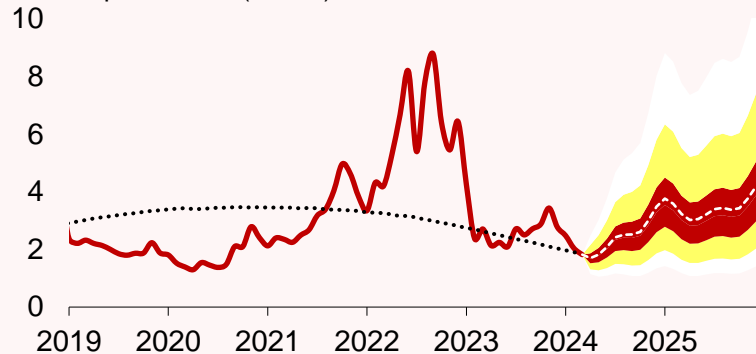


Inventories decreased. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) decreased by 2.0 million barrels (mb) for the week ended Mar. 15..

U.S. natural gas market indicators

Natural gas price mean reversion analysis

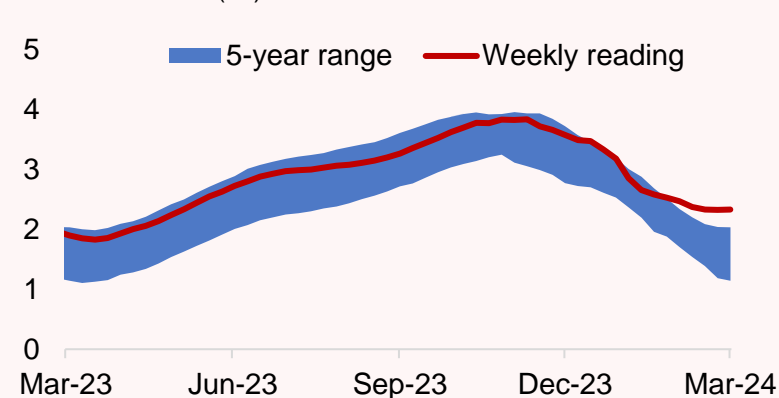
Dollars per mMBtu (2024\$)



The historical mean reversion target fell with recent low prices. Natural gas futures prices rise progressively beginning in May 2024. Confidence intervals based on past prices show the potential for greater upside than downside.

U.S. weekly working gas storage

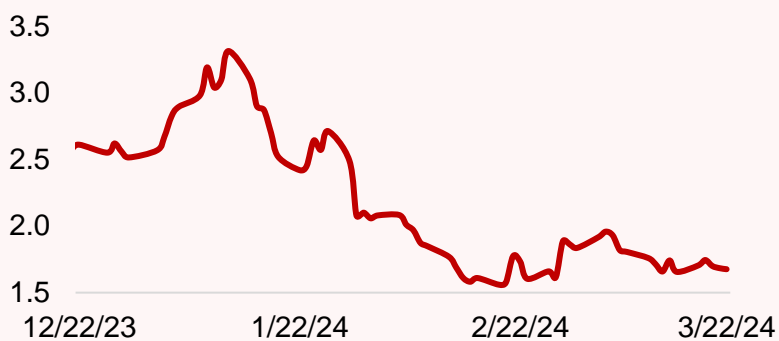
Trillion cubic feet (tcf)



Working gas in underground storage rose by 0.3% w/w to 2.33 tcf as of Mar. 15 and remained above the 5-year range.

Natural gas prompt month futures prices

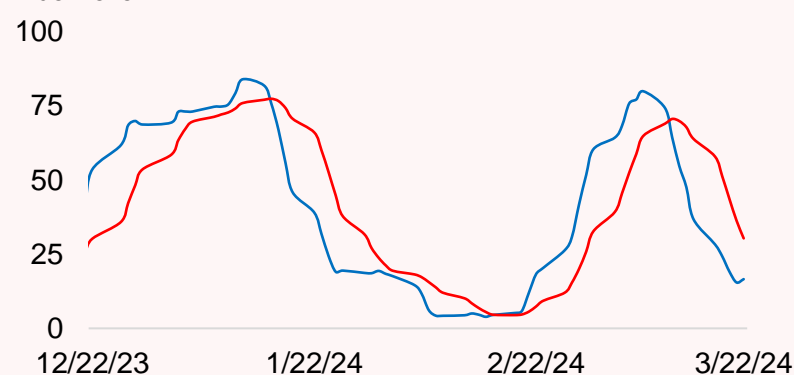
Dollars per million Btu



Natural gas prices at Henry Hub hovered near \$1.70 per million Btu for the week ended Mar. 22, thanks in part to storage levels that exceeded the 5-year range.

Natural gas futures slow stochastic

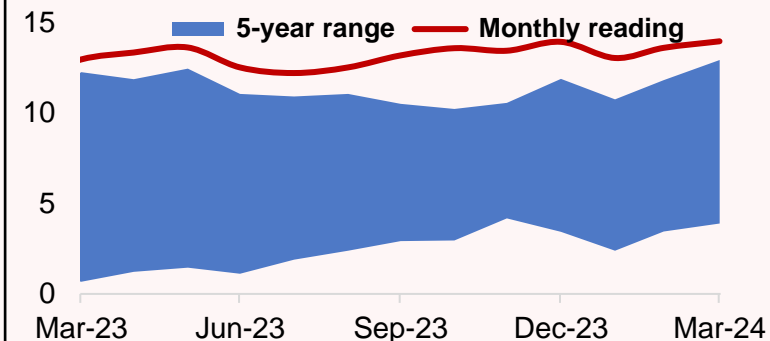
Index level



%K, %D 5 bars
Natural gas price momentum fell during the week ended Mar 22.

U.S. natural gas net exports

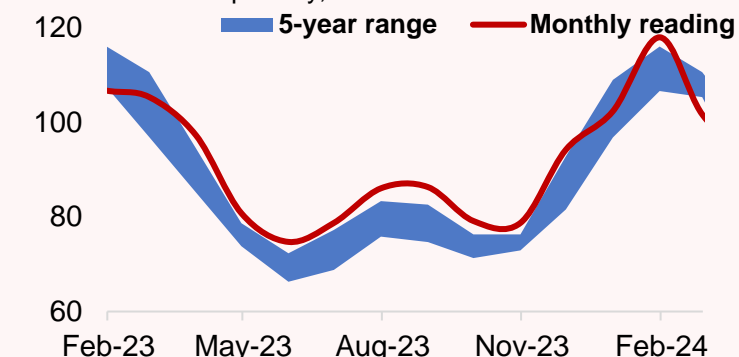
Billion cubic feet per day, bcf/d



Record-high exports. U.S. natural gas net exports in March are estimated at a record 14.0 bcf/d per EIA. Notably, LNG exports have held around 12 bcf/d, and the uplift to record levels has come from increased pipeline natural gas exports to Mexico and Canada, coupled with lower imports from Western Canada.

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

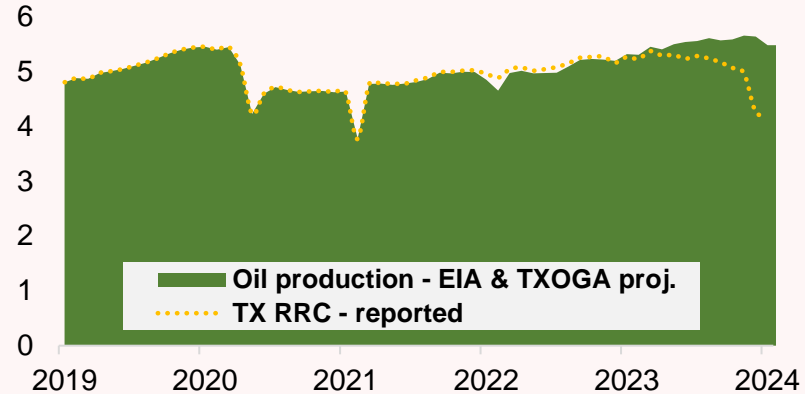


Consumption downgraded. EIA estimates that natural gas consumption fell from a record-high 118 bcf/d in January to 91.9 bcf/d in March, below the 5-year range with unseasonably warm weather.

Texas' oil and natural gas production

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

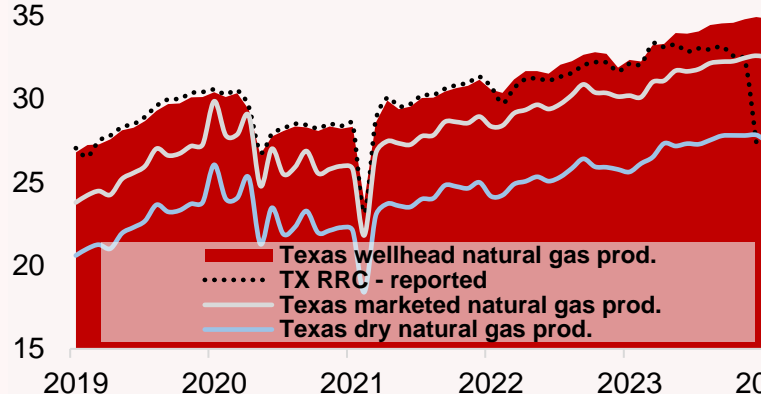
Million barrels per day (mb/d)



Oil production slipped from record highs. Texas' oil production of 5.6 mb/d in December was just below the record high set in Nov. per EIA. TXOGA estimates that Texas crude oil production eased further to 5.5 mb/d in January and February.

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

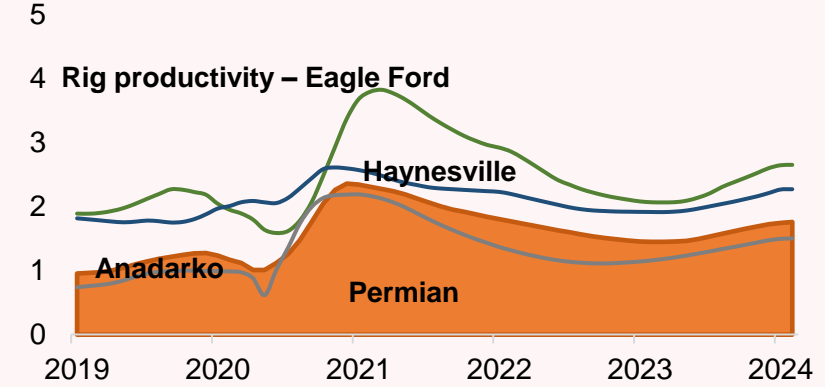
Billion cubic feet per day (bcf/d)



December production records. Texas' natural gas production of 34.9 bcf/d of gross withdrawals and 32.6 bcf/d of marketed production in December were record highs per EIA. TXOGA estimates that production decreased in February to 34.8 bcf/d of gross withdrawals, 32.4 bcf/d of marketed production, and 27.5 bcf/d of dry gas production.

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

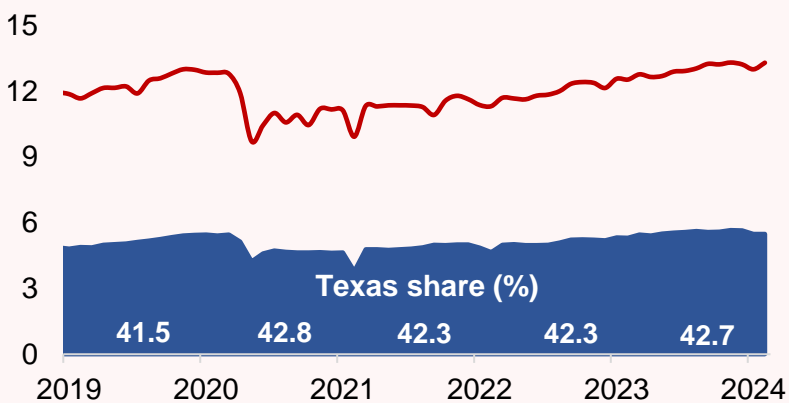
Thousand barrels per day oil-equivalent, kb/does



Strong productivity to start the year. EIA estimates of rig productivity for February 2024 show continued increases year-over-year across the major Texas basins, including the Anadarko (+29.6% y/y), Eagle Ford (+28.2% y/y), Permian (+21.4% y/y), and Haynesville (+18.6% y/y).

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

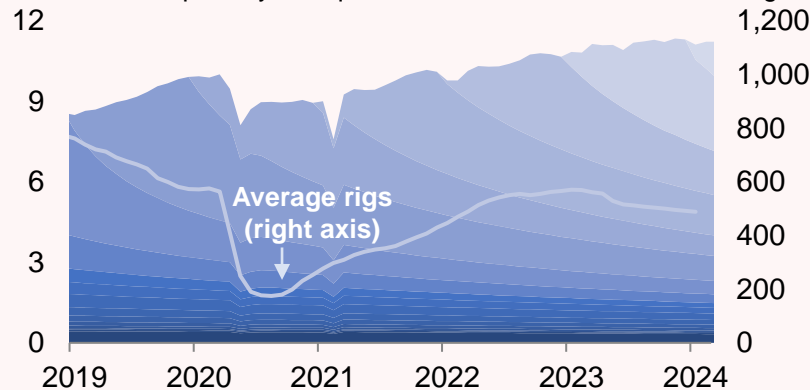
Million barrels per day (mb/d)



Texas' share rose. In 2023, Texas accounted for 42.7% of U.S. crude oil production, the highest share since 2020.

Texas shale basin wellhead oil & natural gas production

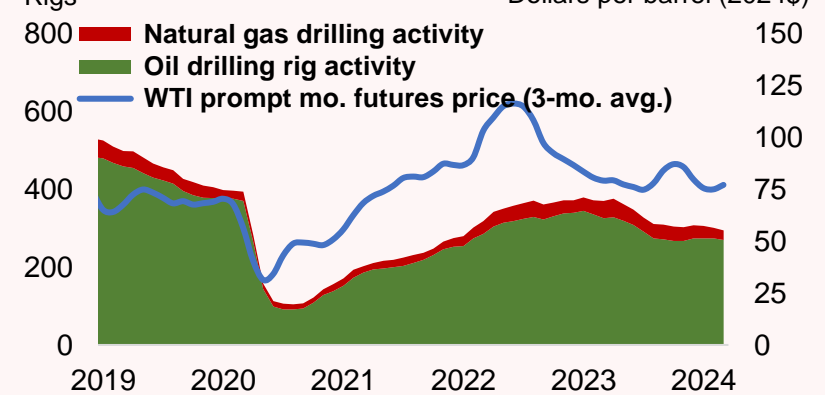
Million barrels per day oil-equivalent



EIA estimates Feb 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 (left axis), Dollars per barrel (2024\$) (right axis)



Texas' drilling rig activity remained steady on net for the week ended Mar. 22 per Baker Hughes. Texas had 270 oil-directed rigs (down by 1 rig w/w) and 24 natural gas-directed rigs (up by 1 rig w/w).

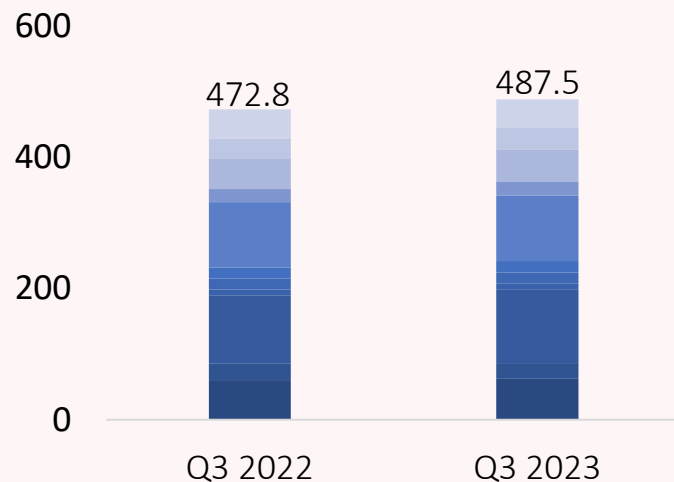
Texas' oil and natural gas industry's jobs and wages have continued to grow



- Texas' oil and natural gas industry employment rose by 3.1% y/y in Q3 2023 with half of the job growth in upstream support services and another nearly 20% in oil & gas field machinery and equipment manufacturing, per data the latest data (released on Feb. 21, 2024) from the U.S. Census Bureau and Texas Workforce Commission
- Q3 2023 industry wage growth of 3.6% y/y was nearly on par with job growth of 3.1% y/y, which reflected an easing of inflationary pressures

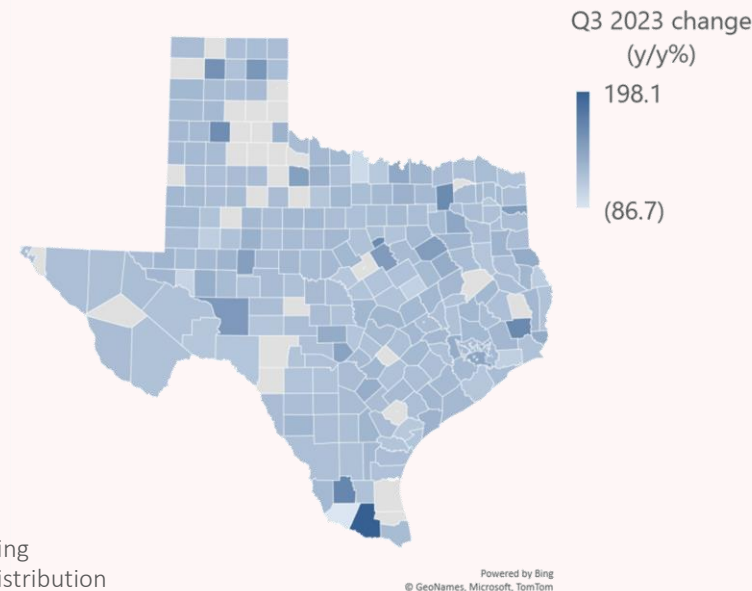
Texas oil and natural gas industry direct employment rose by +3.1% y/y in Q3 2023

Thousand Jobs



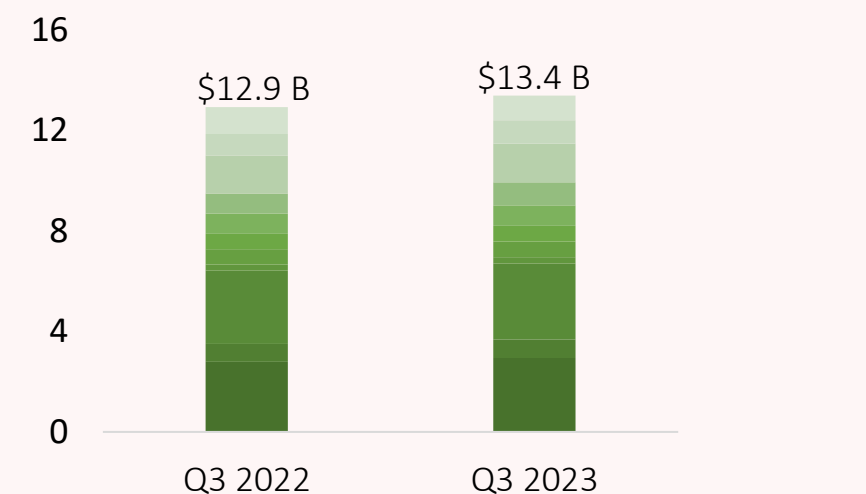
- Oil & gas extraction
- Support activities for o&g ops.
- Petroleum refineries
- Gas stations & fuel dealers
- All other*
- Pipeline construction
- Oil & gas drilling
- Natural gas distribution
- Petrochemical mfg.
- Pipeline transportation
- Oil & gas field mach. and eq. mfg.

* 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 +3.6% y/y in Q3 2023

Billion dollars



- Pipeline construction
- All other*
- Gas stations & fuel dealers
- Petroleum refineries
- Support activities for o&g ops.
- Oil & gas extraction
- Oil & gas field mach. and eq. mfg.
- Pipeline transportation
- Petrochemical mfg.
- Natural gas distribution
- Oil & gas drilling

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