



May 20, 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 May 20, 2024

- **Business strength remains robust, but consumer weakness is evident.** Consumer sentiment, as measured by the Univ. of Michigan's survey, fell by 13% month-over-month in May due to broad-based concerns about inflation, unemployment, and interest rates. Despite this, industrial production held steady in April, and business conditions have remained conducive to GDP growth in Q2 2024, based on the Philadelphia Federal Reserve's ADS Index.
- **Oil market fundamentals have tightened.** U.S. weekly data show crude production steady above 13 million barrels per day (mb/d), with petroleum demand and net exports at the top of their five-year ranges. This has resulted in an inventory drawdown of 2.5 million barrels as of May 10, according to the Energy Information Administration (EIA). West Texas Intermediate (WTI) oil prices have remained below \$80 per barrel despite these tighter market conditions and ongoing geopolitical uncertainties in the Middle East. As highlighted in the [Chart of the Week](#), oil and natural gas futures prices have recently reverted to their historical means.
- **Natural gas prices rose and aligned with their historical mean reversion target.** Consistent with our monitoring using mean reversion analysis, futures prices increased by nearly 60% over the past three weeks despite historically strong production and storage levels, which are currently 27% above the top of their five-year range. Futures prices currently rise by another 40% between the June and December contracts per CME Group, and confidence intervals based on past prices indicate a potential for greater upside than downside.
- **Employment and wages in Texas' oil and natural gas industry rose** by 1.9% year-over-year (y/y) and 5.8% y/y, respectively, in Q4 2023 to totals of **487,000 jobs and \$14.6 billion of wages**. This growth was led by gains in the upstream sector, wholesale and retail trade, and oil & gas field machinery and equipment manufacturing, according to the latest data released on May 16, 2024, from the U.S. Census Bureau and Texas Workforce Commission.

TXOGA Chart of the Week: Analysis of oil and natural gas price mean reversion

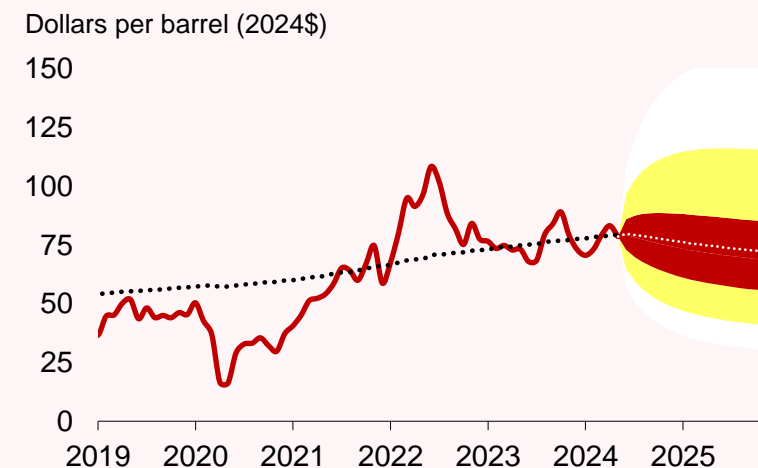
» Defining terms

- Mean reversion analysis can be useful to assess short-term markets, and fundamentals can cause prices tend to revert to their mean, even if the timing of potential reversion is uncertain.
- These analyses are not forecasts but show how futures prices (dotted white line) compare with a mean reversion target (dotted black line) and confidence intervals, based on past data.
- Historical variation and the tendency of prices to return to their mean inform the confidence intervals (red, yellow, and white ranges).

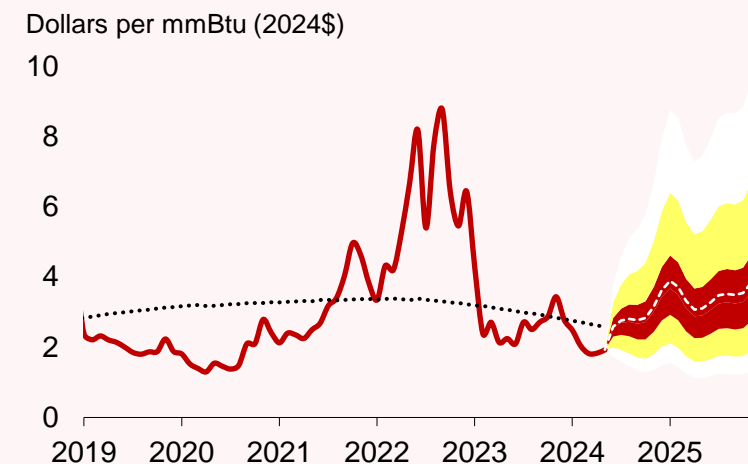
» Oil and natural gas prices have recently reverted to their historical means

- For WTI crude oil, the futures strip has remained backwardated (that is, futures prices currently are lower than spot prices). For natural gas, futures prices have risen by nearly 60% in the past three weeks and rise by another 40% between the contracts for delivery in June and December 2024.
- For both oil and natural gas, the confidence intervals show the potential for greater upside than downside.

WTI crude oil price mean reversion analysis

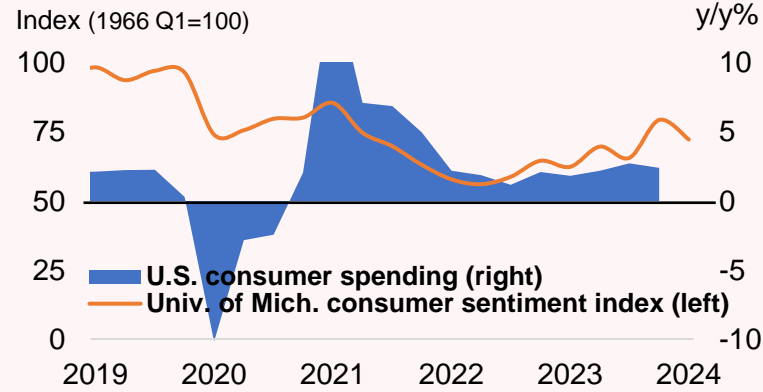


Natural gas price mean reversion analysis



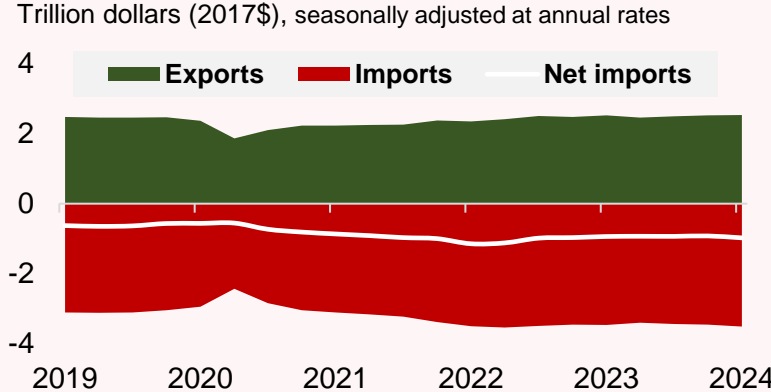
U.S. economic indicators

Consumer sentiment vs. spending



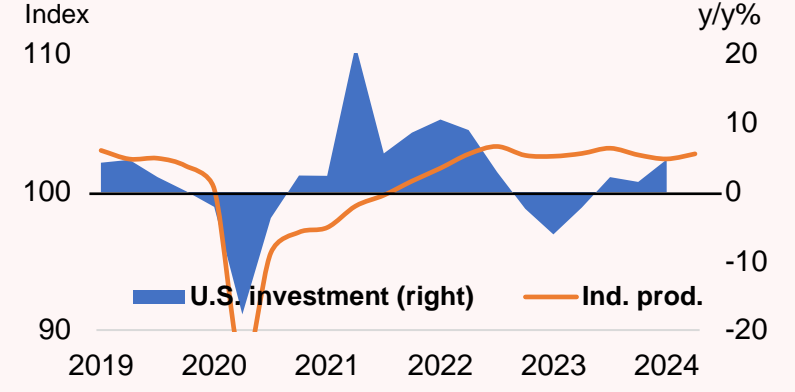
Consumer sentiment weakened so far in May, according to the University of Michigan's survey, but remains consistent with continued consumer spending growth in Q2 2024. The index fell to 67.4 in May's initial reading from 77.2 in April due to broad-based concerns for inflation, unemployment, and interest rates.

Real net exports of goods and services



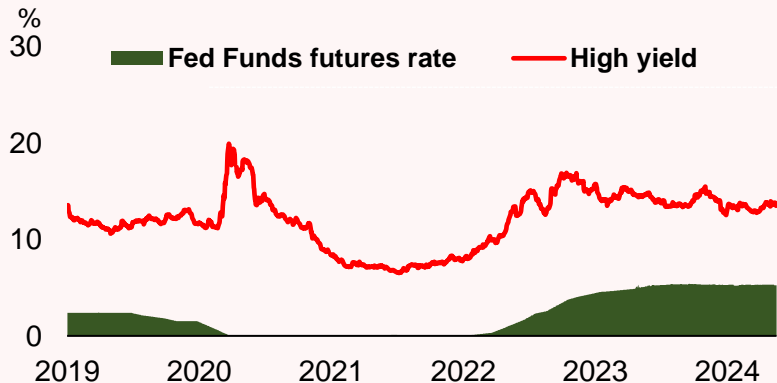
U.S. trade deficit revised to be larger. The U.S. real trade deficit ran at an annualized rate of \$973 billion in Q1 2023 per BEA initial estimates. On a nominal basis, the trade surplus for petroleum and products ran at annualized rate of \$52 billion in Q1 2024, up from \$36.7 billion a year ago, to the highest quarterly petroleum trade surplus on record.

Industrial production and investment growth



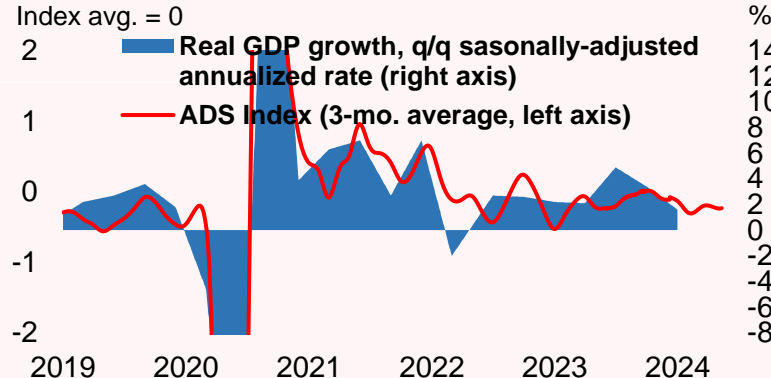
Industrial production remained steady in April and consistent with economy-side investment growth, which rose by 4.7% y/y in Q1 2024.

Fed Funds rate and CCC and lower corporate bond yields



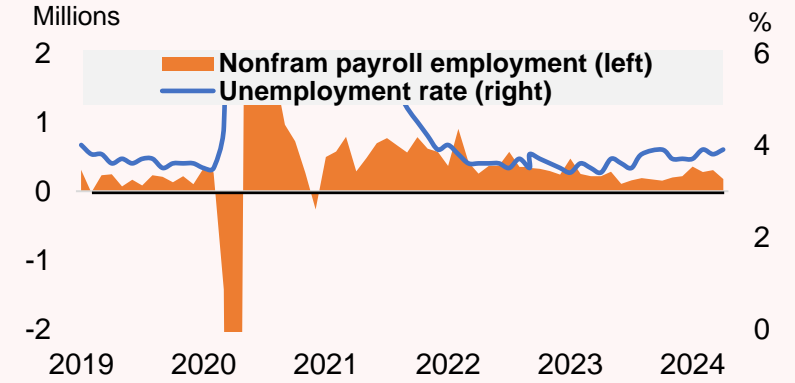
Bond premium for low credit quality slipped. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. For the week ended May 17, HY rates fell by 0.3% w/w to 13.5%, and Fed Funds futures remained steady near 5.3%, lowering the premium for low credit quality to 8.3%.

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



Real GDP growth has continued to grow in line with the ADS index. 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 growth in Q1 2024 real GDP and remains consistent with GDP growth in Q2.

Nonfarm payroll employment & unemployment rate

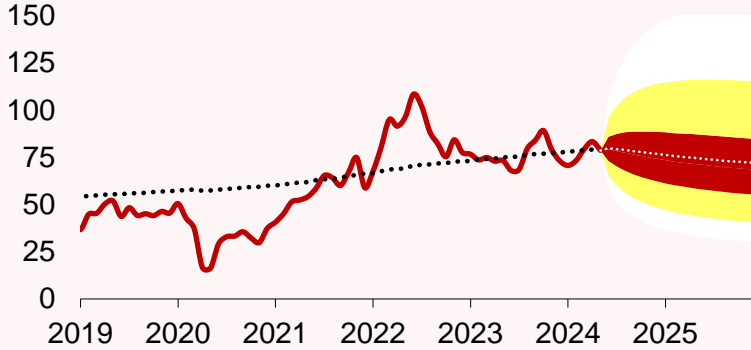


Lukewarm labor market growth. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate rose by 0.1% m/m to 3.9% in April per BLS, while non-farm payrolls increased by 175,000.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

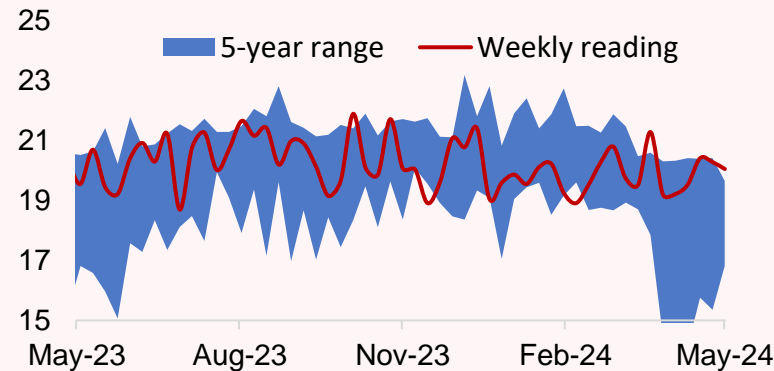
Dollars per barrel (2024\$)



Near-term futures prices currently align with the historical mean reversion target. 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.

U.S. petroleum demand

Million barrels per day (mb/d)



Petroleum demand remained historically strong. U.S. petroleum demand, as measured by deliveries, decreased by 0.2 mb/d w/w to 20.1 mb/d for the week ended May 10 and exceeded the five-year range.

WTI crude prompt month futures prices

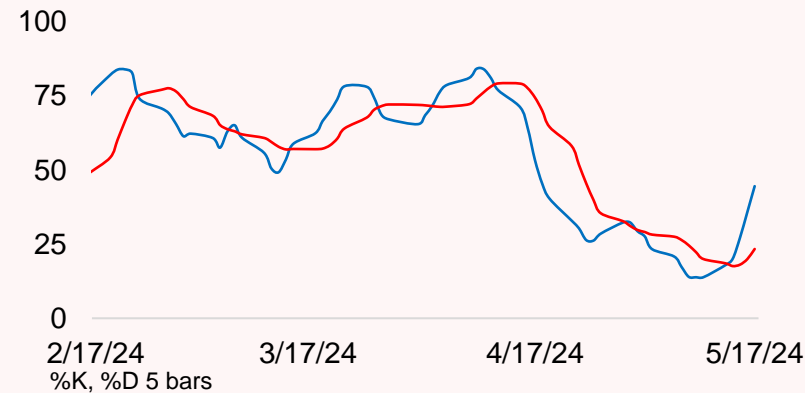
Dollars per barrel



WTI crude oil prices remained near \$79 per barrel for the week ended May 17, reflecting historically solid production and inventories despite strong demand, exports, and Middle East geopolitical uncertainties.

WTI crude prompt month futures slow stochastic

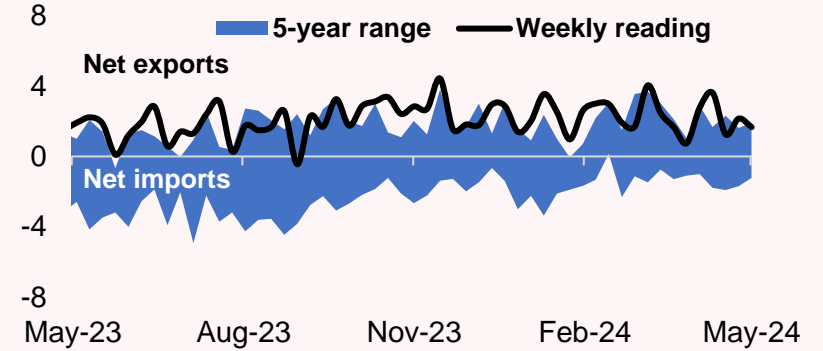
Index level



Price momentum initially weakened but then turned positive during the week ended May 17.

U.S. petroleum net exports (imports)

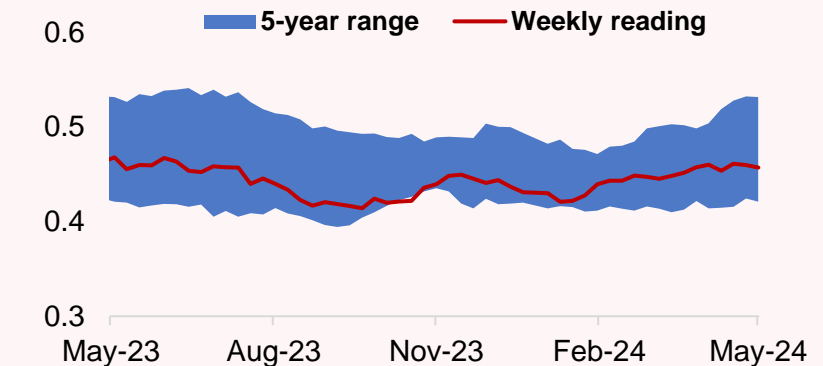
Million barrels per day, mb/d



Petroleum net exports fell. The U.S. was a petroleum net exporter of 1.7 mb/d for the week ended May 10, down by 0.5 mb/d from the prior week.

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

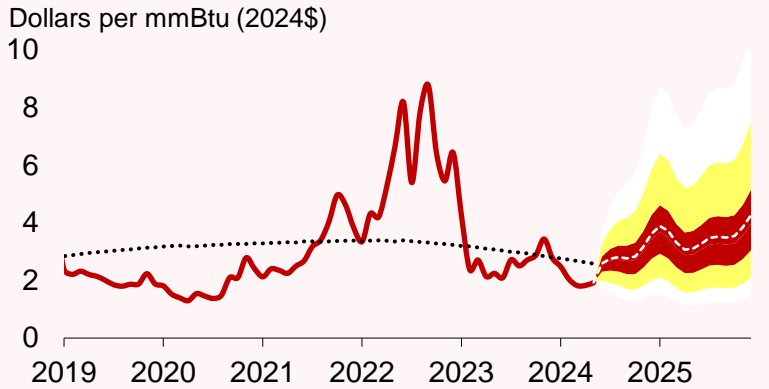
Billion barrels



Inventories decreased. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) decreased by 2.5 million barrels (mb) for the week ended May 10.

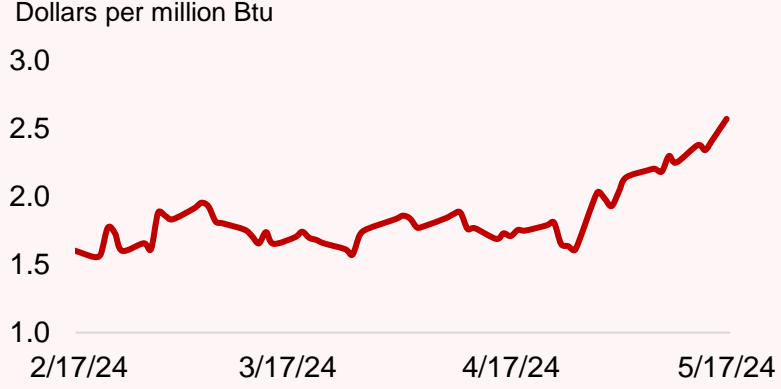
U.S. natural gas market indicators

Natural gas price mean reversion analysis



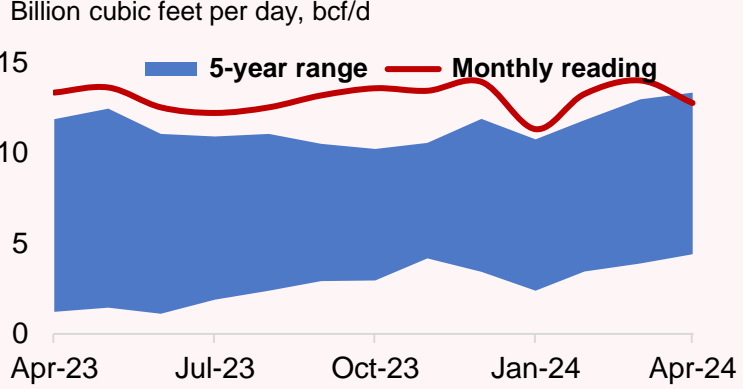
Near-term natural gas futures have risen to align with the historical mean reversion target but rise by 40% between the June and December contracts. Confidence intervals based on past prices show the potential for greater upside than downside.

Natural gas prompt month futures prices



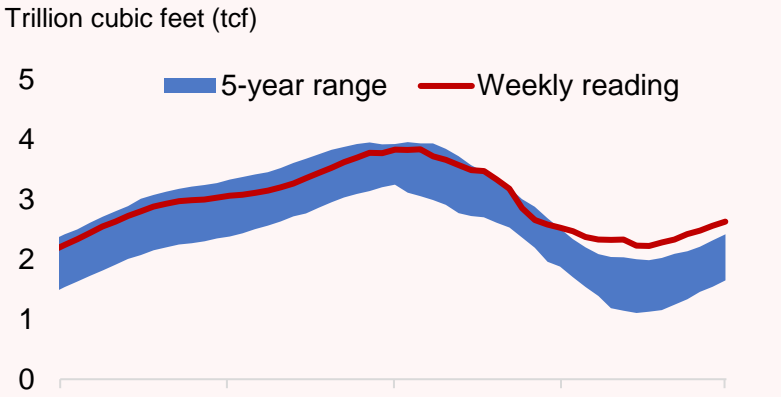
Natural gas prices at Henry Hub continued to rise are up by nearly 60% over the past three weeks to around \$2.60 per million Btu for the week ended May 17 despite historically strong inventory increases.

U.S. natural gas net exports



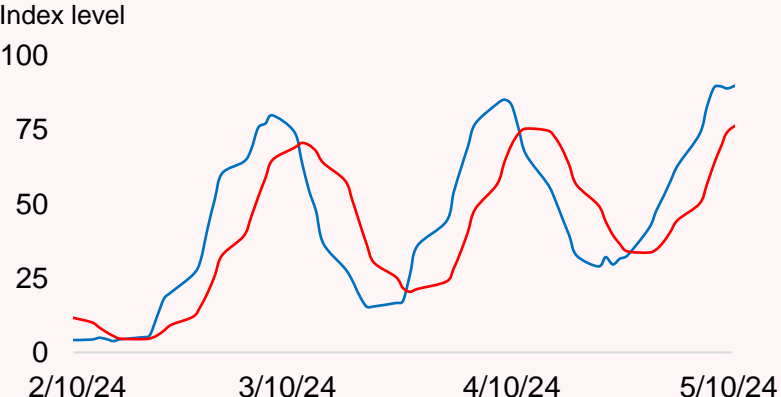
Natural gas exports slipped. U.S. natural gas net exports in April 12.8 bcf/d, down from an upward-revised record-high of 14.0 bcf/d in March per EIA.

U.S. weekly working gas storage



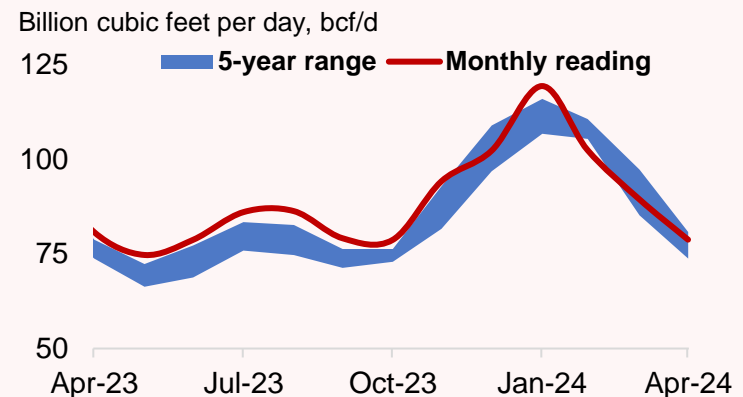
Working gas in underground storage rose by 2.7% w/w to 2.63 tcf as of May 10 and remained above the 5-year range.

Natural gas futures slow stochastic



Natural gas price momentum increased during the week ended May 17.

U.S. natural gas consumption



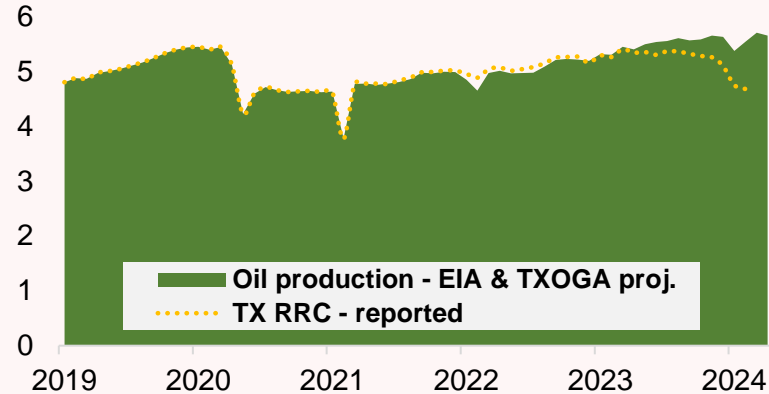
Consumption decreased. U.S. natural gas consumption of 79.0 bcf/d in April came in below EIA's projection and was down from 80.7 bcf/d a year ago.



Texas' oil and natural gas production

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

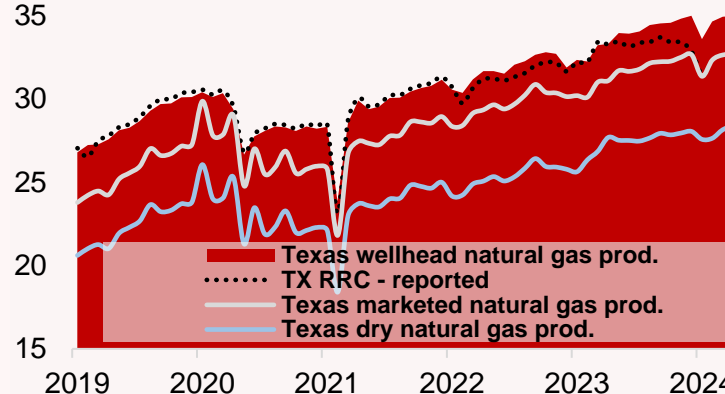
Million barrels per day (mb/d)



Oil production increased. Texas' oil production of 5.6 mb/d in February and rebounded following Winter Storm Heather in January per EIA. TXOGA estimates that Texas crude oil production rose to 5.7 mb/d in March and April.

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

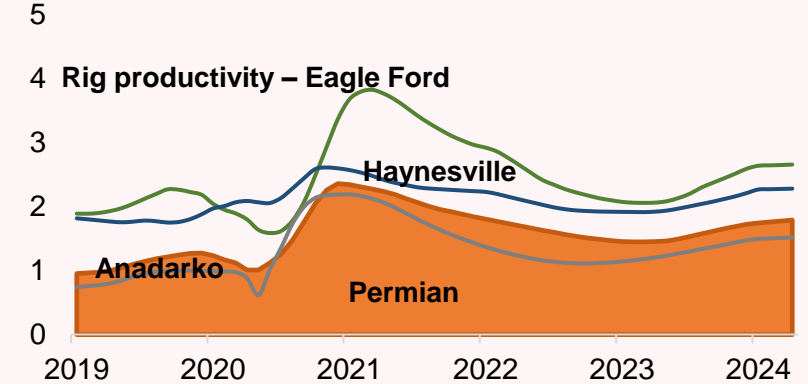
Billion cubic feet per day (bcf/d)



Natural gas production increased. Texas' natural gas production of 34.6 bcf/d of gross withdrawals and 32.3 bcf/d of marketed production in Feb. were impacted by Winter Storm Heather per EIA. TXOGA estimates that production rose in April to 35.0 bcf/d of gross withdrawals, 32.7 bcf/d of marketed production, and 28.4 bcf/d of dry gas production.

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

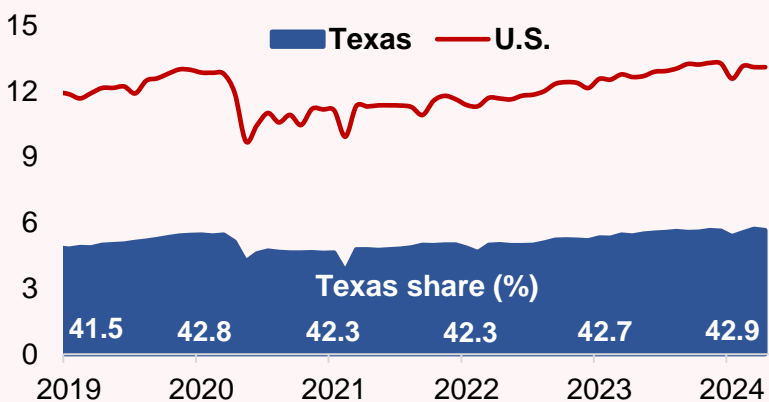
Thousand barrels per day oil-equivalent, kb/dae



Strong productivity to start the year. EIA estimates of rig productivity for April 2024 show continued increases year-over-year across the major Texas basins, including the Anadarko (+25.7% y/y), Eagle Ford (+28.8% y/y), Permian (+23.3% y/y), and Haynesville (+18.7% y/y).

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

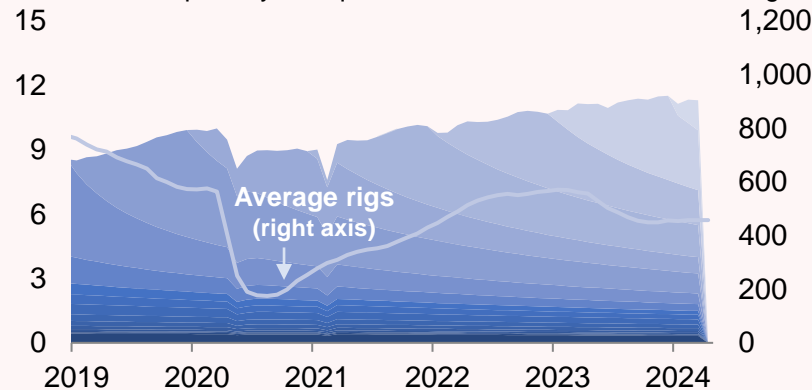
Million barrels per day (mb/d)



Texas' share increased. Texas accounted for an estimated 42.9% of U.S. crude oil production year-to-date through April.

Texas shale basin wellhead oil & natural gas production

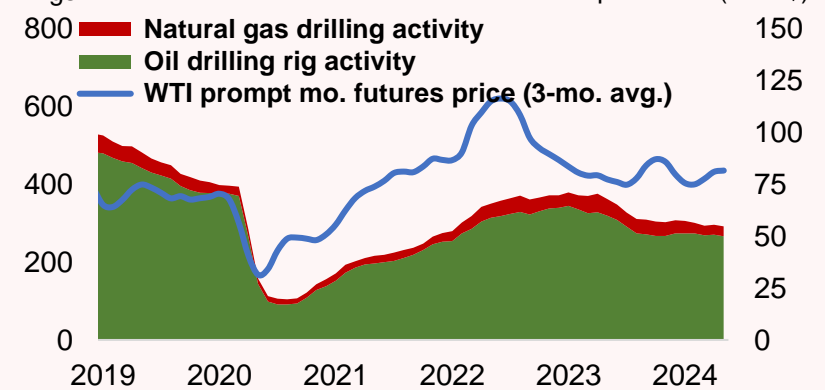
Million barrels per day oil-equivalent



EIA estimates Apr. 2024 production growth across Texas shale basins has continued to grow year-over-year in the Permian (+6.5% y/y) but fallen in the Eagle Ford (-0.1% y/y), Haynesville (-2.8% y/y), and Anadarko (-2.6% 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 increased for the week ended May 17 per Baker Hughes. Texas had 263 oil-directed rigs (down by 1 rig w/w) and 27 natural gas-directed rigs (up by 2 rigs w/w).

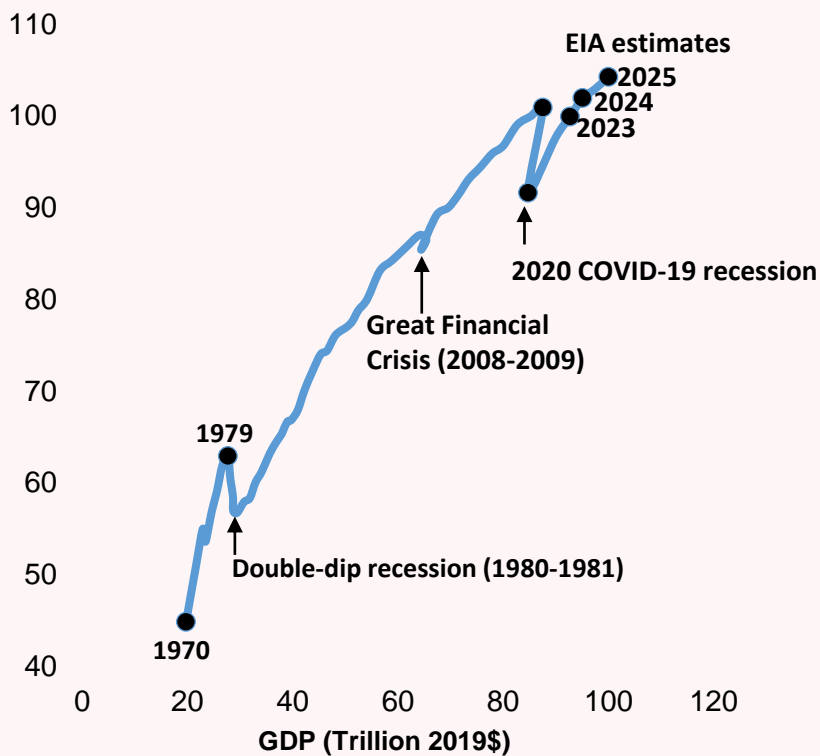
Global Oil Market Balance Projections to 2025



- Record-high global oil demand of 102.9 mb/d in 2025 and 104.3 mb/d in 2025, which reflect upgrades from last quarter corresponding with stronger economic growth per EIA
- For oil inventories, the EIA projects global stock withdrawals with a deficit of 0.3 mb/d in Q2 2024, corresponding with Brent crude oil prices of \$87.79 in 2024, compared with \$83.62 per barrel currently.

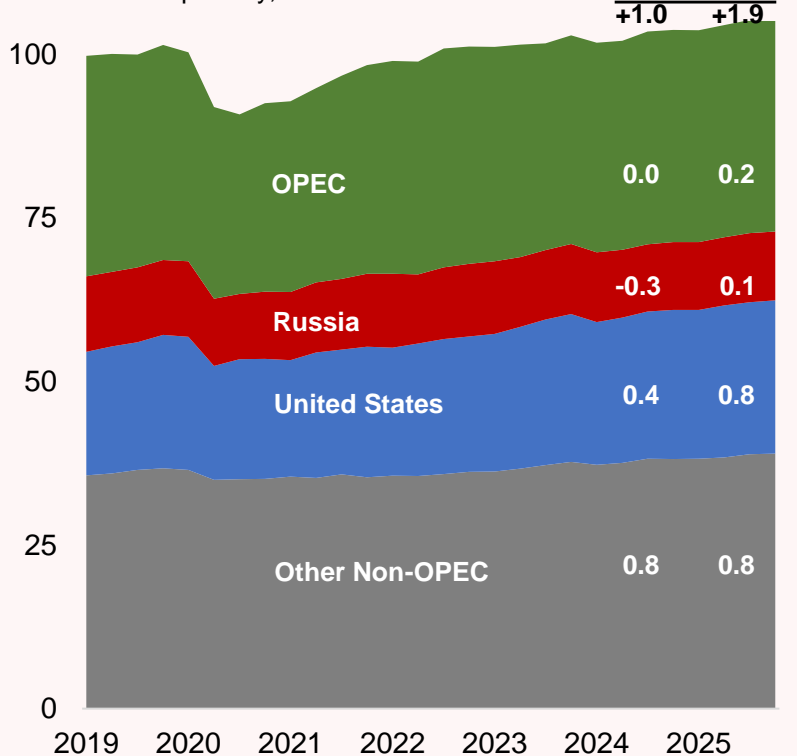
Global oil demand and GDP

Million barrels per day (mb/d)



Oil production by country/region

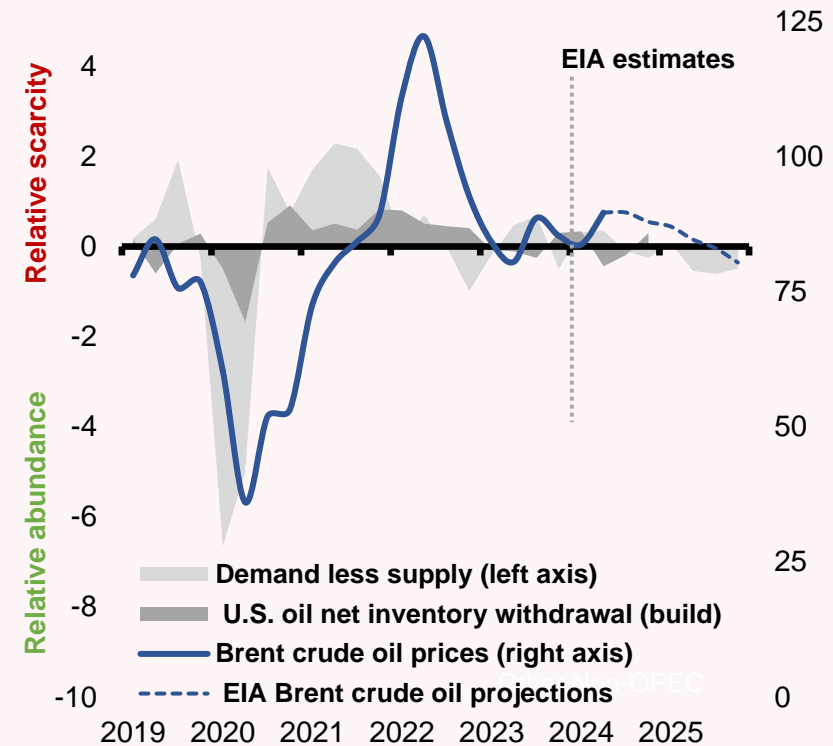
Million barrels per day, mb/d



Global demand/supply & Brent prices

Million barrels per day (mb/d)

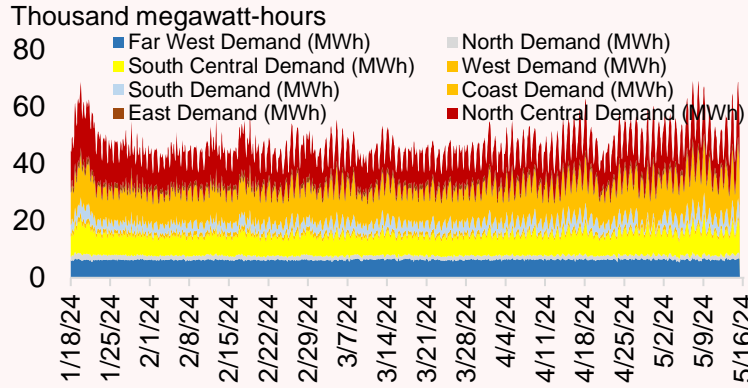
2024\$/Bbl



Texas Electricity Analysis

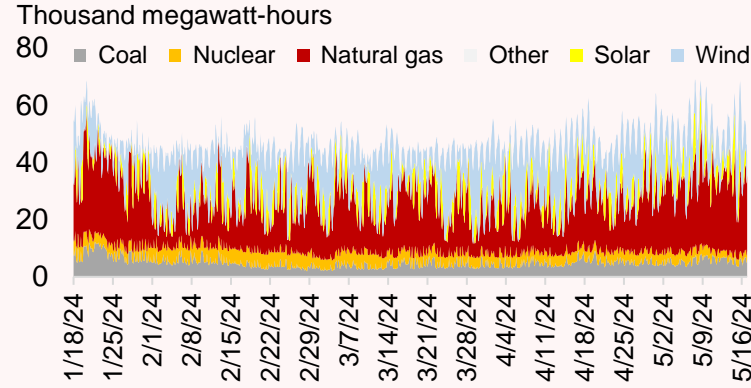


ERCOT electricity load by region



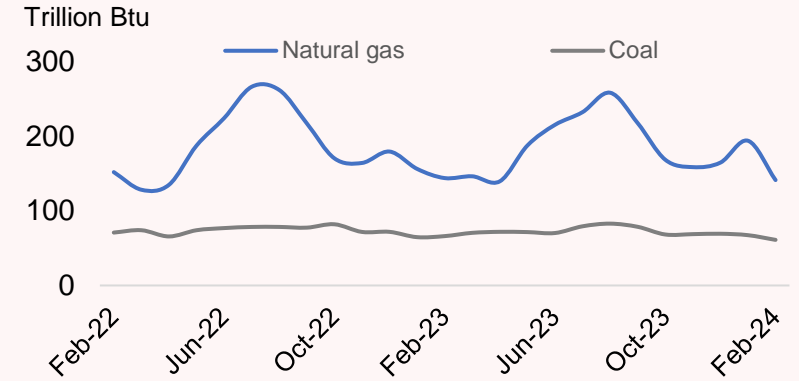
North and West Texas load increased. For May 10-17, 2024, ERCOT's average hourly electricity load fell by 1.8% w/w, while the maximum hourly load of slipped by 0.6 w/w. Variability rose to an average percentage standard deviation of 20% in the East, North Central, and South Central regions.

ERCOT hourly electricity generation by source



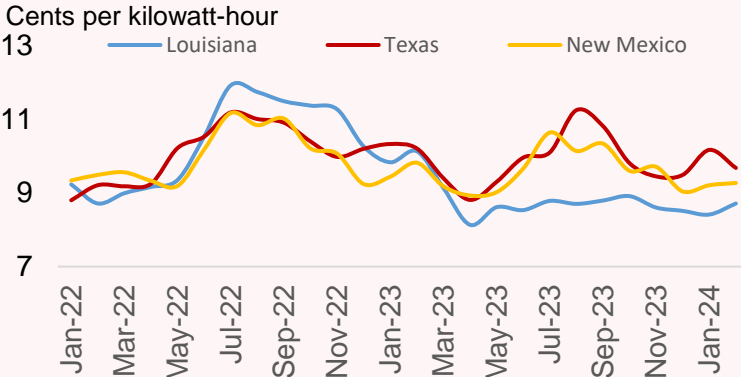
ERCOT thermal generation fell. ERCOT's hourly electricity generation for the period May 10-17 ranged between 39 and 69 kMWh with a percentage standard deviation of 13.7, steady from the prior week. Thermal sources contributed as much as 91% of the region's power (up by 2% w/w), and natural gas drove as much as 70% over the period (up by 5% w/w).

Electricity plant receipts of natural gas and coal



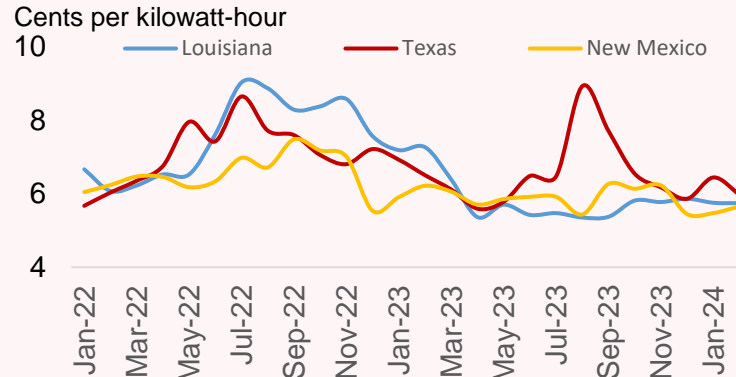
Texas' lower natural gas receipts enabled by higher inventories. Although Texas' thermal and dispatchable energy needs have continued to grow, the maximum monthly quantities of natural gas and coal that generators received have fallen over the past two years, thanks at least in part to greater inventories. In the latest data, Texas' natural gas storage of 687 bcf in Feb. 2024 increased by 143 bcf (26.4%) versus its level in Feb. 2022.

Electricity prices – average across all end-use sectors



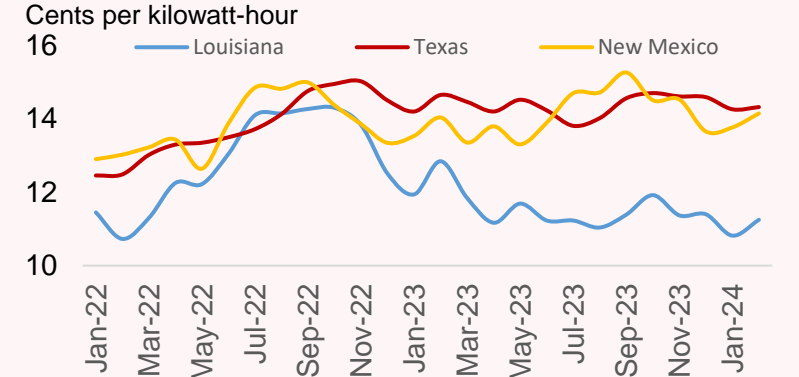
Texas' electricity prices fell in February. The average price of electricity in Texas decreased by 4.8% m/m in February. However, Texas' average price remained 4.4% and 11.1% higher than those in Louisiana and New Mexico, respectively.

Industrial electricity prices



Texas' industrial electricity prices decreased. For Texas' industrial consumers, the average price of electricity fell by 8.2% m/m in February. However, Texas' average price remained 4.0% and 5.7% higher than those in Louisiana and New Mexico, respectively.

Residential electricity prices



Texas' residential electricity prices increased. For Texas' residential consumers, the average price of electricity rose by 0.4% m/m in February. Texas' average price remained 27.2% higher than that in Louisiana and 1.2% higher than that in New Mexico.

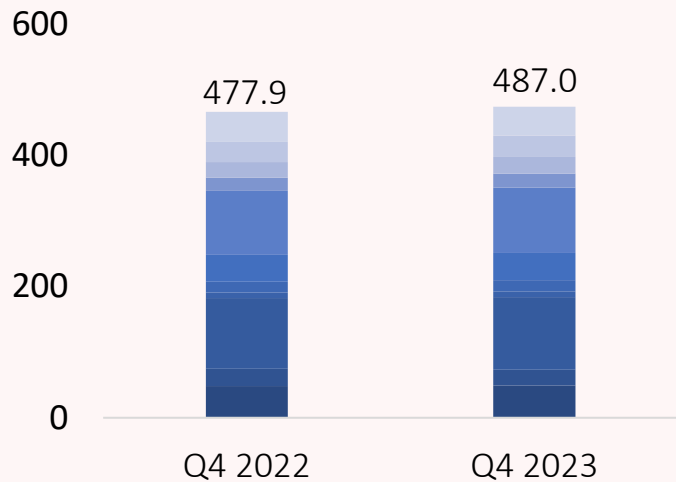
Texas' oil and natural gas industry wages reached \$14.6 billion in Q4 2023



- ▶ Texas' oil and natural gas industry employment and wages grew by 1.9% y/y and 5.8% y/y, respectively, in Q4 2023, raising the totals to over 487,000 jobs and \$14.6 billion in wages – the highest fourth quarter wages on record.
- ▶ Over 40% of the job growth occurred in the upstream and supporting services, 25% in petroleum wholesale and retail trade, and 20% in oil & gas field machinery and equipment manufacturing per data the latest data (released on May 16, 2024) from the U.S. Census Bureau and Texas Workforce Commission.

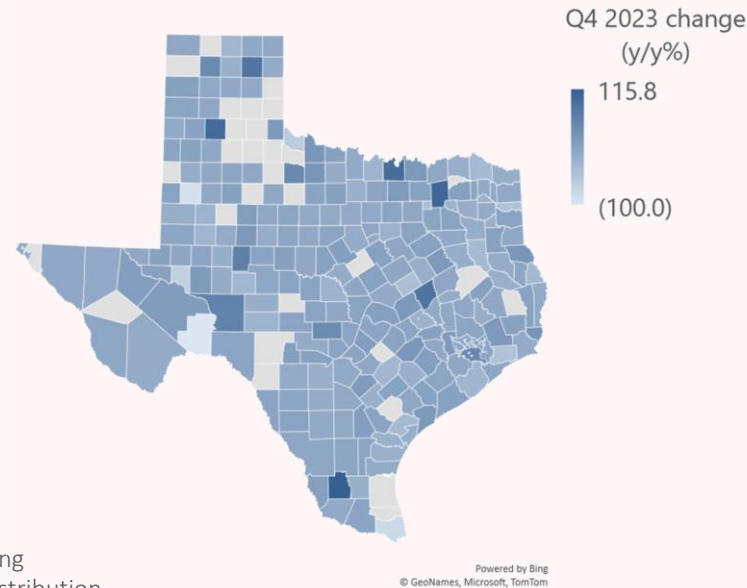
Texas oil and natural gas industry direct employment rose by +1.9% y/y in Q4 2023

Thousand Jobs



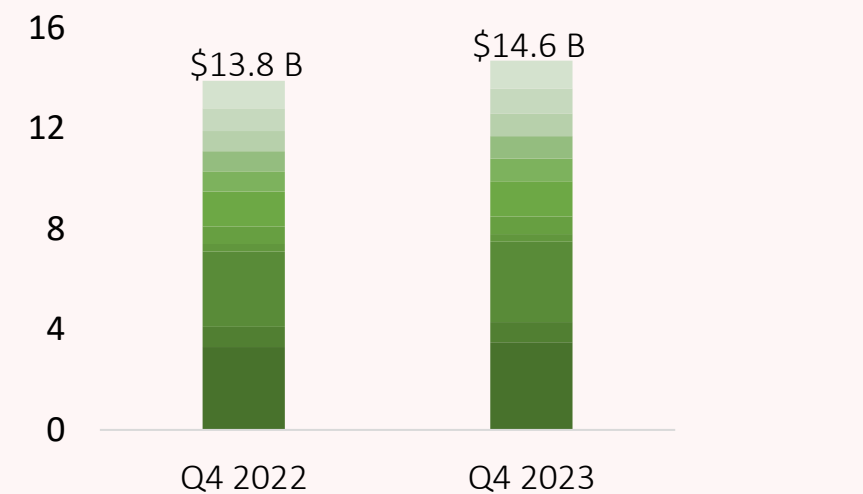
- Oil & gas extraction
- Support activities for o&g ops.
- Petroleum refineries
- Gas stations & fuel dealers
- All other*
- Pipeline construction
- Oil & gas drilling
- Natural gas distribution
- Petrochemical mfg.
- Pipeline transportation
- Oil & gas field mach. and eq. mfg.

* 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 +5.8% y/y in Q4 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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