



September 4, 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 September 4, 2023

- ▶ **U.S. economic outlook appears solid.** The Bureau of Economic Analysis' August real GDP revision for Q2 2023 showed growth of 2.5% y/y. The University of Michigan survey's final reading of U.S. consumer sentiment for August was on par with that in July, which was its highest since October 2021. The Philadelphia Federal Reserve Bank's ADS business conditions index continued to show increased support for GDP growth in Q3 2023. The interest rate premium for below investment grade credit quality fell to its lowest level since January 2022.
- ▶ **Oil market fundamentals tightened.** U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) fell by 10.6 million barrels (mb) for the week ended Aug. 25 to the lowest 20% of the 5-year range, per the U.S. Energy Information Administration ([EIA](#)). Texas crude oil production was 5.5 million barrels per day (mb/d) in June per EIA, and TXOGA estimates that it rose to a record 5.7 mb/d in August (see the [Chart of the Week](#)).
- ▶ **U.S. natural gas storage remained strong despite record high exports.** Working gas in underground storage (3.1 tcf as of Aug. 24) remained near the top of its 5-year range as the injection rate of 1.0% w/w rebounded. Storage remained historically strong even though U.S. natural gas net exports of 13.7 bcf/d in August are estimated by EIA to have set a new record high.

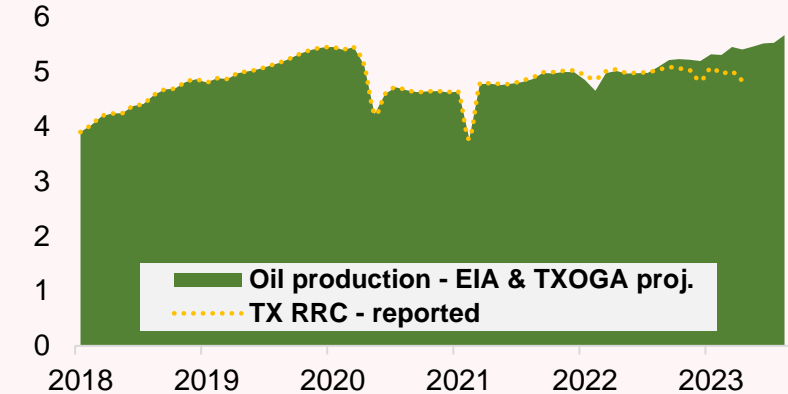
TXOGA Chart of the Week: Texas oil and natural gas production

Texas established new production records

- For June 2023, as published by EIA on August 31, Texas' crude oil production of 5.5 mb/d and natural gas gross withdrawals of 33.9 billion cubic feet per day (bcf/d) both set new record highs
 - The 5.5 mb/d of crude oil production in June matched TXOGA's estimate.
 - The 33.9 bcf/d of natural gas gross withdrawals exceeded TXOGA's estimate by 1.1%.
- For August 2023, TXOGA estimates additional production records:
 1. Texas' crude oil production rose to 5.7 mb/d; and,
 2. Natural gas production rose to 34.1 bcf/d of gross withdrawals in August, including 30.9 bcf/d of marketed production, 26.35 dry gas production, and field production of 3.2 mb/d of natural gas liquids (NGLs).

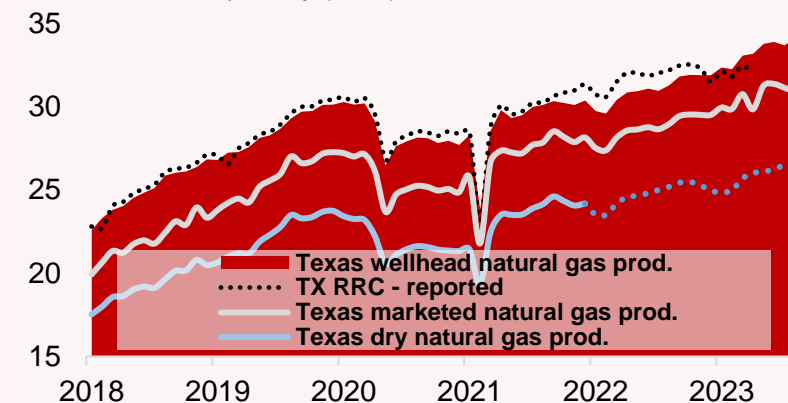
Texas crude oil production, Jan. 2018 – Aug. 2023

Million barrels per day (mb/d)



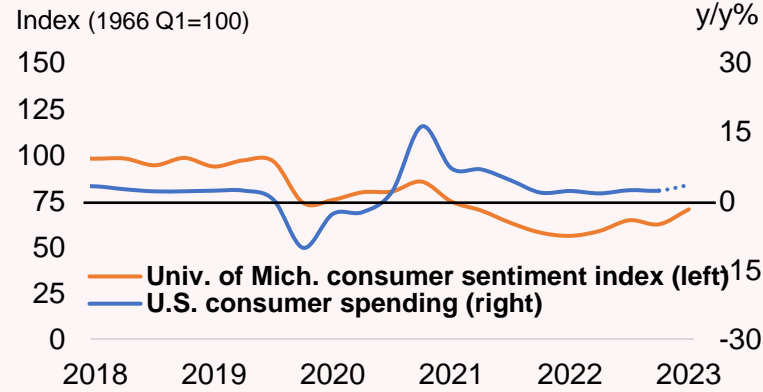
Texas natural gas production, Jan. 2018 – Aug. 2023

Billion cubic feet per day (bcf/d)



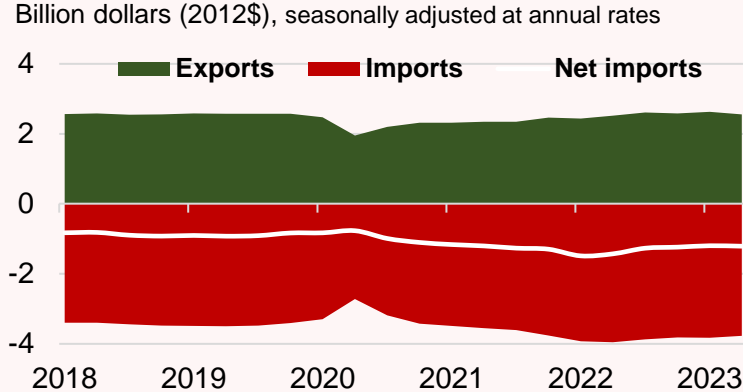
U.S. economic indicators

Consumer sentiment vs. spending



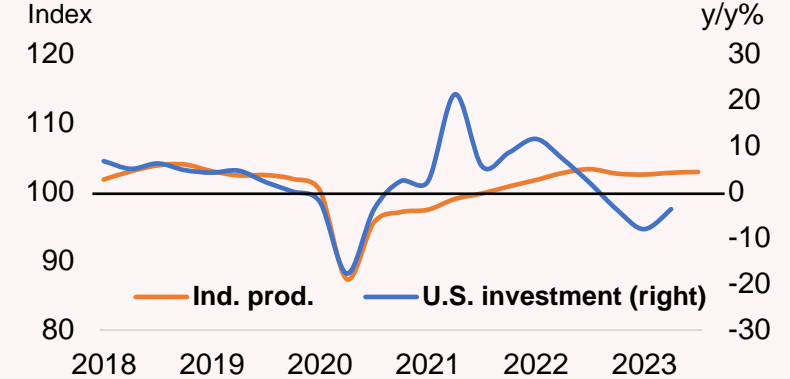
Consistent held steady. The Univ. of Michigan's survey of consumers has historically corresponded with changes in U.S. consumer spending, which represents 68% of GDP, and the index's final August reading of 69.5 was on par with its July level, which was the highest since Oct. 2021.

Real net exports of goods and services



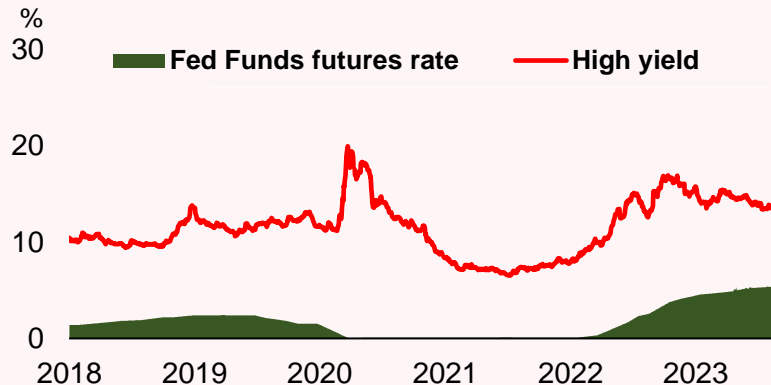
The U.S. trade deficit for Q2 2023 revised to be wider. The U.S. real trade deficit ran at an annualized rate of \$1.212 trillion, up from a revised \$1.20 trillion in Q1. If sustained for the year, this represents the third straight year of trade deficits exceeding \$1.2 trillion.

Industrial production and investment growth



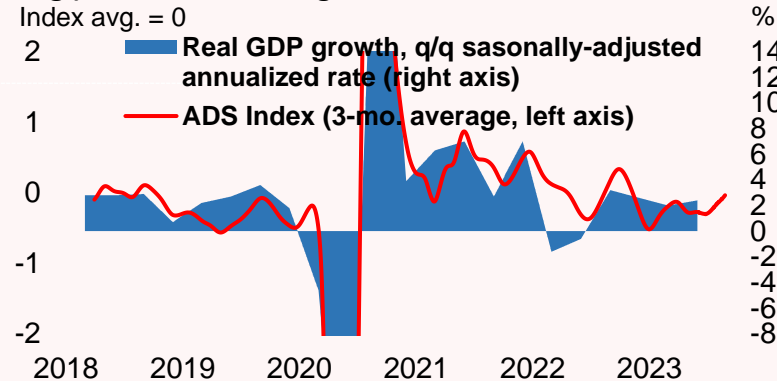
Industrial production and capacity utilization rose in July. Industrial production growth increased to 1.2% y/y in July along with a capacity utilization rate of 79.3%, which has historically corresponded with U.S. investment growth.

Fed Funds rate and CCC and lower corporate bond yields



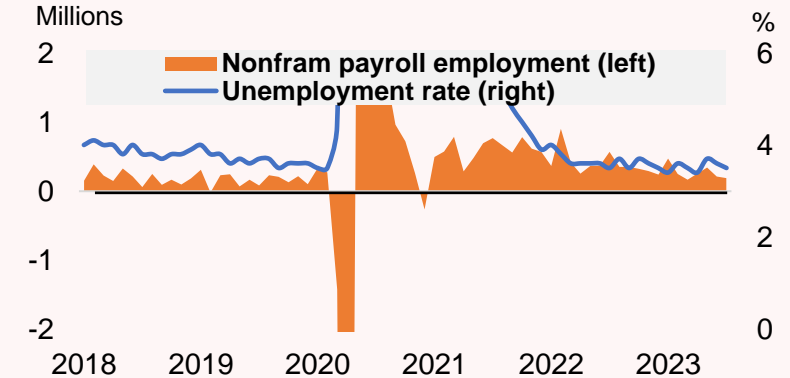
Low credit quality premium fell. High yield (HY) rates reflect debt costs for firms with below-investment grade credit quality. HY rates fell by 20 basis points w/w to 13.38% on Aug. 31, while the Fed Funds futures rate edged down to 5.36%. The premium for low credit quality fell to 8.0% as of Aug. 30, its lowest since January 2022.

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



Improved 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 risen from negative readings so far in 2023 to above zero, which historically corresponds with GDP growth.

Nonfarm payroll employment & unemployment rate

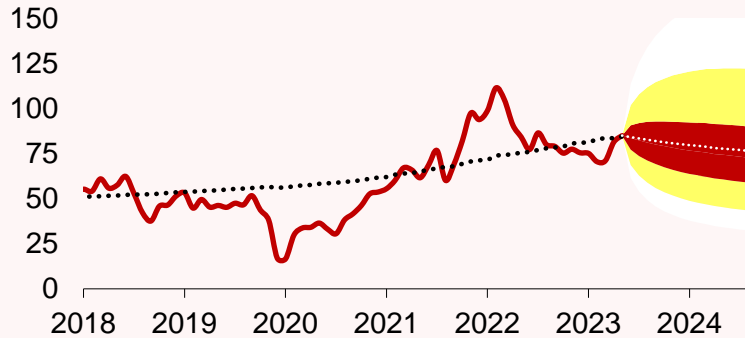


The unemployment fell in July, even as payroll growth slowed. The employment situation is a lagging indicator of GDP growth. The U.S. unemployment rate fell to 3.5% in July per BLS, while non-farm payrolls rose by 187,000, which was the lowest monthly increase since Dec. 2019.

U.S. oil market indicators

WTI crude oil price mean reversion analysis

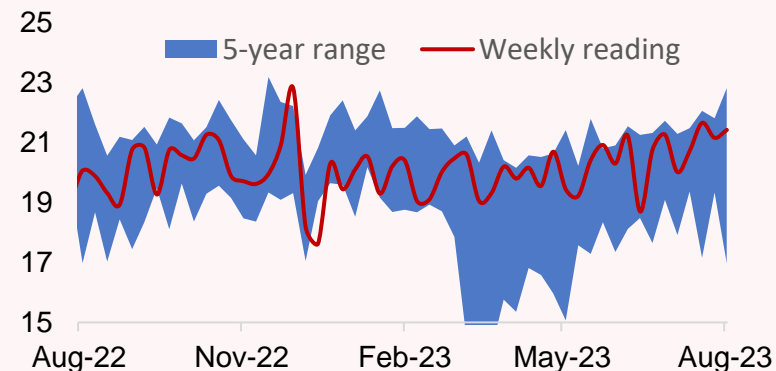
Dollars per barrel (2023\$)



Prices remained aligned with the MR historical target. Mean reversion analysis can be useful in to assess short-term market actions. Futures prices remain slightly backwardated, and confidence intervals based on past prices show the potential for greater upside than downside.

U.S. petroleum demand

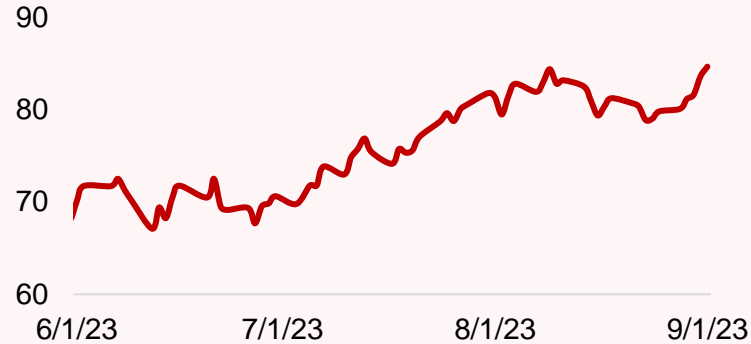
Million barrels per day (mb/d)



Strong petroleum demand. U.S. petroleum demand, as measured by deliveries, of 21.4 mb/d for the week ended Aug. 25 – within the top 25% within its five-year range.

WTI crude prompt month futures prices

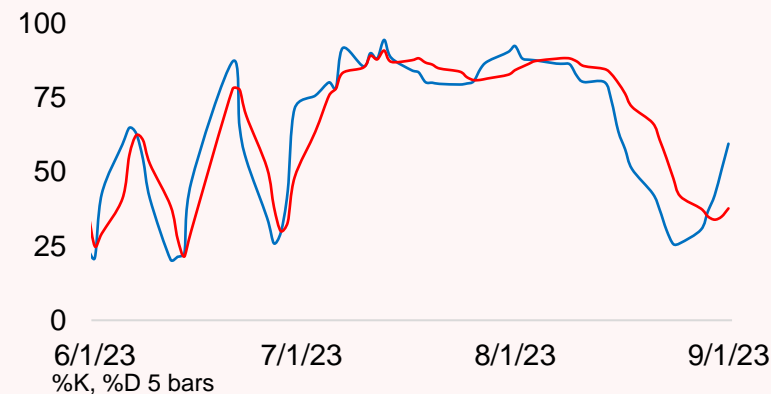
Dollars per barrel



Following steady economic readings and the historically large U.S. crude oil inventory drawdown, WTI crude oil prices rose by 6.1% w/w to \$84.67 per barrel for the week ended Sep. 1.

WTI crude prompt month futures slow stochastic

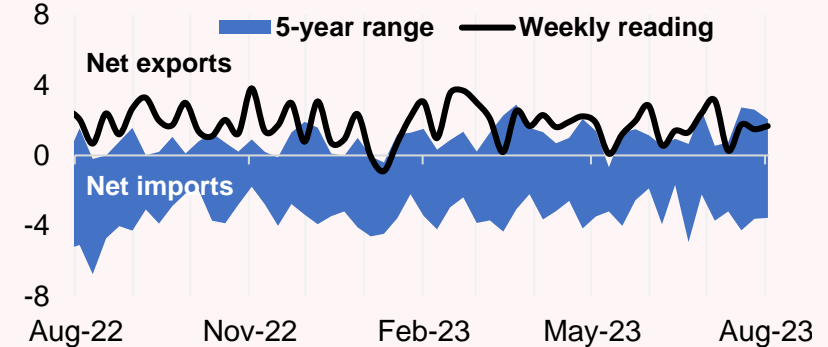
Index level



Oil price momentum turned positive during the week ended Sep. 1.

U.S. petroleum net exports (imports)

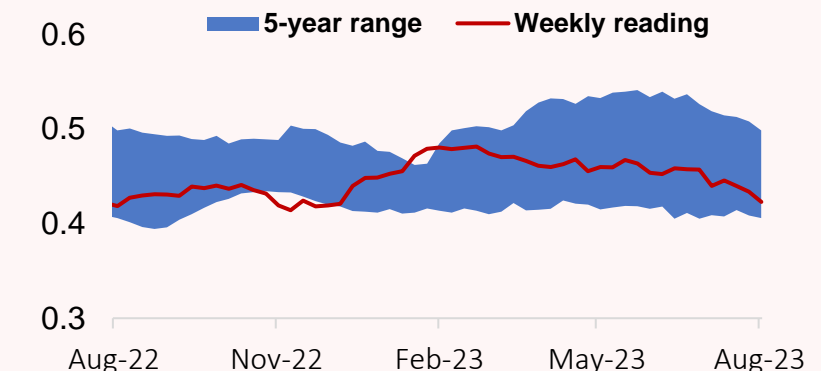
Million barrels per day, mb/d



U.S. petroleum trade surplus strengthened. The weekly U.S. petroleum trade balance of 1.7 million barrels per day (mb/d) rose by 0.3 mb/d from the prior week. Lower crude oil net imports were the main driver of the weekly change.

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

Million barrels (mb)

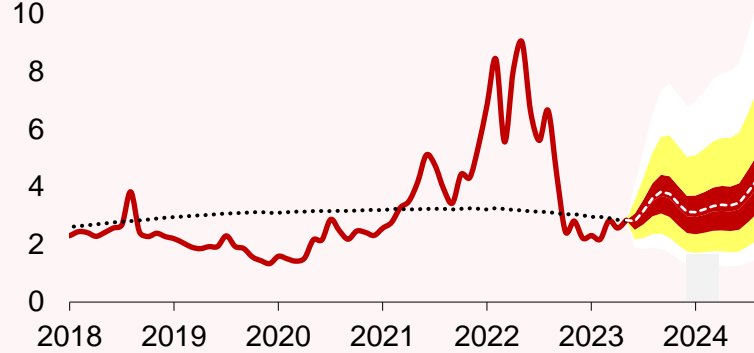


Inventories dropped. U.S. ending stocks of crude oil excluding the Strategic Petroleum Reserve (SPR) fell by 10.6 million barrels (mb) for the week ended Aug. 25 to the lowest 20% of their 5-year range.

U.S. natural gas market indicators

Natural gas price mean reversion analysis

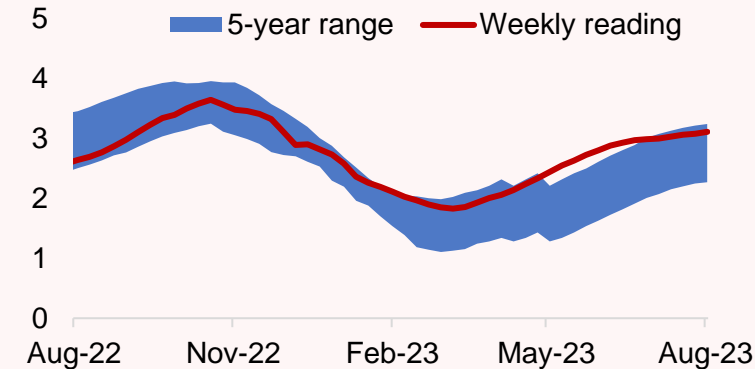
Dollars per mmBtu (2023\$)



Natural gas futures prices of \$2.82 per mmBtu for October 2023 delivery (rising to \$3.84 per mmBtu for Jan. 2024 delivery) were in line with their mean reversion target. Historical variation has continued to show more potential upside than downside.

U.S. weekly working gas storage

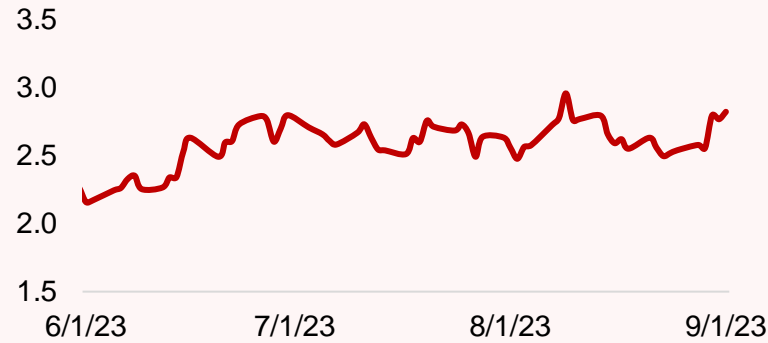
Trillion cubic feet (tcf)



Storage levels remained strong. Working gas in underground storage (3.1 tcf as of Aug. 24) remained near the top of its 5-year range as the injection rate of 1.0% w/w rebounded.

Natural gas prompt month futures prices

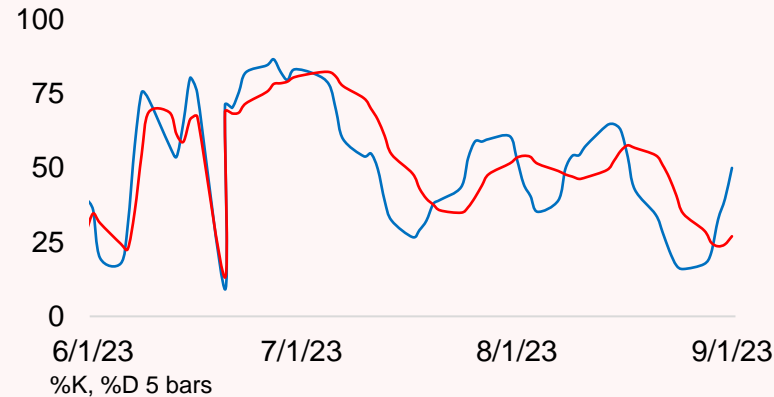
Dollars per million Btu



Natural gas month 1 futures prices at Henry Hub rose by 11.1% w/w to \$2.82 per mmBtu as of Sep. 1, reflecting seasonal variation in advance of the shoulder season before winter.

Natural gas futures slow stochastic

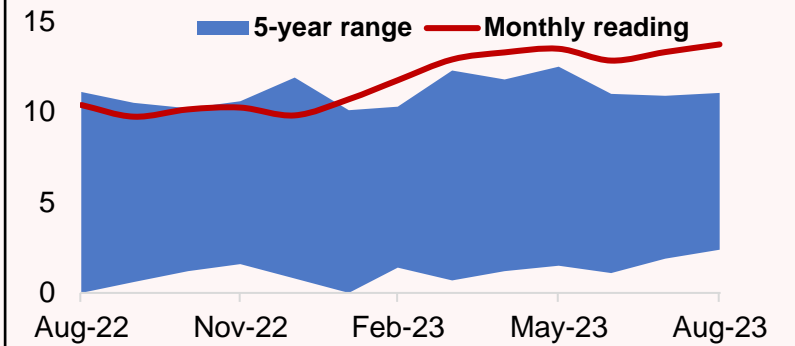
Index level



Natural gas price momentum turned positive during the week ended Sep. 1.

U.S. natural gas net exports

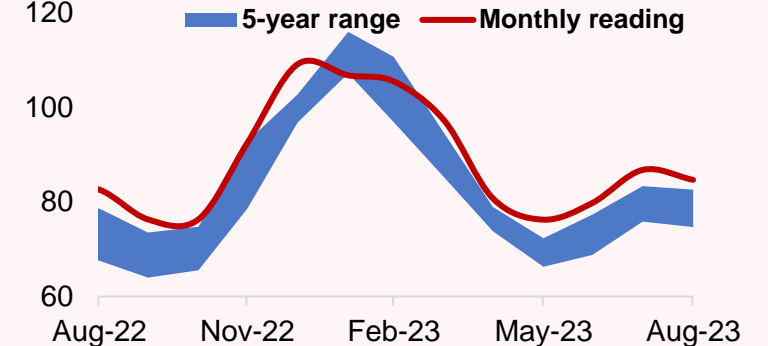
Billion cubic feet per day, bcf/d



Record-high exports. U.S. natural gas net exports of 13.7 bcf/d in August are estimated by EIA to have set a new record high.

U.S. natural gas consumption

Billion cubic feet per day, bcf/d

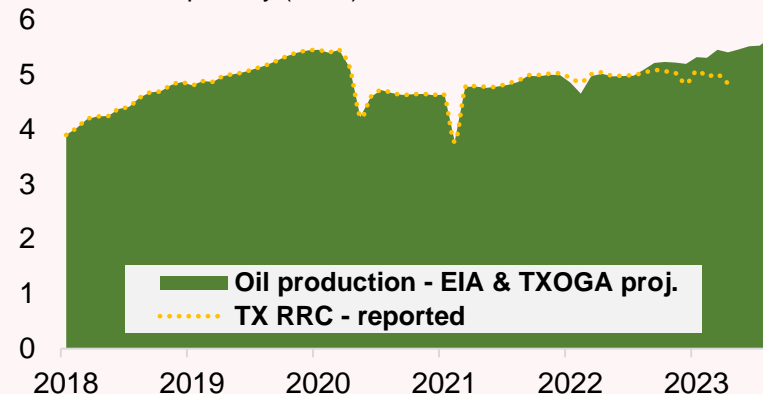


Strong consumption. Natural gas total consumption continued to exceed its five-year historical range in August 2023 and has provided 44.8% of U.S. electricity generation so far this summer per EIA.

Texas' oil and natural gas production

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

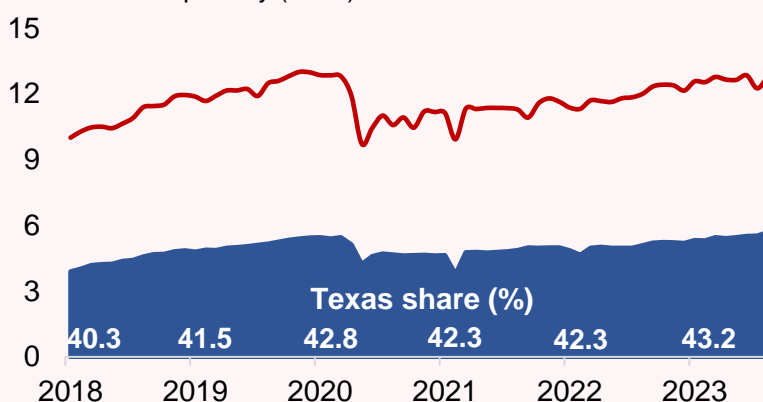
Million barrels per day (mb/d)



Record Texas oil production of 5.5 mb/d for June was reported by EIA for June. Based on weekly Texas drilling activity and U.S. production, TXOGA estimates that Texas crude oil production remained at 5.5 mb/d in July and rose to another record high of 5.7 mb/d in August.

U.S. and Texas crude oil production, Jan. 2018 – Aug. 2023

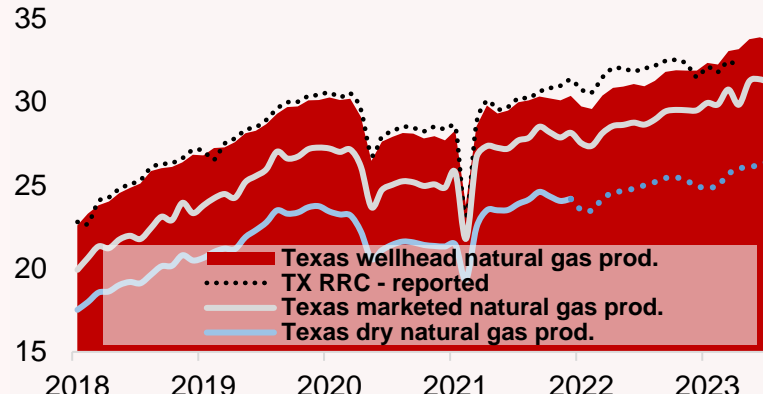
Million barrels per day (mb/d)



Through the first eight months of the year, Texas accounted for 43.2% of U.S. crude oil production. Based on TXOGA's projection that Texas production grew to 5.7 mb/d in August.

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

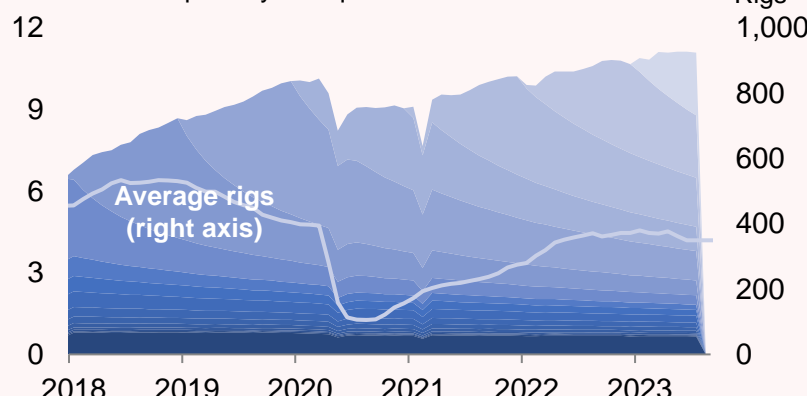
Billion cubic feet per day (bcf/d)



For June, EIA reported record gross withdrawals of 33.9 bcf/d and marketed production of 31.4 bcf/d. For August, TXOGA estimates that Texas produced another 34.1 bcf/d of gross production, including 30.9 bcf/d of marketed production, 26.35 dry gas production, and 3.2 mb/d of natural gas liquids (NGLs).

Texas basin wellhead oil & natural gas production

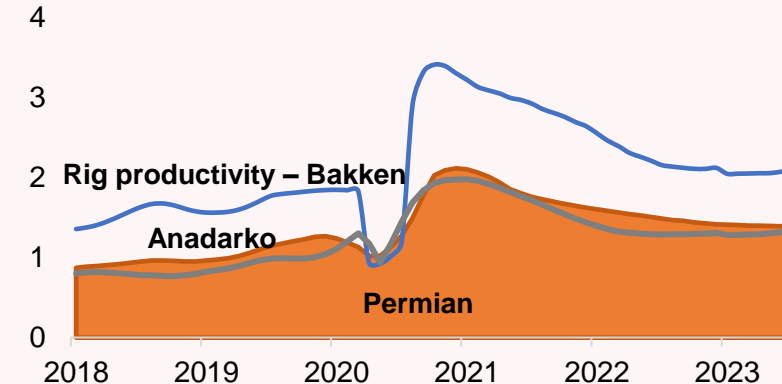
Million barrels per day oil-equivalent



EIA's drilling productivity report estimates that production across Texas shale basins -- Eagle Ford and parts of the Permian, Hayessville, and Anadarko -- reached a record high in June 2023 but slipped by 0.7% from record levels as of August 2023.

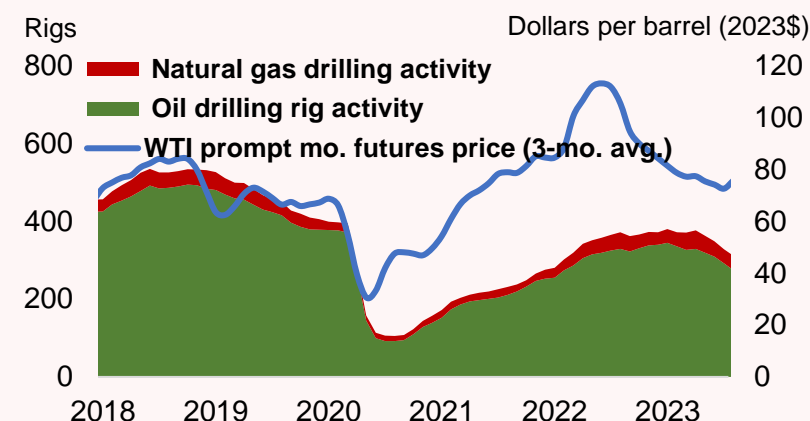
Rig productivity by basin – new per prod. per month

Thousand barrels per day oil-equivalent, kb/doe



EIA estimates that rig productivity for August 2023 increased by 6.5% y/y in the Anadarko basin but decreased by 4.7% y/y in the Permian Basin. On average across oil-producing basins, productivity remains 18.9% above pre-pandemic levels from Dec. 2019.

Texas drilling activity and WTI crude oil futures prices



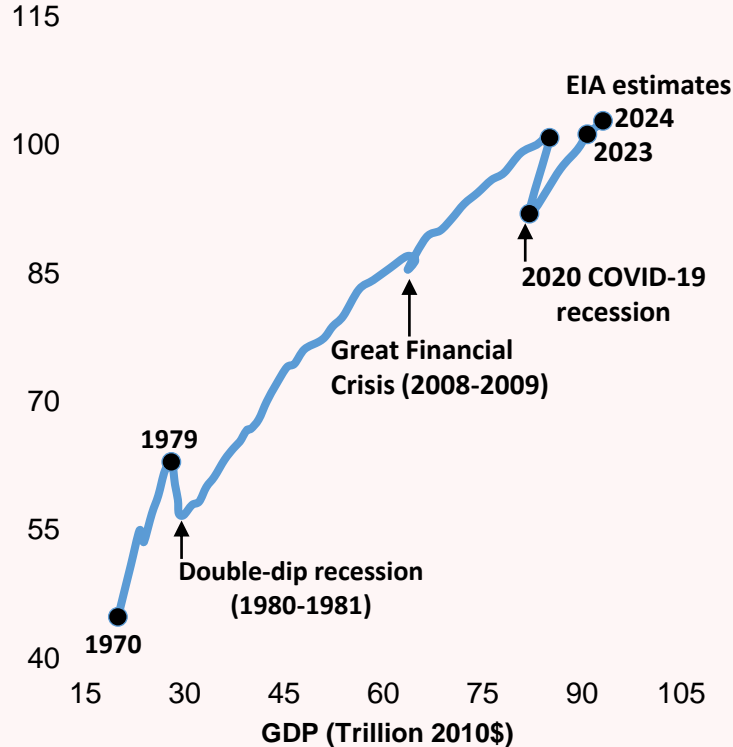
Texas' drilling rig activity decreased by 5 rigs for the week ended Aug. 25 per Baker Hughes – and fell by 70 rigs or 18.6% since the end of April. Last week, Texas had 271 oil-directed rigs and 36 natural gas-directed rigs.

Global oil market balance at-a-glance

- **August demand projections held steady.** Global oil demand is expected by EIA to reach a record 101.2 mb/d in 2023 and 102.8 mb/d in 2024.
- **EIA raised its oil production growth** projections by +0.1 mb/d to 1.4 mb/d in 2023 and +0.2 mb/d to 1.7 mb/d in 2024. These are volumes needed to balance global markets in their view. The U.S. is assumed to be largest single contributor this year
- **For global oil inventories, EIA revised its projections to show net stock draws through year-end 2023,** corresponding with Brent crude oil prices of \$84 per barrel in Q3, \$88 per barrel in Q4, and then easing in 2024 with a more balanced market in their view

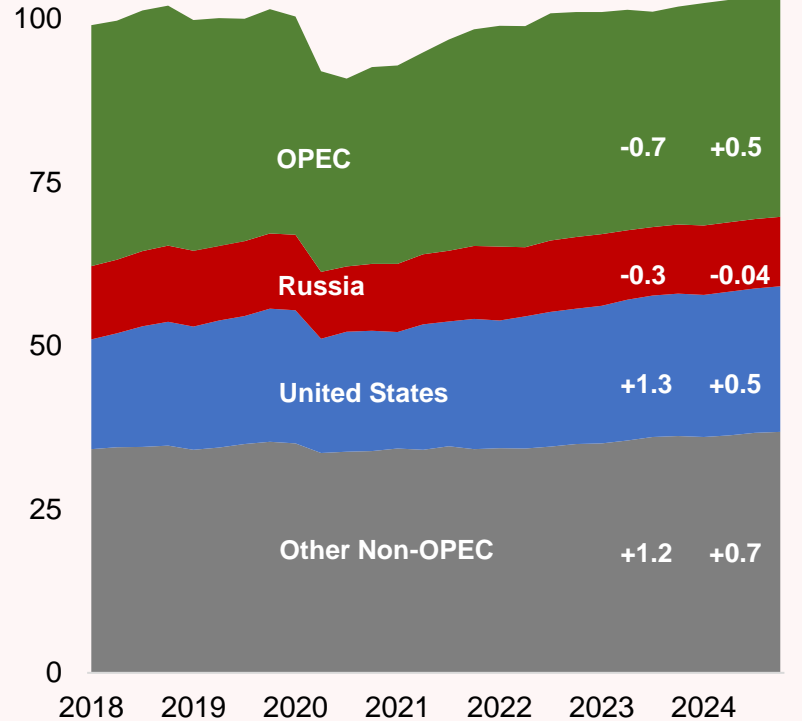
Global oil demand and GDP

Million barrels per day (mb/d)



Oil production by country/region

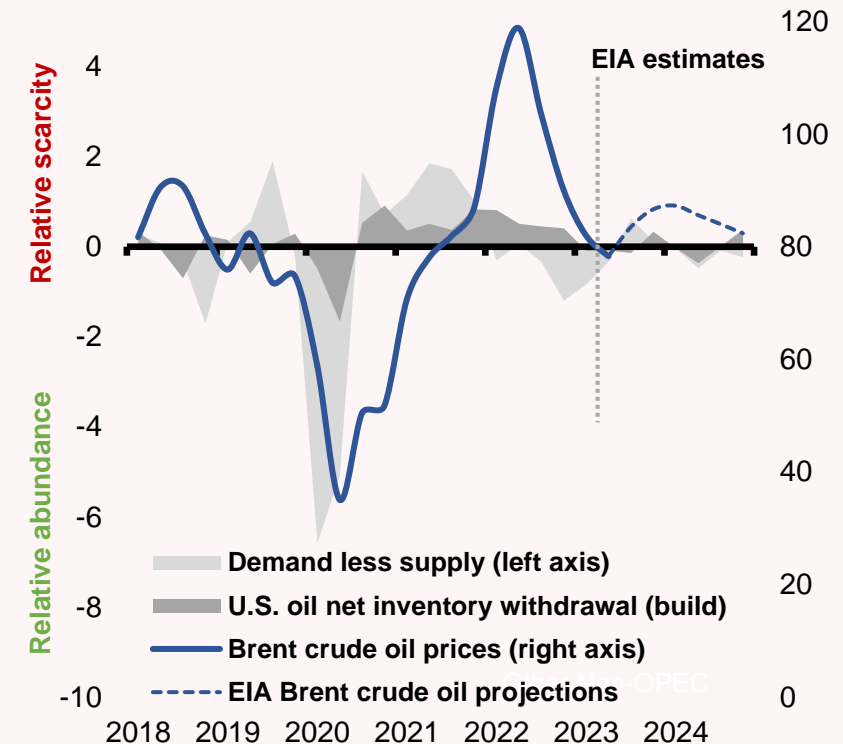
Million barrels per day, mb/d



Global demand/supply & Brent prices (July 2023)

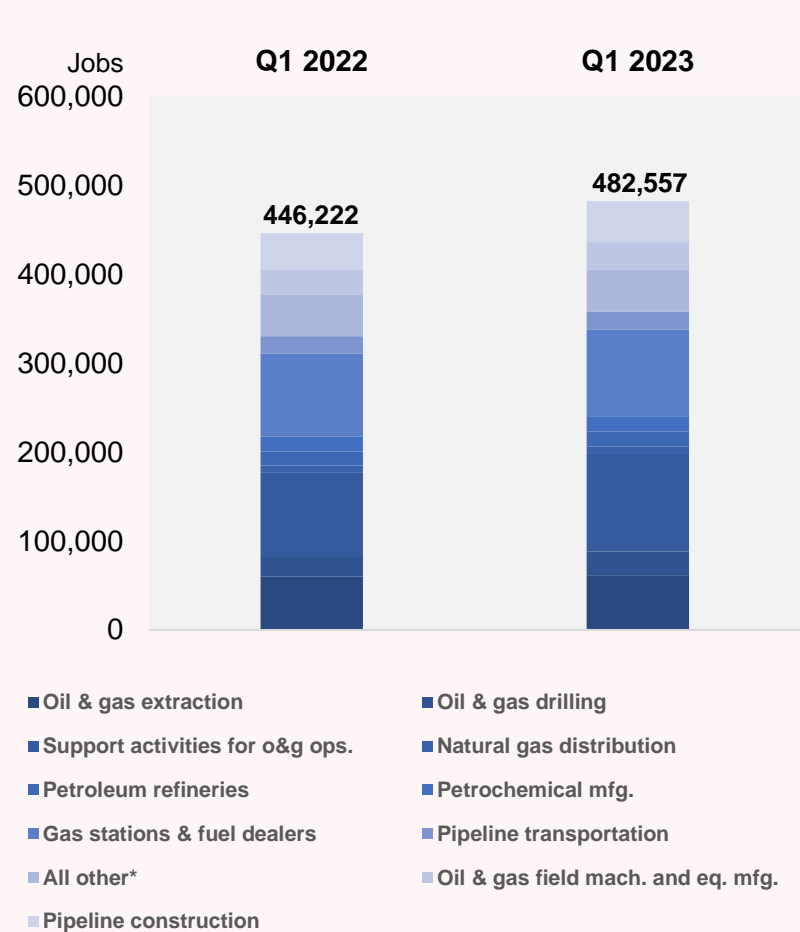
Million barrels per day (mb/d)

2023\$/Bbl

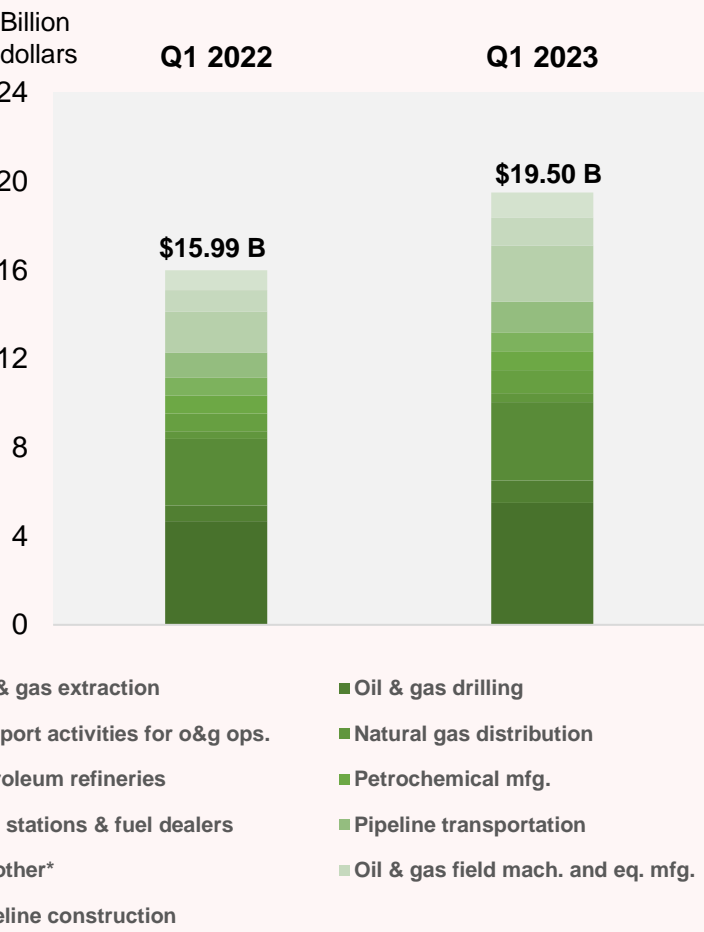


Texas' oil and natural gas industry employment and wages rose strongly

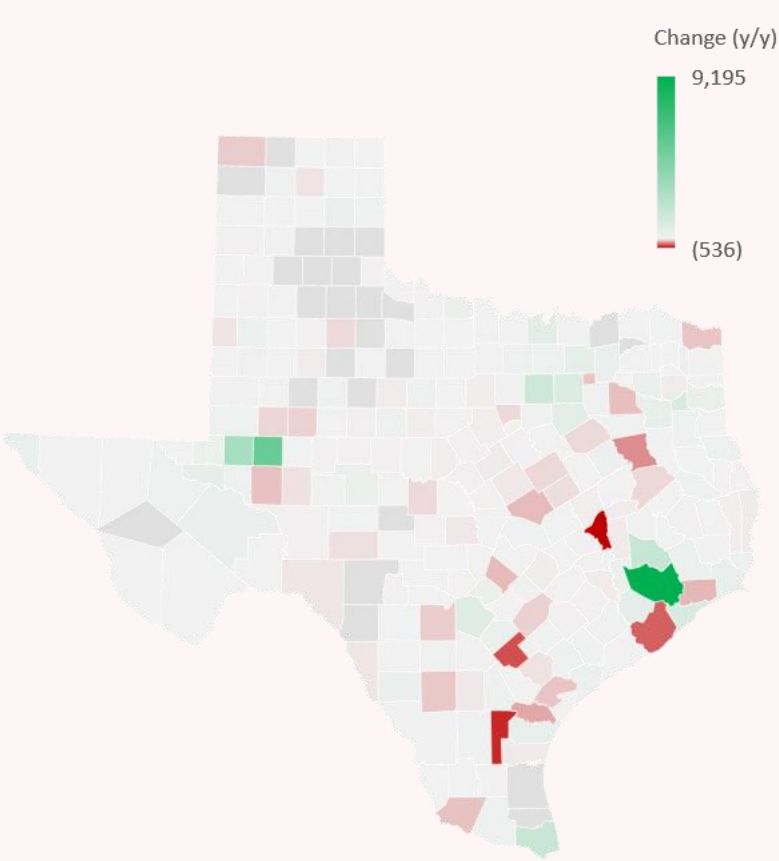
Texas Oil & Gas Industry Employment Rose by +8.1% y/y



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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