TXOGA CHARTBOOK™

April 8, 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.

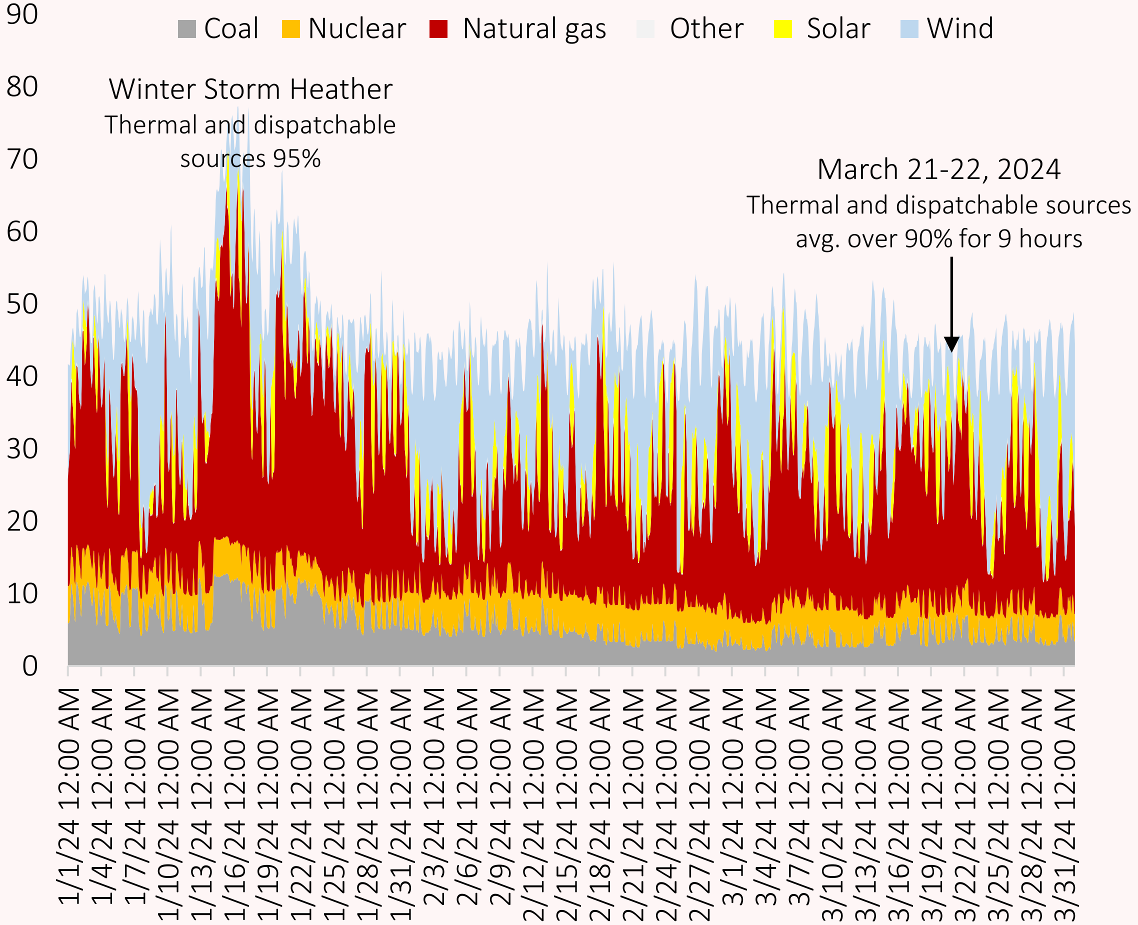
Key points for the week of April 8, 2024

- **U.S. economic indicators strengthened, spurring higher long-term interest rates.** Consumer sentiment rose according to the Univ. of Michigan's final survey for March, reflecting confidence in the economy and expectations for further softening of price inflation. The labor market remained robust, with the unemployment rate dropping by 0.1% to 3.8%, and non-farm payrolls up by 303,000, in March. However, these positive indications reinforced market expectations for no Federal Funds rate cuts, so Fed Funds futures remained unchanged at 5.3% while longer-term yields on high-yield corporate bonds rose by 0.4% week-over-week to 13.3%, marking the first risk premium for low credit quality of 8% or higher since February.
- **Oil market conditions were mixed.** Geopolitical tensions supported oil prices above $80 per barrel for the 3rd consecutive week for the first time since Oct. 2023. Data from the Energy Information Administration (EIA) for the week ended Mar. 29 indicated U.S. petroleum demand rose to 21.3 million barrels per day (mb/d), while petroleum net exports fell to 1.7 million barrels per day. These levels likely were influenced by seasonal factors associated with the holiday period but resulted in domestic crude oil inventories increasing by 3.2 million barrels for the week.
- **ERCOT's high reliance on thermal generation amid rising electricity rates.** The Chart of the Week shows how thermal and dispatchable sources were crucial during Winter Storm Heather, providing up to 95% of ERCOT's electricity, but also in late March, supplying over 90% of power for nine consecutive hours—a period more than twice the duration required for ERCOT's Contingency Reserve Service (ECRS) and substantially all grid-scale battery storage. Moreover, Texas faces higher industrial electricity rates and increasing needs for thermal and dispatchable generation, with natural gas remaining the most economical option due to record-low real prices in Q1 2024.

TXOGA Chart of the Week: For ERCOT, the criticality of thermal and dispatchable generation extends beyond extreme weather events

ERCOT hourly electricity generation by source, 1/1/24– 3/31/24

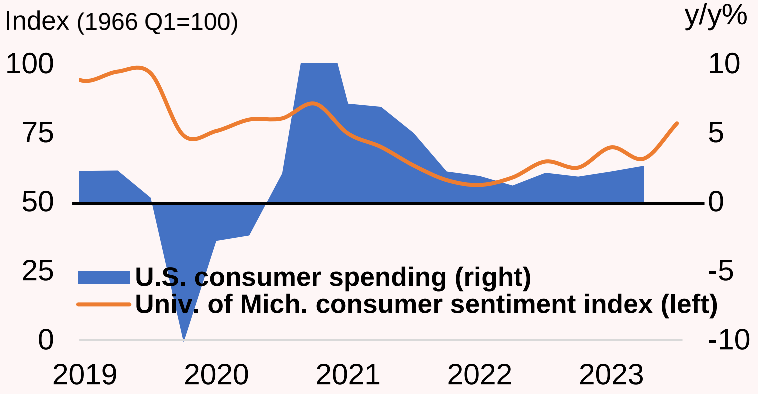
Thousand megawatt-hours



- During Winter Storm Heather on January 13-16, 2024, thermal and dispatchable sources generated as much as **95%** of ERCOT's electricity
- On March 21-22, 2024, thermal and dispatchable sources generated **over 90%** of ERCOT's electricity for **nine consecutive hours** and averaged **91.8%** of the region's power
- Notably, **nine consecutive hours** of over 90% reliance on thermal and dispatchable generation equates to more than four times the duration that ERCOT requires eligibility to participate in ERCOT's Contingency Reserve Service (ECRS) ancillary service
- **Nine consecutive hours** is also more than twice the duration of more than 90% of all U.S. grid-scale battery storage per [NREL]
- Separately, Texas' average industrial electricity rates stand nearly 14% higher than they were two years ago and are now 10.7% and 15.1% above those in Louisiana and New Mexico, respectively, per EIA in Jan. 2024.
- Consequently, there's a continuing and growing need thermal and dispatchable electricity generation in Texas, and at record-low real natural gas prices in Q1 2024, natural gas is the most economic solution

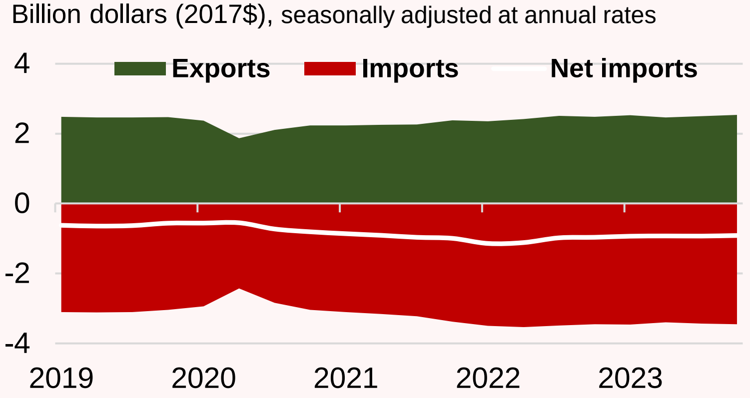
U.S. economic indicators

Consumer sentiment vs. spending



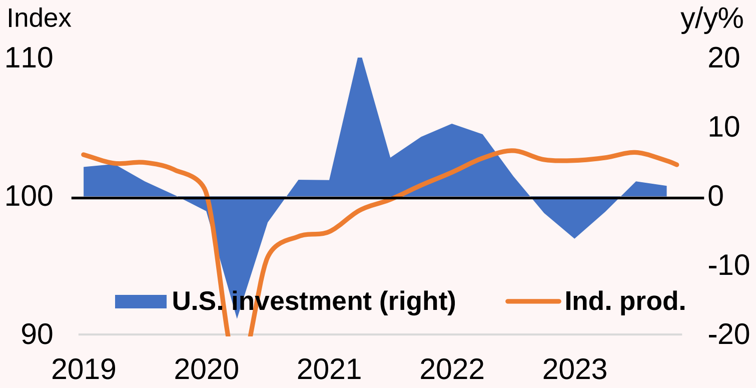
Consumer sentiment was revised upwards by 3.7% to an index reading of 79.4 in Univ. of Michigan's final March 2024 survey. Improved consumer sentiment has corresponded with consumer spending growth, which rose by 2.7% y/y in the final revision of GDP for Q4 2023 per BEA. The continued improvement of consumer sentiment is historically consistent with further spending growth.

Real net exports of goods and services



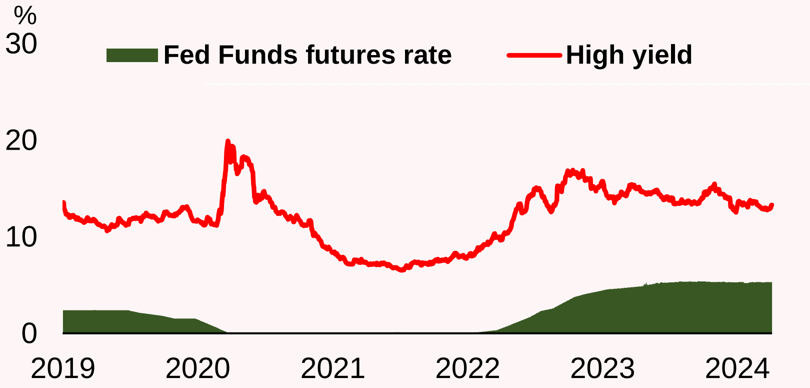
U.S. trade deficit revised to be larger. The U.S. real trade deficit ran at an annualized rate of $919 billion in Q4 2023 per BEA's revised estimates. On a nominal basis, the trade surplus for petroleum and products ran at annualized rate of $31 billion in Q4 2023.

Industrial production and investment growth



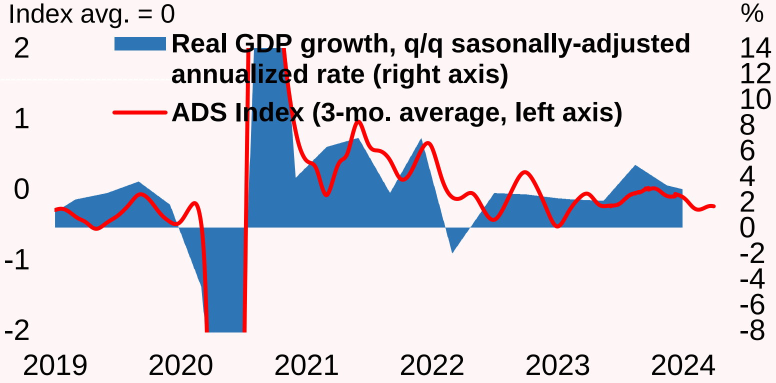
Industrial production edged up in Feb. 2024 and remained consistent with slow economy-side investment growth in Q1. Investment rose by 0.1% m/m in February per the Bureau of Economic Analysis.

Fed Funds rate and CCC and lower corporate bond yields



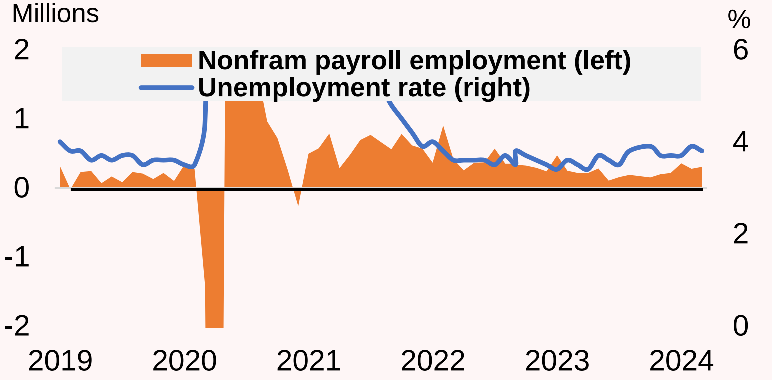
Increased bond premium for low credit quality. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. For the week ended Apr. 5, HY rates rose by 0.4% w/w to 13.3% while the Fed Funds futures held steady at 5.3%, boosting the premium for low credit quality above 8% for the first time since February.

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

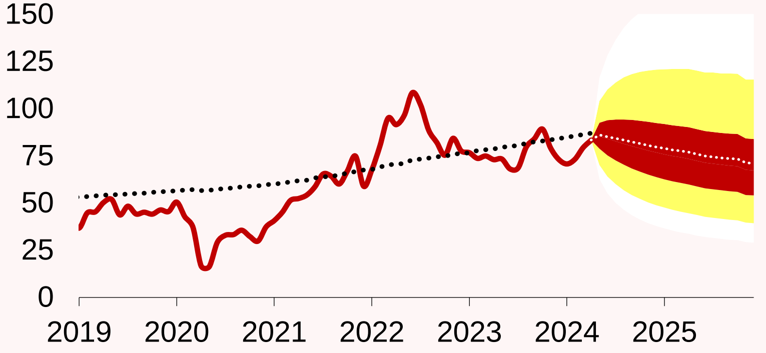


Higher unemployment rate despite payroll increases. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate fell by 0.1% m/m to 3.8% in March per BLS, while non-farm payrolls rose by 303,000.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

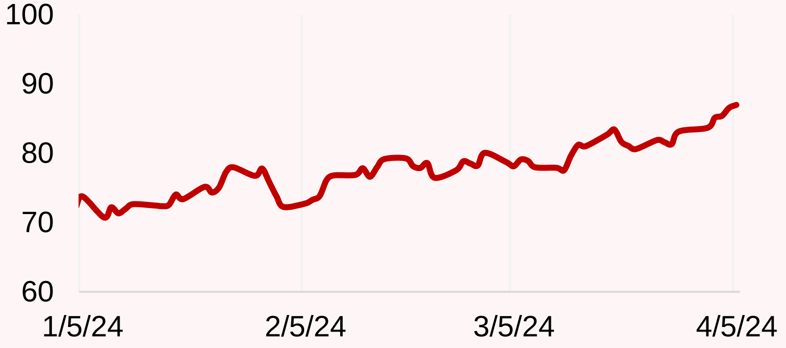
Dollars per barrel (2024$)



The historical mean reversion target has risen and currently exceeds near-term futures prices**.** 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

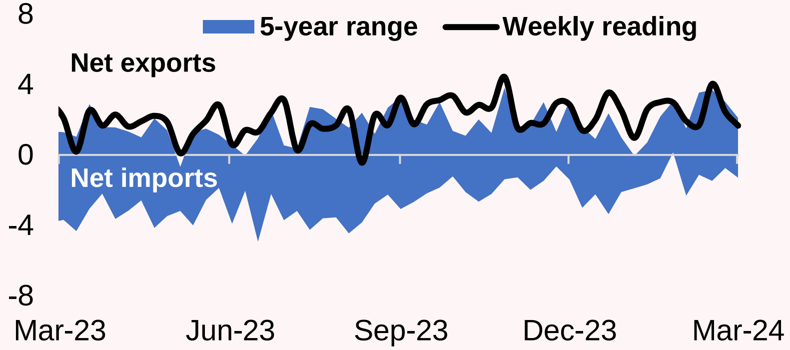
Dollars per barrel



WTI crude oil prices rose to $87 per barrel for the week ended Apr. 5, supported by a Middle East geopolitical premium and strengthened economic readings.

U.S. petroleum net exports (imports)

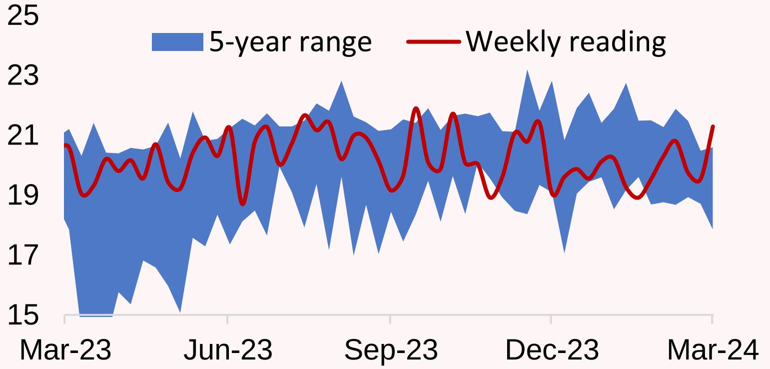
Million barrels per day, mb/d



Petroleum net exports fell. The U.S. was a petroleum net exporter of 1.7 mb/d for the week ended Mar. 29, down by 0.8 mb/d from the prior week.

U.S. petroleum demand

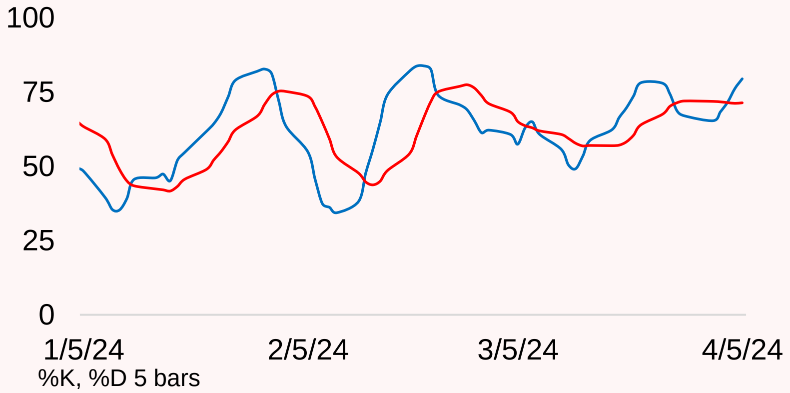
Million barrels per day (mb/d)



Petroleum demand increased. U.S. petroleum demand, as measured by deliveries, rose by 1.8 mb/d w/w to 21.3 mb/d for the week ended Mar. 29 – and exceeded the top of the 5-year range.

WTI crude prompt month futures slow stochastic

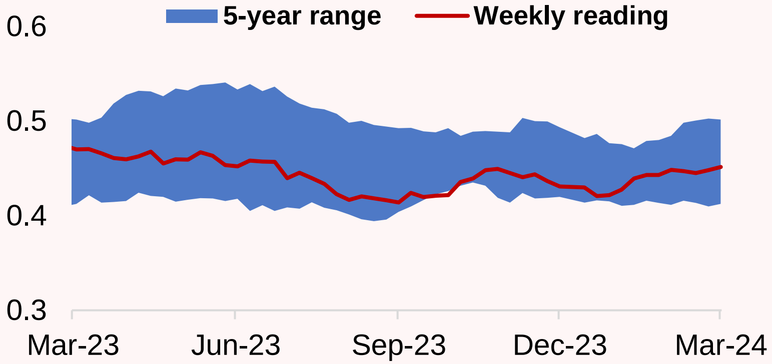
Index level



Price momentum held steady for the week ended Apr. 5.

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

Billion barrels

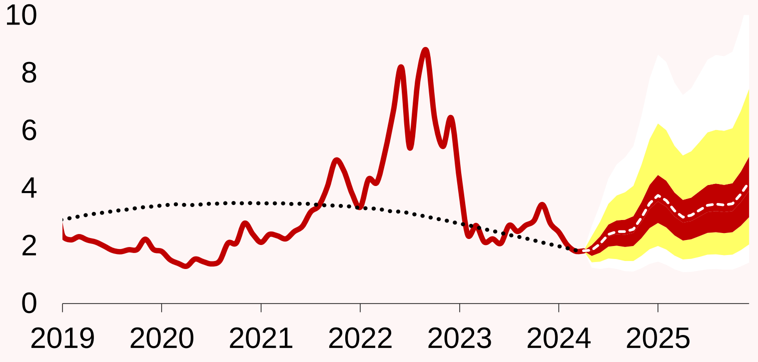


Inventories increased. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) increased by 3.2 million barrels (mb) for the week ended Mar. 29.

U.S. natural gas market indicators

Natural gas price mean reversion analysis

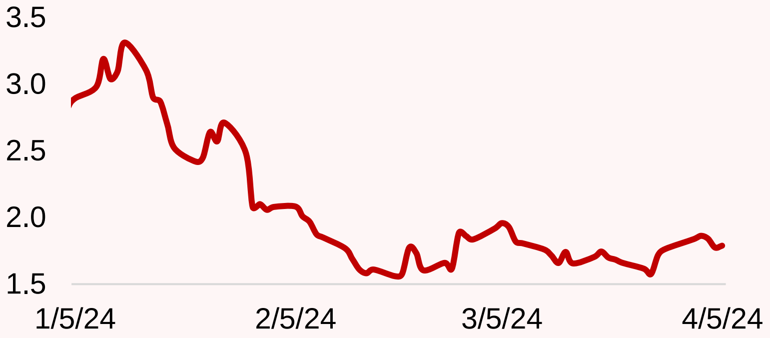
Dollars per mmBtu (2024$)



Natural gas futures prices progressively rise, despite low recent prices**.** Confidence intervals based on past prices show the potential for greater upside than downside.

Natural gas prompt month futures prices

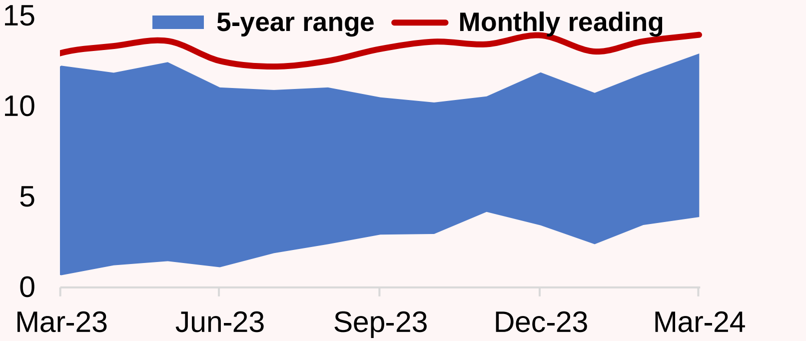
Dollars per million Btu



Natural gas prices at Henry Hub rose to $1.80 per million Btu for the week ended Apr. 5.

U.S. natural gas net exports

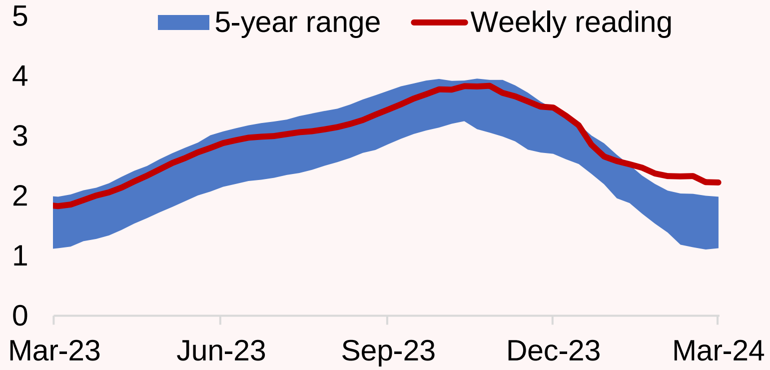
Billion cubic feet per day, bcf/d



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. weekly working gas storage

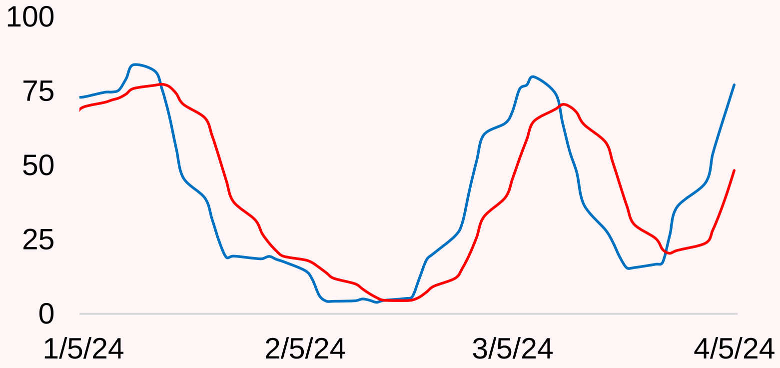
Trillion cubic feet (tcf)



Working gas in underground storage fell by 1.6% w/w to 2.26 tcf as of Mar. 29 but remained above the 5-year range.

Natural gas futures slow stochastic

Index level

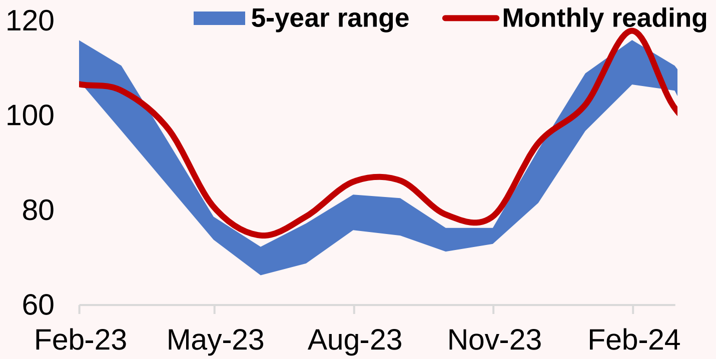


%K, %D 5 bars

Natural gas price momentum turned positive during the week ended Mar 28.

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

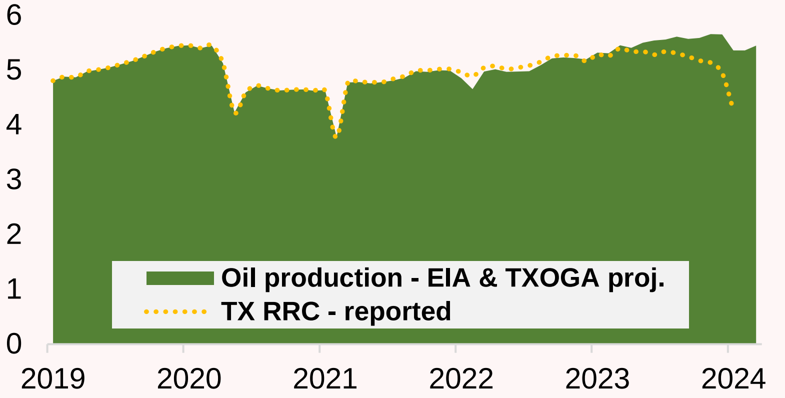


Consumption downgraded. EIA estimates that natural gas consumption fell from a record-high 118 bcf/d in January to 91.9 bcf/d in March, below the 5-year range with unseasonably warm weather.

Texas' oil and natural gas production

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

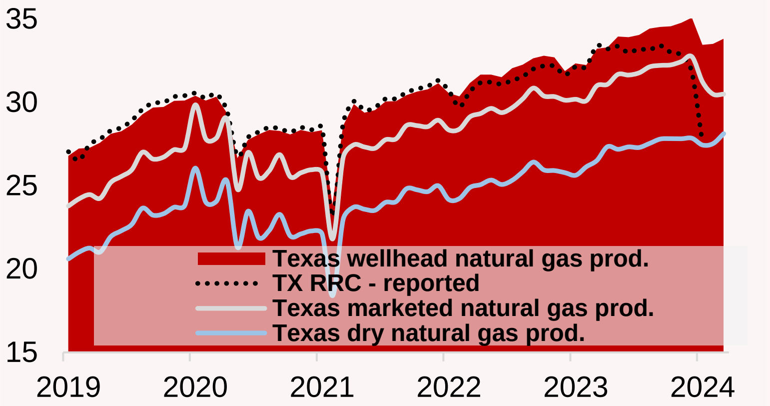
Million barrels per day (mb/d)



Oil production fell from record highs. Texas' oil production of 5.4 mb/d in January was impacted by Winter Storm Heather per EIA. TXOGA estimates that Texas crude oil production held steady at 5.4 mb/d in February and March 2024.

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

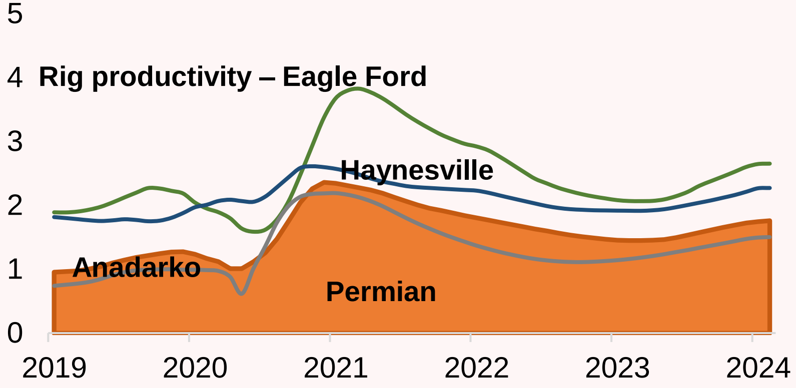
Billion cubic feet per day (bcf/d)



Natural gas production edged up. Texas' natural gas production of 33.5 bcf/d of gross withdrawals and 30.5 bcf/d of marketed production in Jan. were impacted by Winter Storm Heather per EIA.TXOGA estimates that production rose in March to 33.8 bcf/d of gross withdrawals, 30.5 bcf/d of marketed production, and 28.1 bcf/d of dry gas production.

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

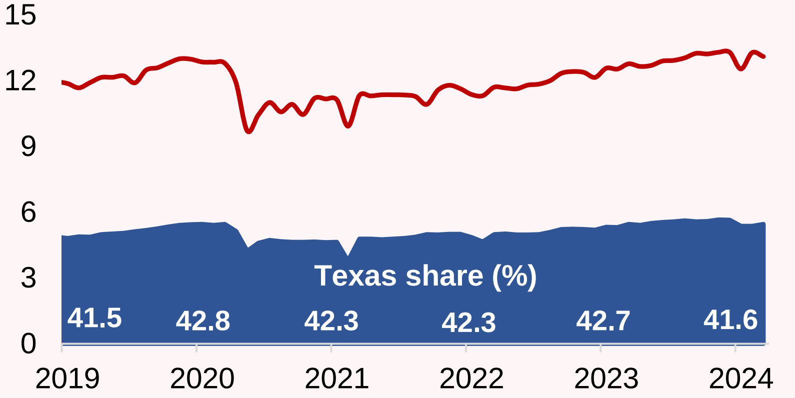
Thousand barrels per day oil-equivalent, kb/doe



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 – Mar. 2024

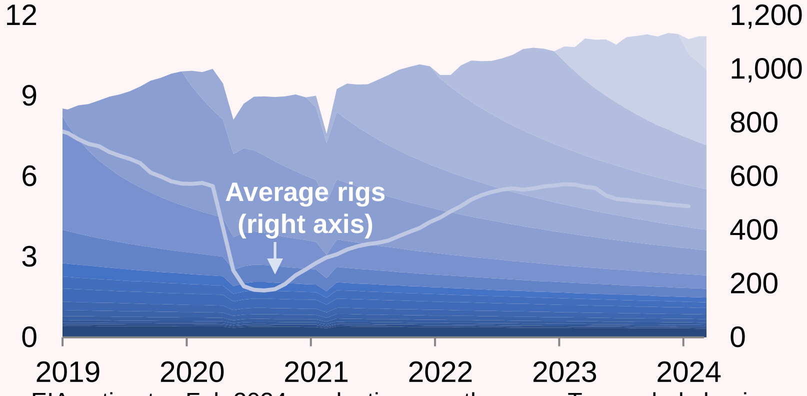
Million barrels per day (mb/d)



Texas' share fell. Texas accounted for an estimated 41.6% of U.S. crude oil production in Q1 2024.

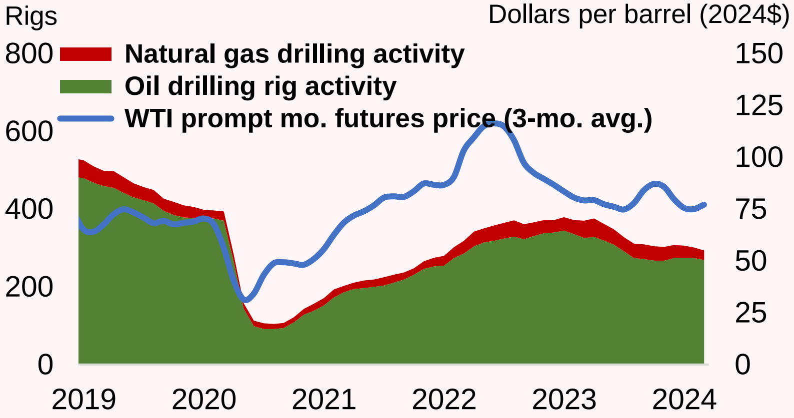
Texas shale basin wellhead oil & natural gas production

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



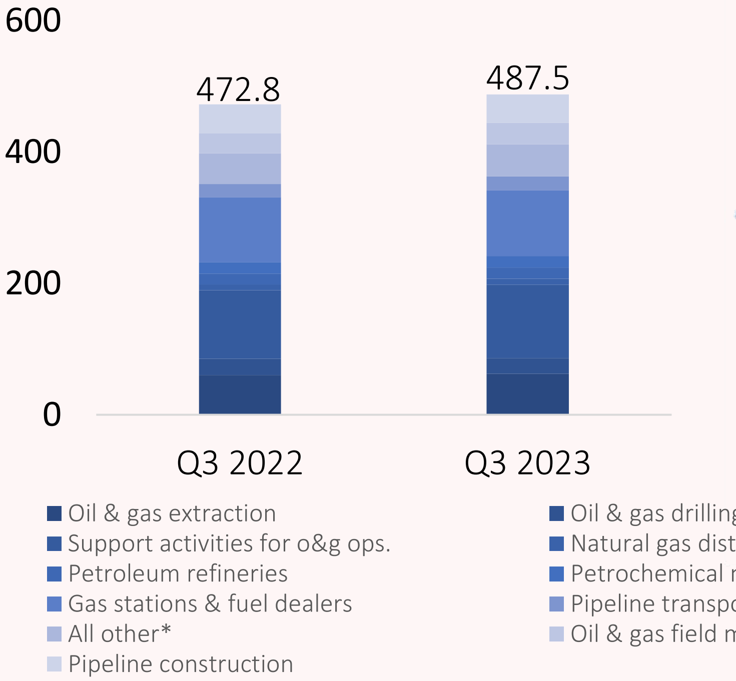
Texas' drilling rig activity remained decreased for the week ended Mar. 28 per Baker Hughes. Texas had 266 oil-directed rigs (down by 4 rigs w/w) and 24 natural gas-directed rigs (unchanged w/w).

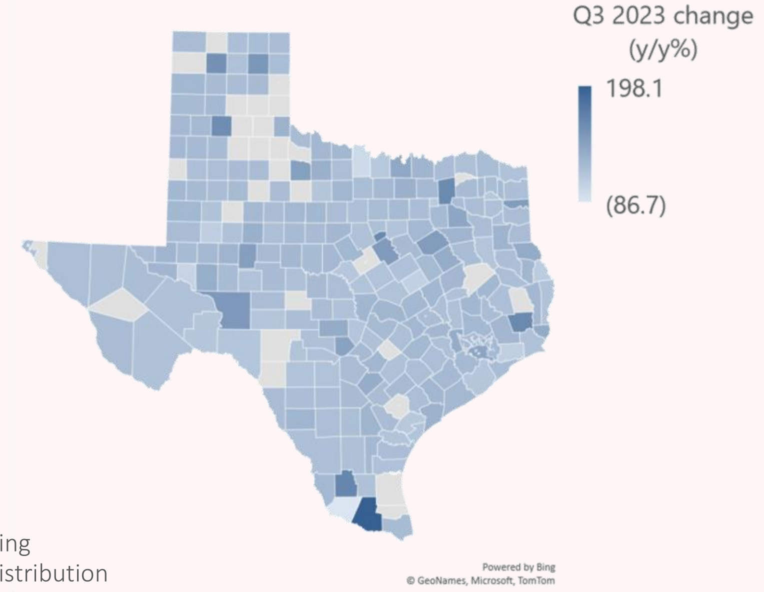
sources: U.S. Energy Information Administration; Texas Railroad Commission; Baker Hughes; CME Group; TXOGA analysis

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

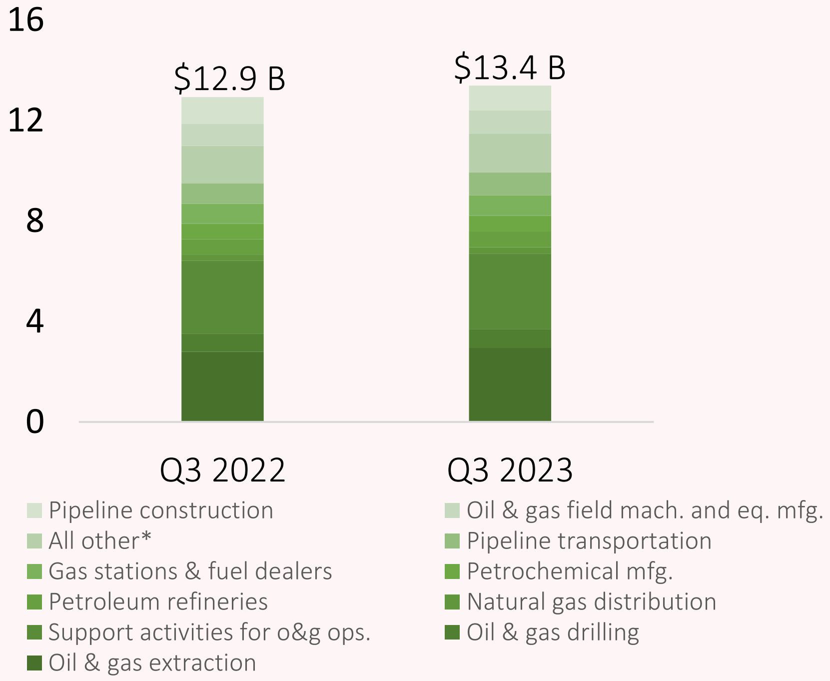
- Texas' oil and natural gas industry employment rose by 3.1% y/y in Q3 2023 with half of the job growth in upstream support services and another nearly 20% in oil & gas field machinery and equipment manufacturing, per data the latest data (released on Feb. 21, 2024) from the U.S. Census Bureau and Texas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





Texas oil and natural gas industry direct wages rose by +3.6% y/y in Q3 2023



* 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.

sources: U.S. Census Bureau; Texas Workforce Commission

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